Docket 24783: Propane Powered Type D School Bus
Blue Bird Corporation

APPLICANT INFORMATION

Primary Contact: Steve Whaley, Alternative Fuels Manager
Organization: Blue Bird Corporation
Email: stephen.whaley@blue-bird.com
Phone: 478-822-2253
Amount Requested: $ 2,400,000
Total Project Cost: $ 10,200,000

Start Date: 08/01/2025
End Date: 06/30/2027
Additional Vendors: ROUSH CleanTech; Todd Mouw, Executive VP

EXECUTIVE SUMMARY

Funding Request Priority Area

Technology Development and Commercialization

Project Summary

- *Briefly describe the proposed product or idea, its importance, its benefits, and the market and/or audience it serves. Briefly outline the scope of work.*

The proposed product is a Blue Bird Type D-RE (Rear Engine) bus powered by a Ford engine and a ROUSH CleanTech propane fueling system. Since 2012, the propane industry has experienced consistent annual growth in the bus transportation markets which consists primarily of school buses. The overall growth, expansion, and success is due in large part to the Blue Bird and ROUSH CleanTech partnership which has produced sales in excess of 20,000 Type A and C propane autogas buses. The school transportation industry is adopting propane autogas at a consistent and sustained annual pace which includes a high population of repeat buyers as well as new adopters. Unfortunately, there is a segment of the bus industry that cannot be served by the current offerings – school districts requiring a Type D propane autogas bus. This project will capitalize on the overall success in Type C market and take advantage of the pent-up demand for propane autogas in Type D transit school bus fleets ultimately increasing gallons sales of propane autogas in an industry cornerstone market.

After conducting extensive market research, Blue Bird found that many school bus fleets, which are predominantly Type D, have strong interests in propane autogas but cannot convert their fleets to operate solely with the Type C propane autogas school bus. Type D buses provide higher ridership capacities than Type C and fleets cannot afford to purchase more Type Cs to handle the student ridership that is currently transported with the transit style bus. And of equal importance to these fleets, transit style buses have shorter wheelbases which are required to maneuver in urban and metro routes where Type C buses cannot operate.

From a budget perspective, switching from Type D to Type C buses would have an immediate negative impact by dramatically increasing a school's annual budget. Budget impacts include, but are not limited to, an increase

in annual bus purchases, hiring additional drivers, increases in title, registration and insurance costs, changes in routing and increased maintenance, inspections and repairs costs. The increase in budget would prohibits sales to those Type D fleets that want to convert to propane.

Blue Bird forecasts an initial conservative volume of 1,000 Type D propane buses which would provide the propane industry an opportunity of over 47M gallons over the life of these units. It is expected that Blue Bird, along with other OEMs, will discontinue the use of diesel engines in Type D products as early as 2027. At that point, Blue Bird's only ICE offering will be a propane engine. Because of the industry wide shift to alternative fuels and the strong benefits associated with the Type D product and fuel-type, Blue Bird projects the market potential exceeds 1,400 buses annually. Over five years, more than 6,400 units could be delivered which would represent over 300M incremental gallons over the lifecycle of these units.

From a strategic growth perspective, it is anticipated that other players in this space will be persuaded to develop and commercialize a propane autogas Type D bus offering for their brand loyal customers or risk losing valued customers in a finite market to Blue Bird. The propane industry witnessed this change in strategy with the Type C bus which has translated into nearly 1,000 annual bus sales for these companies collectively.

The addition of a Blue Bird Type D propane powered bus would expand the already successful propane bus offerings from Blue Bird. Blue Bird currently offers a Type D-EV today, but cannot meet the needs of a large segment of the industry due to range and affordability of that product. A propane powertrain compliments the Type D-RE platform in nearly every way with the main advantages being cost of operation, maintenance and drivability. The lower cost of operation gained by using LPG fuel strongly compliments the cost per passenger message of higher capacity D-RE. The estimated cost per unit would be $145,000 - $155,000, an approximate $15,000 - $25,000 increase over a Type C propane bus, and includes significant enhancements to passenger capacity, serviceability, safety, and maneuverability. The Type D-RE platform will offer a higher ridership capacity than the Type C by an additional 13 passengers or 90 passenger total.

The LPG version will offer a nostalgic return to basics giving technicians greatly needed relief by eliminating emission systems and ancillary engine devices that need to be serviced and maintained. With the engine located in the rear engine compartment, it will be extremely quiet inside the cabin, especially in the driver compartment area, providing an improved driver experience and increased safety due to the ability to better hear the students and traffic.

