

## Industrial Consultancy & Sponsored Research (IC&SR)

### A Dynamic fuel blending system for internal combustion engines and a method thereof

#### IITM Technology Available for Licensing

##### Problem Statement

- The **diesel engine** has become a ubiquitous prime mover powering the world's shipping, road freight haulage, automobiles, stationary engines, and railway locomotives.
- The ever-increasing diesel usage, cost, and environmental concern have forced the world to look for alternatives, such as advanced diesel combustion modes using carbon-neutral, renewable fuels.
- Advanced diesel combustion modes such as **Homogeneous Charge Compression Ignition (HCCI)** operated on renewable fuels potentially resolves all the prominent emission and performance issues of diesel engine.
- By integrating the present invention's technology, existing diesel engines would operate in **clean and highly efficient HCCI mode using biofuels**.

##### Technology Category/ Market

**Technology:** Dynamic fuel blending system & method;

**Industry:** Energy, Power production;

**Applications:** Sustainable energy production, Energy, Automobile;

**Market:** The global internal combustion engine market is projected to grow at a **CAGR of 9.3%** during the forecast period (2021-2030).

##### Technology

- Present patent claimed a **fuel blending system & method** of its integration with current internal combustion engines for fuel-efficient, low-polluting combustion.
- Said invention implements **Homogeneous Charge Compression Ignition (HCCI)** combustion through **minimal changes in existing engines**.
- Said invention **effectively addressed HCCI problems**, ensuring continuous operation over the entire engine load range and adequate fuel-ignition control.
- Said invention allows flexi-fuel operation, **it can appropriately and dynamically prepare and**

**deliver multi-fuel blends in desired quantity** to the engine's injector unit depending on the HCCI engine operating conditions.

##### Image

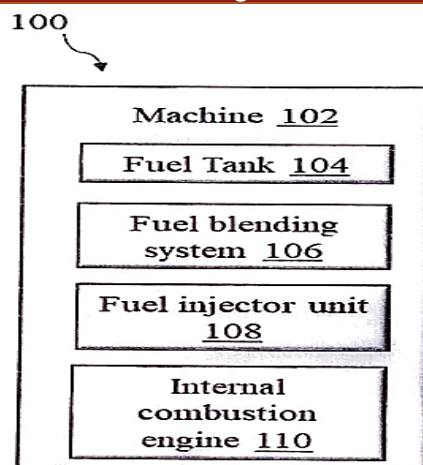


Fig.1: Illustrates an environment friendly machine comprising fuel blending system

##### Key Features / Value Proposition

- ❖ **Technical Perspective:** Facilitates high **thermal efficiency and lower emissions** in internal combustion engines using **gasoline-like high volatility & low reactivity fuels** & locally available **renewable low-carbon fuels** to perform successful **HCCI** combustion operation.
- ❖ **Industrial Perspective:** Sustainable energy production, more **Eco-friendly**.

##### Intellectual Property

IITM IDF Ref. 2402;

Patent No: 433130 (Granted)

##### TRL (Technology Readiness Level)

TRL- 3, Proof of Concept ready & validated

##### Research Lab

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