

The Role of HydroDiesel+® in Sustainable Development and Economic Growth

Name: Parsa Safa ; Rosita Ghalajkhani ; Mahdi Safa
Supply Chain and Logistics Technology

Introduction

Energy production is essential to economic growth. While fossil fuels comprise 80% of the current global energy demand, they also produce approximately two thirds of global CO₂ emissions. When it comes to sustainability within the fuel market, HydroDiesel+® provides a great alternative at lower costs. Sustainable fuel production underpins the global economy, promotes energy security, enriches communities and enables environmental stewardship. Our research aim to investigate how producing HydroDiesel+® can create new economic opportunities. Reducing specific fuel consumption and harmful emissions, while boosting diesel engine performance are all issues that this project hopes to tackle. While widespread supply chain issues have crippled the economy over the past two years, the efficient supply chain framework of HydroDiesel+® is discussed.

HydroDiesel+® vs Diesel

- Water in Diesel nano emulsification technology reduces the formation of unburned fuel and increases fuel burn efficiency.
- HydroDiesel+® provides 20% more fuel relative equal price.
- Up to 20% lower overall maintenance cost than regular diesel while providing improved fuel economy, more work output, work per fuel volume, and lower emissions.
- HydroDiesel+® is the most effective, profitable, and environmentally friendly solution to conventional diesel and biodiesels or synthetic diesels.



Environmental Sustainability

- HydroDiesel+® reduces the SFOC (specific fuel oil consumption) by up to 15%, allowing you to burn less hydrocarbon.
- Intermixing gives HydroDiesel+® the ability to be used on any existing Diesel engines without any modifications.
- For every gallon of fuel consumed, HydroDiesel+® can reduce lifecycle CO₂ footprint by up to 40%; plus, up to 80% lower NO_x, 75% lower Particulate, 90% lower Opacity, +300% lower Fuel Sulfur Content.
- HydroDiesel+® provides approximately 22% lower emissions when compared to unleaded gasoline.
- These are all reasons why HydroDiesel+® addresses 9 out of the 17 Sustainable Development Goals created by the United Nations Department of Economic and Social Affairs.