The type D-RE offers inherent safety features which are paramount when transporting school children; the flat, no hood, design allows for unparalleled driver visibility in crossing and loading zones. Pulling into the loading zone is also safer as the design features the passenger loading door ahead of the front axle which is reversed on the Type C. The Type D RE also offers improved maneuverability to the Type C allowing use in tight areas and cul-de-sacs. It also offers improved serviceability with easy access to the engine through the rear engine compartment door.

This product is directed at markets in the United States and Canada with main focus on school districts and school bus contractors. A secondary focus will be non-school bus (commercial bus) markets within the US and Canada which include; national parks, municipalities, universities, prison transport, GSA, airport shuttle, etc.

This projects scope of work will include outlining the design concept, determining performance targets, building a prototype, completing testing, finalizing build specifications, obtaining emission certifications, training and marketing of the product, building pilot units and launching final production units.

Strategic Importance

- *Describe how this initiative supports PERC's strategic plan including the strategic pillars.*
- *Describe how this initiative is important to the propane industry.*
- *Describe how this initiative helps achieve PERC's aspiration to increase uses and users.*
- *Explain why this docket is critical to achieving your goal.*

PERC's strategic objective of increasing uses and users is met with the addition of a Type D school bus operating on propane. Nearly half of all the autogas gallons sold last year were consumed by Type C school buses, and the addition of a higher fuel consumption vehicle through the Type D platform will add significant gallons to the autogas market. This $2.4 million investment would return $134,000,000.00 for propane marketers selling autogas and $2,238,000.00 to PERC.

Propane marketers will find it extremely difficult to find new automotive segments that can equal or surpass the projected success of the Type D propane school bus segment. It would require tremendous effort to learn new fleet segments, build interest from fleets, and evangelize new markets. Since the Type D-RE project will be marketed through existing experienced sales channels with proven success, propane marketers will easily reap the benefits of growth in this market.

DETAILED BUSINESS CASE

Scope–

- *List the activities paid for by this docket only (research, consultants, sponsorships, etc.)*

This docket will pay for a portion of the total project costs; Blue Bird's team has conducted extensive market research over the last several years to evaluate the market demand and feasibility of offering a propane engine in a Type D product. Blue Bird has evaluated and analyzed both the Type D Front Engine and Type D Rear Engine bus types. Our research included a market analysis; key dealer feedback sessions in those markets where its deemed the largest volumes would occur; and a detailed comparison of the pros and cons of each product type. Ultimately, Blue Bird determined that the Type D Rear Engine product would provide the most beneficial and integrate more efficiently and effectively in this product type.

Integrating the Ford 7.3L engine and Roush CleanTech propane fueling system into the Type D-RE product is estimated to take approximately 3 years from initial product launch until start of production.
YEAR 1
oCreate detailed timeline of project
oDefine design concept
oDevelop performance targets
oEvaluate required specifications
oComponent design and specification development
oProcure components for prototype build
•YEAR 2
oBuild prototype
oDetermine testing parameters
oComplete testing of prototype
•YEAR 3
oFinalize build specifications and begin emission certification testing
oBegin dealer network training and develop marketing/promotion plan
oCoordinate rollout with PERC Council, the Advisory Committee, and segments of the propane industry that are involved in autogas sales.
oAnnounce product through various trade publications and industry events
oBegin production and delivery to customers

Vendor Capabilities

- *Describe why applicant is suited to complete this work including technical capabilities. Describe ability to commercialize the product (production, distribution, warranty). Discuss similar work completed. Identify personnel expected to work on this project. Who is responsible for creating deliverables – content/research/data/etc.? What's the review process and who is involved? List any external agencies or outside organizations that will be utilized and identify the purpose for which they will be needed*

Blue Bird designs and manufactures Type A, C & D school buses and has the experience and partnerships to integrate the propane fuel system into the Type D-RE platform. Blue Bird has delivered more than 20,000 propane school buses since the 2008 Type C product launch (represents 850M incremental gallons over the life of the units). Blue Bird and Roush's networks include established robust distribution, marketing, strategy, and sales and service network to support the Type D-RE propane school bus. Blue Bird successfully introduced, sold and continues to support propane autogas in the school bus Type A and C markets. In 2024, 20,000 propane school buses will safely transport 1.1 M students in 49 states. More than 15,000 of those

buses were sold and are supported by Blue Bird. Blue Bird is the only bus OEM with a propane school product. Blue Bird and Roush are responsible for deliverables. Blue Bird personnel : Albert Burleigh, VP, Alternative Fuels; Michael Boggess, VP, Product Development; and Joe Frabotta, Executive Director, Engineering as well as Steve Whaley, Propane Product Segment Lead for Product Marketing. The review process includes EPA and CARB certification and FMVSS.

