ADB GLOBAL SOLUTIONS

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Executive Summary: Heavy-Duty Bi-Fuel Powertrain

Introduction: ADB is an entrepreneurial pioneer organization creating innovative solutions in support of the de-carbonization of the heavy haulage trucking industry. On the path towards net-zero it is challenging for stakeholders to find capable and feasible solutions to fulfil with the responsibility to decarbonize in due time.

The Market Problem:
The European trucking industry is facing aggressive, structurally mandated decarbonization trajectories, requiring a 45% reduction in fleet CO2 emissions by 2030 and a 90% reduction by 2040. However, Original Equipment Manufacturers (OEMs) and logistics fleets are struggling to transition. Battery-electric vehicles (BEVs) and hydrogen fuel cell electric vehicles (FCEVs) face massive infrastructure bottlenecks, prolonged development cycles, and cannot currently meet the range and payload requirements of long-haul heavy goods transport. Additionally, the power generation industry is almost solely based on diesel generators and urgently needs innovative solutions. These industries urgently require mechanical innovations that allow a phased, immediate shift towards net-zero.

The Solution & Technology Asset:
We have developed a high-performance gas engine engineered directly onto the commercially proven DAF MX-13 long block, featuring a clear development pathway toward a zero-emission Bi-Fuel architecture. This advanced Internal Combustion Engine (ICE) combines the zero-emission compliance of hydrogen with the high performance and range of biogas. Crucially, the transition to hydrogen is significantly de-risked; we have already successfully completed extensive R&D on a smaller-displacement hydrogen engine, providing proven thermodynamic and engineering experience that is now ready to be directly applied to this heavy-duty platform.

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Technical Validation & De-risking:
The technology is not just conceptual; the core thermodynamic and mechanical risks have been entirely mitigated through rigorous testing:

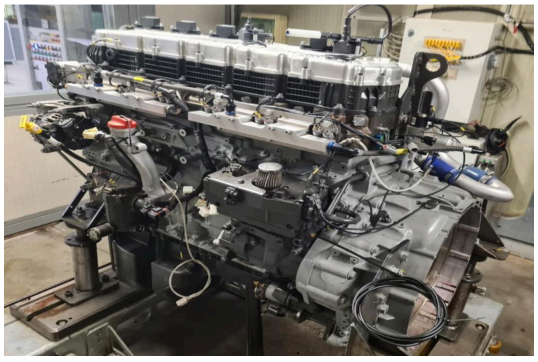
- **Biogas Benchmark:** The engine has been re-manufactured and successfully validated on the test bench using biogas, producing a maximum output of 540 HP at 1700 rpm and 2500 Nm of torque at 900-1300 rpm. This represents 18% more power and 25% more torque than competing engines using similar technology.

- **Teardown Validation:** Exhaustive (STEP02) test bench runs and physical teardown analyses confirm that the customized hardware (including CNC-machined external waste gates and proprietary beryllium copper spark plug bushings) operates flawlessly. The cylinder liners, piston crowns, and crank train exhibit zero abnormal wear or knocking degradation under high-load conditions.

The Bi-Fuel Evolution (Hydrogen + Biogas):
To achieve complete Zero and Low-Emission Vehicle (ZLEV) homologation, the project is currently exploring into integrating a dual-system Bi-Fuel architecture.

- **Operational Flexibility:** The engine utilizes separate fuel delivery and dual injection systems, allowing it to burn hydrogen in environmentally sensitive areas for near-zero emissions, while seamlessly switching to biogas (bio-LNG) to leverage existing refueling networks and achieve longer range and lower operating costs.
- **Rapid Commercialization:** Because the baseline biogas combustion geometry and hardware are already validated, the remaining development for the hydrogen demonstrator engine requires a timeline of only 6 months.

The Commercial Opportunity:
Because the technology is built upon the widely-utilized DAF MX-13 architecture, it is immediately applicable to any new commercial vehicle utilizing DAF components. It is an ideal acquisition target for a Tier 1 supplier looking to offer zero-emission Bi-Fuel engine, "repower kits" to logistics fleets, or a OEM for commercial vehicle or power generation, seeking to bypass years of R&D and integrate a Euro VI/VII compliant bridging technology into their product line. Apart from all these opportunities, there is a possibility to start a recycle project in which end-of-life engines can be completely refurbished into remanufactured zero-emission engines.



Transaction Goals & Strategic Objectives: The primary objective of this engagement is to execute an outright strategic sale (up to a 100% buyout) of the heavy-duty gas and Bi-Fuel engine project to a (strategic) buyer. This transaction will encompass the complete transfer of the project's intellectual property, proprietary hardware engineering designs. Crucially, the acquisition will also include the complete transfer of the proprietary calibration maps and the full intellectual property of data and rights to the programming software for the Engine Control Unit (ECU).

Ultimately, our main strategic goal for this transaction is to ensure the project secures the capital investment and industrial scale it deserves, allowing this highly-validated technology to fully mature and achieve its rightful position in the commercial EU market.

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