Monday, June 1, 2026

**RE: IFS Blue Gasoline - Community Health and Environmental Safety Memo**

Beyond its significant greenhouse gas reductions, IFS synthetic gasoline offers substantial localized environmental improvements by eliminating harmful tailpipe pollutants and toxic additives inherent in conventional crude-derived fuels. Produced via the Methanol-to-Gasoline (MTG) process, this synthetic fuel contains undetectable levels of sulfur, lead, manganese, and phosphorus (ref. Bureau Veritas analysis). The elimination of sulfur is particularly critical, as it prevents the "poisoning" of catalytic converters, thereby ensuring these systems remain highly efficient at mitigating nitrogen oxides and carbon monoxide. Furthermore, the absence of metallic additives prevents the release of toxic particulate matter (PM2.5) into the roadside environment. The synthetic fuel also reduces benzene content - a known human carcinogen - by approximately 50% compared to traditional gasoline, directly curbing both evaporative and exhaust toxicity. These clean-burning characteristics allow the fuel to operate as a "drop-in" solution, providing immediate air quality improvements without requiring modifications to existing vehicles or distribution infrastructure. By reducing these pollutants, the project delivers measurable public health benefits, including lower morbidity and mortality rates associated with poor air quality. Ultimately, this cleaner molecular composition sets a new benchmark for transportation fuel, demonstrating that high-performance energy production can simultaneously enhance community health and environmental safety and be derived from a fossil feedstock.

When the Clean Fuel Regulations (CFR) and British Columbia Low Carbon Fuel Standard (BC LCFS) frameworks were originally developed, low-carbon gasoline produced from natural gas with integrated carbon capture and permanent storage did not exist in North America. IFS Blue Gasoline™ represents a new category of transportation fuel, achieving approximately 98% $CO_2$ capture during production while remaining fully compatible with existing vehicles and fuel infrastructure. Unlike bio-based ethanol blending strategies such as E10 or E15, IFS Blue Gasoline™ is a true drop-in fuel with no blending limits, no vehicle compatibility constraints, and no changes required to existing pipelines, terminals, storage facilities, or retail fueling infrastructure.

At IFS production scale of 36,000 barrels per day (approximately 2.1 billion litres per year), the lifecycle carbon reduction relative to conventional gasoline is equivalent to removing approximately 325,000 to 500,000* passenger vehicles from Canadian roads each year. This exceeds the emissions reduction impact typically achieved through E10 or E15 ethanol blending programs while maintaining the full performance, energy density, and logistical advantages of conventional gasoline. Using the same volume, the E10/E15 ethanol blending used at retail pumps today is equivalent to removing approximately 60,000* vehicles by comparison.

Through combining deep production decarbonization with cleaner combustion characteristics, IFS Blue Gasoline™ establishes a new benchmark for gasoline and demonstrates how meaningful emissions reductions can be achieved immediately using existing infrastructure while supporting the transition to a lower carbon transportation sector.

## Cars Removed Calculations, Comparisons, References

Using IFS production volume: **36,000 bpd**, **5.04 GJ/bbl**, and **4.6 $tCO_2e$/car/year**.

Typical car equivalent uses **4.6 $tCO_2$/year**.
https://www.epa.gov/greenvehicles/greenhouse-gas-emissions-typical-passenger-vehicle

**Annual fuel energy:**
36,000 × 365 × 5.04 = **66.23 million GJ/year** = **66.23 billion MJ/year**

CFR gasoline baseline is **95 $gCO_2e$/MJ**; BC LCFS gasoline baseline is **93.67 $gCO_2e$/MJ**.

**E10 CI assumption**
E10 = 90% conventional gasoline + 10% ethanol at **CI 52**.

| Case | CFR CI | CFR avoided $tCO_2e$/yr | CFR cars removed | BC LCFS CI | BC avoided $tCO_2e$/yr | BC cars removed |
|---|---|---|---|---|---|---|
| Conventional gasoline Benchmark | 95.0 | 0 | 0 | 93.67 | 0 | 0 |
| E10, ethanol CI 52 | 90.7 | 284,770 | 61,900 | 89.50 | 275,930 | 60,000 |
| IFS Blue Gasoline | 72.9 | 1,463,590 | 318,200 | 59.4 | 2,269,750 | 493,400 |

**Key takeaway**

At **36,000 bpd**, IFS Blue Gasoline equals roughly:

**CFR: ~318,000 cars removed/year**
**BC LCFS: ~493,000 cars removed/year**

Compared to E10, IFS delivers about **5.1× more avoided emissions under CFR** and **8.2× more under BC LCFS**.

**General Formula**

$$\text{Cars Removed} = \frac{(CI_{baseline} - CI_{fuel}) \times V \times E}{1{,}000{,}000 \times EF_{car}}$$

Where:

$CI_{baseline}$= Conventional gasoline CI ($gCO_2e$/MJ)
$CI_{fuel}$= Fuel CI ($gCO_2e$/MJ)
$V$= Annual fuel volume (barrels/year)
$E$= Energy content (MJ/barrel)
$EF_{car}$= Annual vehicle emissions ($tCO_2e$/car/year = 4.6)

**Government of Canada**

**Human Health Risk Assessment for Gasoline Exhaust – Summary**

Link for commentary on particulate emissions from conventional gasoline:
https://www.canada.ca/en/health-canada/services/publications/healthy-living/human-health-risk-assessment-gasoline-exhaust-summary.html

## Catalytic Converter Poisons

Automotive catalytic converters are poisoned or fouled by contaminants in the exhaust that coat, react with, or deactivate the precious metal catalysts (platinum, palladium, and rhodium). These components prevent the catalyst from making contact with the exhaust gases, permanently destroying its ability to reduce emissions. [1, 2, 3]

The primary catalyst poisons include:

**IFS Blue Gasoline™ 3rd party test results**
**Undetectable for all 4 poisons listed below**

1. **Phosphorus**
   a. Source: Engine oil additives (like ZDDP/zinc dialkyldithiophosphate) that enter the combustion chamber due to worn piston rings or valve seals. [1]
   b. Effect: Phosphorus covers the active catalyst sites and reacts with base metals (like cerium), decreasing the catalyst's characteristic surface area and its ability to store oxygen. [1]
2. **Lead**
   a. Source: Historically found in leaded gasoline (leaded fuel is now illegal for road use in most of the world, but legacy contamination or accidental misfueling still poses risks). [1, 2]
   b. Effect: Lead physically coats the catalyst material, acting as a physical block that renders the precious metals completely ineffective. [1, 2, 3]
3. **Silicon / Silicates**
   a. Source: Ingested dirt/dust, or the use of improper, non-sensor-safe silicone sealants/gaskets inside the engine.
   b. Effect: When burned, silicon deposits a hard, glass-like layer over the catalyst honeycomb, permanently sealing it off from the exhaust gases. [1, 2]
4. **Sulfur**
   a. Source: Naturally occurring in gasoline and diesel fuels.
   b. Effect: Sulfur can temporarily foul catalysts (especially under rich fuel conditions), reducing efficiency. While "sulfur poisoning" is usually reversible by driving the vehicle at high speeds to heat up the converter, chronic exposure can lead to permanent degradation. [1, 2, 3, 4]

[1] https://oulurepo.oulu.fi/bitstream/handle/10024/34640/isbn978-951-42-8608-7.pdf?sequence=1&isAllowed=y
[2] https://www.chemguide.co.uk/physical/catalysis/introduction.html
[3] https://en.wikipedia.org/wiki/Catalytic_converter
[4] https://www.ebsco.com/research-starters/environmental-sciences/catalytic-converters