Industry Engagement –

- *Does this project require propane industry stakeholders' involvement to be successful?*

Yes

- *How will you engage industry stakeholders?*

The propane industry stakeholders will play a significant role in the success of this project. The funding requested from PERC will allow this program to meet key milestones to successfully launch in the projected timeframe. With this funding the project can be compressed to achieve a completion date and launch by early 2027 which will coincide with significant EPA emission regulation changes. It's important that a Type D propane option is available during this critical time in the industry to provide an option that is near zero-emission, is cost effective, and reduces complexity.
Other stakeholders like Clean Cities organizations, the National Propane Gas Association, and propane marketers will play a key role in promoting this new product offering which directly aligns with their goals of decreasing gallons of diesel and replacing them with clean, domestically-produced energy.

Cost/Benefit Analysis –

- *What is the potential impact? (i.e., NPV, new gallons, units sold, persons trained, propane industry resource savings, safety, consumer education, etc.)*
- *What are the potential risks to achieving the impact? (i.e. fuel price; regulatory, environmental, or legislative considerations; propane marketer support)*
- *Are other parties or organizations involved?*
- *For products:*
    - *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?*
    - *Provide best, worst, and intermediate projection scenarios and describe what variables contribute to each scenario*

The total project cost is $10.2M. Blue Bird requests $2.4M from the propane industry with the remaining balance of $7.8M or 76.5% of the project cost coming from Blue Bird. This would include spend from Blue Bird to effectively develop, launch, market, train, and promote this new product to the marketplace.

Significant changes to emissions regulations in 2027 will bring costly and complex diesel engine changes. School districts and contractors will be looking for alternatives to diesel that can meet their operational requirements and budgetary needs. As a result, Blue Bird anticipates Year 1 propane market share in the Type D market will conservatively reach 50%. With significant planned training and promotion, Blue Bird projects this product will grow to 67% of the market and maintain that level, at a minimum, after Year 1. During the first five years, Blue Bird estimates a very conservative 1.5% industry growth rate which is consistent with industry forecasts provided by ACT Research data. The industry growth combined with Blue Bird market share growth will result in forecasted volume achieving over 1,400 units annually by Year 5. Blue Bird believes that market potential, with a ramped sales/delivery plan over five years, will result in over 6,400 units delivered over the first five (5) years of production—representing nearly 300M incremental gallons over the lifecycle of these units.

The potential risks to achieving these sales projections are:
•A significant reduction in the gap between traditional and propane fuel prices
•Accelerated adoption and significant cost improvement of EV
•A slowing of population growth which drives school revenue and need for capacity

Best, worst, and intermediate projection scenarios are provided on separate tabs in the ROI projections. A summary is as follows:
•Best scenario: Other OEMs discontinue their Type D offering providing Blue Bird with 100% share of the Type D segment. Probability: Unlikely as it is expected that one other OEM will offer a gas and diesel option in their Type D
•Worst scenario: The school bus industry will grow slower than forecasted. A major competitor reenters the Type D market increasing competitive products from 1 to 2. Blue Bird market share could struggle to grow greater than 50%. Probability: Highly unlikely as a leading market research company shows indication of significant market growth. It is also unlikely that a competitor will reenter the Type D market after exiting several years before to compete in a segment that is 10% of the total industry.
•Intermediate: The industry achieves significant growth due to pent-up demand and Blue Bird grows market share to 67% of the Type D segment. Probability: Likely as industry growth is supported by market research data. The growing trend towards alternative fuels and lower total cost of ownership will highly favor Blue Bird with a trusted and proven school bus, fuel type and fuel system.

Risk Assessment

- *Identify 3-5 potential risks to the successful completion of the project or inability to meet outcome targets, how likely those are to happen, impact on the project, and how to resolve those risks.*
- *Indicate low, medium, or high for "Likelihood" and "Impact."*

Risk	Likelihood	Impact	Risk Resolution and/or Contingency Plan
Legislation to accelerate EV school bus adoption beyond current requirements	Low	High	Increase lobbying efforts for propane school buses in key markets to promote positive TCO message, range advantages, and overall ease of adoption for customers
EV emergence & declining battery and EV bus pricing	Low	High	Likelihood of a significant reduction in battery prices to affect our TCO is low. Focus on range advantages.
Economic slowdown	Medium	Medium	The impact of lower taxes and reduced budgets usually trails the start of a recession by 24 plus months so we feel there is enough of a window to establish the products viability before any economic recession
GHG Phase 3 Stays in Place	Medium	Low	Blue-Bird and RCT have invested more than $15M to date in the 7.3L with another $20M plus coming for the 2027 so this level of investment by both companies displays our confidence that we see a long runway for this powertrain in the Blue-Bird Type C & D products. Their may be a need for some type of hybridization implemented with our propane engine technology (mild to plug-in) before the end of the decade. The timing and level of tech is not exact as there are many outside influences at play such as velocity of EV adoption, the new White House Administration, economy, etc. that could impact timing. A