Procedure

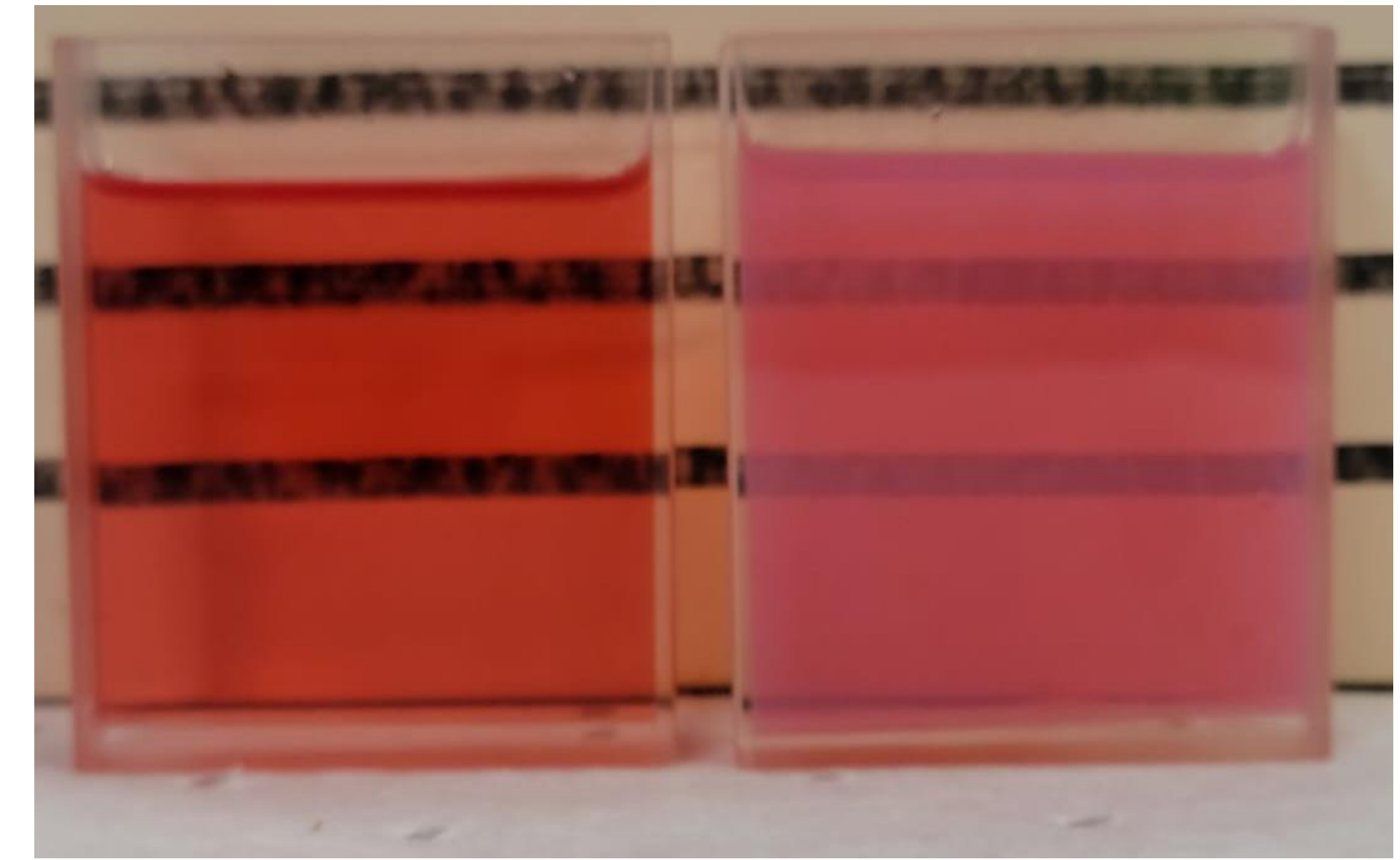
- First, the Diesel, water, and mixed surfactant package are maintained at ideal temperature.
- All materials are measured by weight as they make their way through the sensors and dosing system to the mixing apparatus.
- Next, the Diesel and Mixture then meet at the first set of mixers where there are combined.
- After completing the first set of mixing apparatus, the mixture then gets combined with the water through another set of mixing and dosing apparatus.
- The whole process is being temperature controlled and weight monitored at every stage.
- Finally, the HydroDiesel+® is made into a thermodynamically stable nano emulsification fuel with a stability in excess of 1yr..



Decentralized - SMART Blending System™

Supply Chain Process

- Our industry partner provides premade blending stations and ships to costumers. The production of HydroDiesel+® is done in a decentralized fashion to ensure wide adoption.
- Within 4 months (usually less), stations are sent and installed at fuel terminal, fuel hubs, distribution centers or even onboard ships.
- A central system manages remote operations.
- The developed supply chain model stems around supplying equipment on operation leases and tolling fees, or through the direct supply of fuel to offtakers.
- The Catalyst mixture is also produced and supplied to the decentralized production stations.