			delay or significant modification to the current Phase 3 GHG regs will only give us a longer runway before we have to evaluate when some type of hybridization would need to occur to meet the requirements. This would be "icing on the cake" to an already very positive ROI for the propane industry.
Uncertainty of Tariffs	High	Low	We have already been on a path of bringing more content to domestic manufacturers prior to the tariff issue. Example, new propane injectors for 27MY and newer engines will be manufactured in South Carolina vs Europe. Additionally, the current propane tanks are USMC so while being manufactured in Canada there is no negative tariff impact to date. The situation remains fluid and we are investigating alternative domestic tank manufacturing options. Beyond that, of the higher cost components, fuel lines are produced domestically and we continue to look at developing domestic options for other higher value content.

Budget

- *Outline cost per task, including estimated cost share (cash and in-kind).*
- *If applicable, indicate hourly rates, including overhead.*
- *Highlight contractor vs. pass-through costs.*

The total project cost is $10.2M and Blue Bird requests $2.4M from the industry with the remaining balance of $7.8M or 76.5% of the project cost coming from Blue Bird. This would include spend from the Blue Bird and Roush CleanTech to effectively develop, launch, market, train and promote this new product to the marketplace.

Timeline

- *Provide a detailed timeline of all activities, tasks, and milestones. Include commencement and completion dates. List most responsible person for each task.*

Integrating the Ford 7.3L engine and Roush CleanTech propane fueling system into the Type D-RE product is estimated to take approximately 3 years from initial product launch until start of production. A high-level overview of the scope of work will include:

YEAR 1 (2025)
oCreate detailed timeline of project
oDefine design concept
oDevelop performance targets
oEvaluate required specifications
oComponent design and specification development
oProcure components for prototype build

YEAR 2 (2026)
oBuild prototype
oDetermine testing parameters
oComplete testing of prototype

YEAR 3 (2026-2027)
oFinalize build specifications and begin emission certification testing
oBegin dealer network training and develop marketing/promotion plan
oCoordinate rollout with PERC Council, the Advisory Committee, and segments of the propane industry that are involved in autogas sales.
oAnnounce product through various trade publications and industry events
oBegin production and delivery to customers

Market

Market – Geographical Reach

- *What is the geographical reach (national/regional?)*

National

Market – Target Audience

- *Who is the target audience?*
- *Why is the target audience important?*

Type D products are currently operating in all 50 U.S. states, although there are markets that have a higher fleet mix of Type D products, such as California, Washington, Oregon, Utah and Arizona. Propane powered school buses are operating today in 49 states. This broad coverage for Type D and propane will result in a national geographic reach. The target audience are customers currently operating Type D diesel products, current propane customers, and customers who will need an alternative to diesel products, especially with significant cost and complexity anticipated with 2027 diesel engines. There will be immediate acceptance of this product as many Type D customers have indicated their only reluctance to move to propane solution has been the lack of availability in a Type D bus. In addition, school districts and contractors are already aware of the significant changes coming in 2027 and are ready to move to alternative solutions. This product is coming at an ideal time as the shift away from diesel products has already begun and adoption of alternative-powered solutions will continue to accelerate.

Market – Market Research

- *Have you conducted market research in support of this project?*

Yes

Describe – Blue Bird has conducted extensive research over the last several years with existing and prospective propane customers as well as Type D-RE customers who are currently operating a mix of Type C propane buses in their fleet. The feedback from that research shows overwhelming demand for a propane autogas option in a Type D product. Blue Bird also worked closely with our dealer network to understand the pros and cons of both the Type D-FE and Type D-RE products to determine which would be the best fit for a propane application. The results of our research are clear: the Type D-RE provides the most benefits for our customers including visibility, maneuverability, serviceability, safety, and quiet operation. It’s also important to note that Type D customers are extremely loyal to the product type as the benefits provided by a transit style bus are significant to these customers.

Market – Competitive Landscape

- *Describe: (cite source of market information)*
  - *The size of the market.*
  - *The rate of growth for the market.*
  - *The degree of competition in the market.*
  - *Ability to penetrate the market.*
  - *Main competitors*

In addition to customer and dealer network feedback, Blue Bird also uses S&P Global Market Intelligence data to understand the size of each market segment and market trends for school bus types, fuel types, and customer segments. Blue Bird also relies on ACT Research data which provides regularly updated forecasts of N.A. Classes 5-8 vehicles. Based on information provided through these resources, the Type D market is projected to be approximately 4,000 units per year by 2027.

The school bus industry annual volume is historically 35,000 units. Because of the 2020 pandemic, the industry declined considerably in 2020 – 2023 resulting in annual volumes falling below 27,000 units. During this time, operational costs increased for school districts as they tried to maintain aging buses. This has resulted in pent-up demand and projected industry growth of 11% in 2024 followed by projected growth of 6% in 2025. The growth rate for years 2026 – 2029 are a more moderate projection of 1.5% year-over-year.

Historically, there are three major school bus OEMs providing Type D products. Blue Bird is dominant in the Type D segment with average market share over the last 10 years of 50%. Currently, the only fuel type offered in Type D products are diesel and electric. CNG was a fuel-type offered for several years, but it was discontinued as an offering in the school bus industry in 2023. In 2023, one of the three major OEMs discontinued their Type D product leaving only Blue Bird and one major competitor. In terms of a school bus propane offering, Blue Bird is the only provider at this time as all other OEMs have exited the segment. It is uncertain at this time if either OEM will re-enter the market with a propane offering.

Blue Bird is considered the alternative fuel leader in the school bus market with a strong following and loyal customer bus. We anticipate that the addition of the Type D-RE propane will be immediately accepted in the market place. The benefits of propane are widely known and the Type D-RE product is well established segment in the industry. Our dealer network has been promoting and selling propane school buses for 15 years and are well-versed on the benefits of propane buses for their customers. The popularity and growth of propane buses has been well documented through case studies and articles through industry trade magazines. With changes to diesel engine emissions and technology on the horizon, customers are ready to transition their school bus fleets to a fuel type that will result in reduced costs and simplicity in their operations.
The main competitors will be other brands offering similar platforms in diesel and battery electric. What is unknown is if a competitive propane engine will be developed and offered to other OEMs who sell a Type D product.

Market - Existing Offerings

- *Describe Market Leaders' positioning in the market – give examples.*

LPG is available in the Blue Bird Type A and Type C school buses, however, it is not available in the Type D platform. The product proposed could have a small cannibalization factor as some Type C customers may transition to the Type D because of the benefits it offers over a Type C school bus. Blue Bird expects to see growth primarily through additional sales to current Type C propane customers also operating Type D diesel buses in their fleet, as well as Type D customers who will be transitioning away from the cost and complexity of diesel engines.

Market - Positioning Strategy–

- *Outline a possible positioning strategy for the commercial launch of the new product.*
- *Share how current leaders are positioned in the market.*

The new product will expand on Blue Bird's position as the alternative fuels leader in the school bus market; Blue Bird offers more fuel types in more bus types than any other OEM. The Type D propane school bus will be a perfect complement to our strong positioning in the alt fuels market. We will feature this product as the lowest total cost of ownership product on a per rider basis with enhanced maneuverability, safety, and serviceability. The launch of the product will be supported by industry ride & drives so customers can experience how this product can operate in their fleets. To support this strategy, a dealer demonstrator program will be developed to put several of these new products in the market. We will have the Type D-RE propane bus at national industry trade shows as well as state conferences in all key markets. Marketing collateral will be developed to highlight the benefits. Heavy advertising will include print in major trade magazines, direct email blasts to school bus customers, social media posts, and company podcasts. To ensure alignment of messaging, dealer training will be provided through classroom and ride & drive events. Blue Bird is the unquestioned leader in the alternative fuel school bus marketplace with 60% of our sales being alternative powered school buses. Blue Bird is the only OEM offering propane-powered school bus products today. Blue Bird has over 20,000 propane products in operation today in 49 states and 9 Canadian provinces. This new product would continue our growth and dominance in this space and will complete our propane offering with all bus types: Type A, Type C, and Type D.The Type D-RE product will be distributed through our exclusive dealer network which spans the United States and Canada. Dealers are typically established within a State or Province and have strong local expertise on market, regulation, funding, etc.

Market – Other Information

- *What other information do you think is necessary to provide for this project?*

Blue Bird is perfectly positioned to develop and launch a product that will have an immediate and significant impact on propane fuels sales for refuelers. This is a proven strategy that has already resulted in significant growth in the industry.