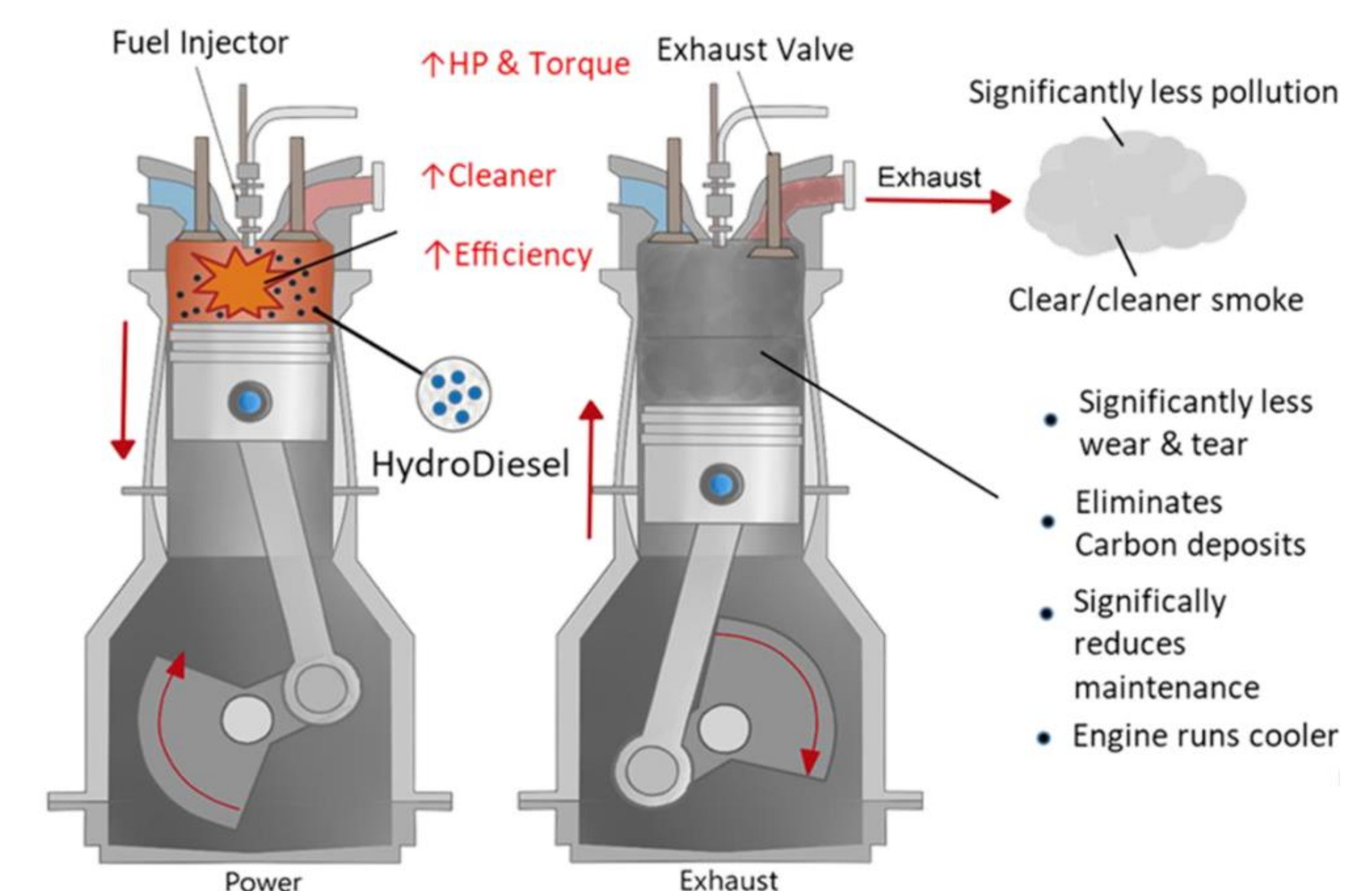


Regular ULS Diesel

HydroDiesel+®

Discussion and Results

- HydroDiesel+® has the potential to be a sustainable, energy transition alternative to conventional Diesel.
- While using 20% less hydrocarbon, HydroDiesel+® provides significant production cost savings.
- HydroDiesel+®'s logistics model provides a fast and seamless transition into the future of fuel supply chain.



Acknowledgement

This study has been created through a project supported by our industry partner, Trillion LLC. The authors are grateful to have the opportunity to work on this research project with the group of industry experts. We hope that this study will provide direction for the fuel industry for the advancement and application of new fuel technologies.