Leverage and Synergies

Other audiences–

- *How could the content be used by other markets or industry organizations?*
- *How could the contents be used with other audiences beyond the target audience?*

The early challenges of launching the Type C propane bus were a result of lack of knowledge in the industry regarding performance, reliability, safety, cost, and infrastructure. As Blue Bird launches the Type D propane powered product, these same challenges and hurdles will be minimal, if not non-existent. Several years of industry education on the benefits of propane have proven to alleviate many of these concerns and have helped position propane as the best fuel-type for a school bus application. This will allow for immediate adoption of this new product in the marketplace.
Blue Bird and Roush CleanTech have built a strong partnership within our engineering, procurement, sales and marketing teams that have positioned this partnership as the strongest in the school bus industry. Blue Bird has a team dedicated to promoting alternative fuels and provides training and support to the dealer network. Roush CleanTech supplements this with additional sales and marketing support including participation with Blue Bird at industry events and plant tours to their manufacturing facility in Livonia, MI.

Development

Development - Potential Marketing, Communications, and Promotional Requirements–

- *Describe how the message(s) will be conveyed to the market.*
- *Identify opportunities to leverage existing channel(s). (i.e. ongoing outreach programs in other markets)*
- *Outline the marketing collateral that likely will be required.*
- *Describe the timeline for the activities above for the first three years.*
- *Identify 3-5 features and benefits the product or service will provide from a customer perspective.*
- *For products, Provide a Plan A and Plan B.*

The marketing campaign will feature benefits such as the lowest TCO on a per rider basis of any product in the industry; proven technology that completes the full suite of propane school bus products, & enhanced visibility, maneuverability, serviceability, and safety. The new product will expand Blue Bird's position as the alt-fuels leader in the school bus market. Messaging and communication begins with the pre-product launch (Summer/Fall 2026). Action items include: reveal at industry tradeshows including STN and NAPT; social media posts; trade magazine ads; marketing collateral developed; and dealer demo program developed and announced. Launch (Spring 2027) and action items include: dealer demos arrive at dealerships; dealer product and service training begins; Ride & Drive events scheduled/include propane refuelers; Blue Bird and Roush facility tours; and ads continue in trade magazines, email blasts, and social media. Post Launch (2028/2029). Action items include customer testimonials and case studies; podcasts; TCO messages include driver experience, extreme warm and cold weather performance; and user panel discussion at key state and national industry tradeshows.

Delivery

Delivery – Delivery Channels –

- *Describe the distribution channels*
- *What existing delivery channels will be used?*
- *Who is responsible for deploying/delivering product?*

Blue Bird school bus products are sold through an experienced dealer network spanning the United States and Canada. We also sell products to private school bus contractors through our internal direct sales team. Our dealer network is responsible for delivering these products in their respective markets.

Delivery – Partnership Outreach

- *Describe the channel to market – are there multiple channels?*
- *Describe alternate pathways to commercialization*
- *Describe outreach plans for OEMs*
- *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)*
- *Who needs training to deliver this program?*

This product will be sold through our existing dealer network of approximately 50 Blue Dealers through the United States and Canada and our direct sales team who have been selling and delivering propane products since 2008. As there are some differences to the existing Type A and Type C propane products, additional training will be provided to ensure a successful product launch. This includes training to the service technicians in our dealer network and other independent service providers. This product will utilize the same engine and fueling system as our existing products, therefore requiring similar training currently developed today with the main focus being on the location and packaging of components. In addition, other industry stakeholders

including propane marketers, clean energy advocates, and propane industry organizations, will receive product information and training to help support and promote this new product. As the benefits of the fuel are the same with this new offering as with existing products, the messaging relating to the many benefits of propane is already well established.

Delivery – Allied Partner Participation

- *Are there allied or strategic partners who will be engaged in this delivery?*

Blue Bird Dealer Network; Roush CleanTech; PERC.

Customer service and Support Needs —

- *What are the customer service and support requirements?*
- *What service and support resources are required?*

The proposed product requires strong warranty support as well as ongoing technical and service support for the full life cycle of the product. This product will be supported through the established and successful framework already developed by Blue Bird, Ford, and Roush CleanTech. Today, there are over 500 service providers including Blue Bird dealers, Ford dealerships, and independent repair facilities who have been trained to provide warranty and maintenance support as well as aftermarket parts support. The existing strategy of providing additional field service support from Roush CleanTech and Blue Bird will play a critical role in ensuring service provides get the support needed to repair buses quickly to maintain a high vehicle uptime.

Service Networks

- *Rate the maturity of the service networks based on geographic locations, depth of service, etc. (1 as the worst, 5 as the best)*

5

Describe:

Blue Bird began selling and servicing propane products in 2008 and a has well-established service network to support these products. The service network covers all markets where Blue Bird propane buses are in operation. Due to the simplicity of the engine and emissions system, there is a vast number of technicians available who have the technical background to work on this engine and fueling system. We rate our ability to service propane products in the market as a 5.

Will training of current networks be required? –
Yes

What training material is being developed and how will it be deployed?: –

Blue Bird will develop online and in-person training prior to the launch of this product. As we develop for all new products, we will provide new driver and service manuals to provide the information needed to effectively operate and maintain this new product. Training will be provided both to dealership personnel and end-users supported by Blue Bird, Roush CleanTech and Ford. Because the engine and fuel system will be the same on the Type D as our existing products, much of the training will be similar to what has already been developed and proven to be effective.

Are service and support developed through this project? –
Yes

- *What does an established network look like?*
- *What's the timeframe?*
- *What are the limitations?*

Our service network is already established as we have been providing parts and service support for our Type A & Type C propane products for almost 15 years. We have an existing service network of over 500 service locations throughout the US and Canada. We are always expanding our network of service providers and will continue those efforts as we launch this new product.

Is there a PERC website/learning center component that will need to be updated/created? –
Yes

Describe:

Blue Bird and Roush will provide digital resources for this new product including product brochures, spec sheets, on-line bus ordering updates, service manuals, and driver's manuals. These resources will be available at time of launch or before.

Expected Launch Date–

- *State the target launch date/outreach kickoff*

2027-06-01

PERC Portfolio–

- *Describe where this project stands within the context of PERC's entire portfolio.*
- *Have there been previous PERC funded projects in this category? What results have been achieved with previous similar projects?*

There have been no other direct funding projects to Blue Bird.

MEASUREMENT & EVALUATION

Project Deliverables and Market Outcomes

- *Detail how success will be measured for this project overall and by tactic, what the metric is, and when it will be achieved.*

Goal/Milestone	Project Deliverable or Market Outcomes	Metric	By Date	Tied to Payment Y/N	Payment Due upon completion
GHG3 Emissions Strategy Confirmed	Propane volume maintenance/growth understood	ROUSH/BB aligned statement	2025-12-01	Yes	$600,000.00
Prototype Build	Functional prototype available for testing	Operational Type D-RE propane prototype	2026-06-01	Yes	$600,000.00

Bus validation complete	Ready to move to production statement	Completed validation documentation - Including performance acceptance	2027-03-31	Yes	$600,000.00
Bus SOP	Bus enters production		2027-06-01	Yes	$600,000.00

Intellectual Property

Who owns the data and or intellectual property generated from this project? Describe:

The data and intellectual property will be owned by Blue Bird.

Is this a new contractor? No

Budget Impact

- *Provide the budget market & activity this project will be impacting.*

Market & Activity	Amount Requested	Year Total	YTD Remaining	Remaining if Funded
2025 > Autogas (On-Road) > Product Development	$600,000.00	$2,003,808.00	$400,000.00	-$200,000.00
2026 > Autogas (On-Road) > Product Development	$600,000.00	$0.00	$0.00	$0.00
2027 > Autogas (On-Road) > Product Development	$1,200,000.00	$0.00	$0.00	$0.00

Does this project have a past funding history? Yes

Funding History for Similar Dockets

- *Provide a funding history for similar projects, including the project budget, final or current spend, and project results.*

Year	Docket #	Project Budget	Project Spend
2006	1830	$859,494.00	

Results:

Year	Docket #	Project Budget	Project Spend
2010-2011	16607	$1,897,703.00	

Results:

Year	Docket #	Project Budget	Project Spend
2020-2022	22038	$1,350,000.00	$0.00

Results: Roush CleanTech

Research and Development

Research and development costs are expensed as incurred and included in selling, general and administrative expenses on our Consolidated Statements of Operations. For fiscal 2023, fiscal 2022 and fiscal 2021, the Company expensed $6.6 million, $6.1 million and $5.2 million, respectively.

Docket 24613 - Propane Powered Rear Engine Type D Bus

Return on PERC Investment of $2,400,000

				2027 Year 1	2028 Year 2	2029 Year 3	2030 Year 4	2031 Year 5	2032 Year 6	2033 Year 7		
			Total SB industry	39645	39945	40545	41153	41770	42397	43033		
			Type D Industry	3,965	3,995	4,055	4,115	4,177	4,240	4,303		
			Blue Bird market share	1,982	2,676	2,717	2,757	2,799	2,841	2,883		
School Bus	gallons/unit/year	4000	Type D propane sales	991	1,338	1,358	1,379	1,399	1,420	1,442		
	Lifecycle(years)	12	Incremental gallons	3,964,500	5,352,630	5,433,030	5,514,525	5,597,243	5,681,202	5,766,420		
			Aggregate gallons	3,964,500	9,317,130	14,750,160	20,264,685	25,861,929	31,543,131	37,309,551	7 year Margin Generated ($.30)	$42,903,326
			Lifetime gallons (12 year)	47,574,000	64,231,560	65,196,360	66,174,305	67,166,920	68,174,424	69,197,040	7 year Assessment Returned ($.005)	$715,055
											Lifetime Margin Generated	$134,314,383
											Lifetime Assessment Returned	$2,238,573

Intermediate Scenario Assumptions:

Industry projections from ACT Research

Industry growth rate: 1.5% per year (per ACT Research)

Projected Lifetime Margin ROI **55.96**

Autogas Projects Lifetime Margin ROI *55x*

Total Lifetime Gallons **447,714,609**

Total Lifetime Margin Generated **$134,314,383**

Docket 24613 - Propane Powered Rear Engine Type D Bus

Return on PERC Investment of $2,400,000

				2027 Year 1	2028 Year 2	2029 Year 3	2030 Year 4	2031 Year 5	2032 Year 6	2033 Year 7		
			Total SB industry	39645	40240	40642	41048	41459	41874	42292		
			Type D Industry	3,965	4,024	4,064	4,105	4,146	4,187	4,229		
			Blue Bird market share	3,965	4,024	4,064	4,105	4,146	4,187	4,229		
School Bus	gallons/unit/year	4000	Type D propane sales	1,982	2,012	2,032	2,052	2,073	2,094	2,115		
	Lifecycle(years)	12	Incremental gallons	7,929,000	8,047,935	8,128,414	8,209,698	8,291,795	8,374,713	8,458,461		
			Aggregate gallons	7,929,000	15,976,935	24,105,349	32,315,048	40,606,843	48,981,557	57,440,017	7 year Margin Generated ($.30)	$68,206,425
			Lifetime gallons (12 year)	95,148,000	96,575,220	97,540,972	98,516,382	99,501,546	100,496,561	101,501,527	7 year Assessment Returned ($.005)	$1,136,774
											Lifetime Margin Generated	$206,784,062
											Lifetime Assessment Returned	$3,446,401

Best Scenario Assumptions:

Industry projections from ACT Research
Industry growth rate: 1.5% per year (per ACT Research)
Type D % is 10% of industry
BB Type D market share: 100% years 2-7
50/50 mix of Type D propane/gas
Annual propane gallons per unit: 4000

Projected Lifetime Margin ROI	**86.16**	**Total Lifetime Gallons**	**689,280,208**
Autogas Projects Lifetime Margin ROI	*55x*	**Total Lifetime Margin Generated**	**$206,784,062**
Projected Lifetime Assessment ROI	**1.44**	**Total Lifetime Assessment Returned**	**$3,446,401**
Autogas Projects Lifetime Assessment ROI	*0.5x*		

Docket 24613 - Propane Powered Rear Engine Type D Bus

Return on PERC Investment of $2,400,000

				2027 Year 1	2028 Year 2	2029 Year 3	2030 Year 4	2031 Year 5	2032 Year 6	2033 Year 7		
			Total SB industry	39645	39050	38465	37888	37319	36759	36208		
			Type D Industry	3,965	3,905	3,846	3,789	3,732	3,676	3,621		
			Blue Bird market share	1,982	1,953	1,923	1,894	1,866	1,838	1,810		
School Bus	gallons/unit/year	4000	Type D propane sales	991	976	962	947	933	919	905		
	Lifecycle(years)	12	Incremental gallons	3,964,500	3,905,033	3,846,457	3,788,760	3,731,929	3,675,950	3,620,811		
			Aggregate gallons	3,964,500	7,869,533	11,715,990	15,504,750	19,236,678	22,912,628	26,533,439	7 year Margin Generated ($.30)	$32,321,255
			Lifetime gallons (12 year)	47,574,000	46,860,390	46,157,484	45,465,122	44,783,145	44,111,398	43,449,727	7 year Assessment Returned ($.005)	$538,688
											Lifetime Margin Generated	$95,520,380
											Lifetime Assessment Returned	$1,592,006

Worst Scenario Assumptions:

Industry declines 1.5% per year due to economic turndown
Type D % is 10% of industry
BB Type D market share: 50% years 2-7
50/50 mix of Type D propane/gas
Annual propane gallons per unit: 4000

Projected Lifetime Margin ROI	**39.80**	**Total Lifetime Gallons**	**318,401,266**
Autogas Projects Lifetime Margin ROI	*55x*	**Total Lifetime Margin Generated**	**$95,520,380**
Projected Lifetime Assessment ROI	**0.66**	**Total Lifetime Assessment Returned**	**$1,592,006**
Autogas Projects Lifetime Assessment ROI	*0.5x*		