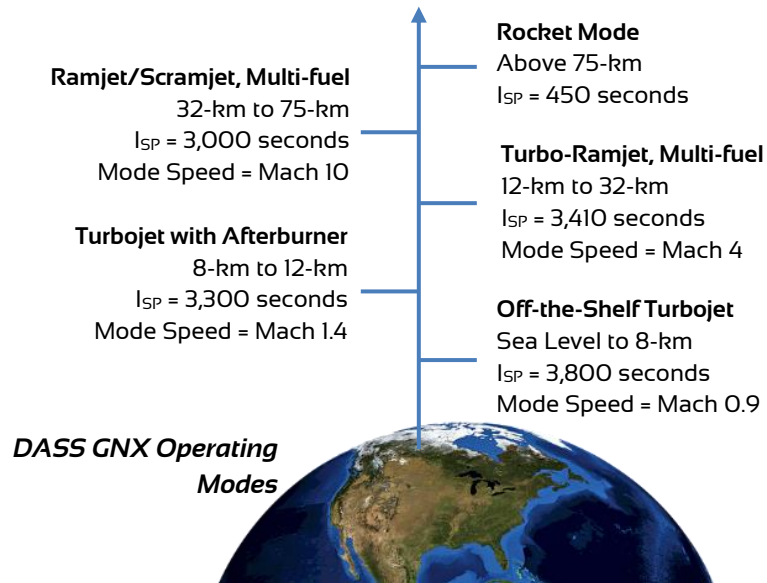


Established in 2012, Space Engine Systems (SES) is a Canadian aerospace company that is pioneering the next generation of propulsion technologies for aerospace and space. Our goal is to power a reusable Single-Stage-To-Orbit (SSTO) vehicle for space applications. SES has conducted more than 2 decades of research which has led to development of multi-fuel propulsion systems, novel heat exchangers, high temperature gearboxes, nanotechnology, and custom bearings.

The DASS GNX engine is a combined-cycle engine utilizing various modes and fuels to optimize specific impulse (I_{sp}) over any given flight regime. It can reduce the overall fuel consumption, thus increasing the payload mass fraction.



DASS GNX Engine



Low Earth Orbit (LEO) mission comparison.

Vehicle	SSTO using DASS GNX	Falcon 9 Block 5	Falcon 9 Block 5
Mode	100% Reusable	1 st Stage Recovered**	Expendable No recovery
Payload [kg]	18,800	16,400	22,800
Fuel Consumption [kg] Sea Level to 75 km	131,600	370,700	418,700
Fuel Consumption [kg] 75 to 400-km	341,300	111,500	111,500
Fuel Consumption [kg] Recovery	0	48,000	0
Total Take-off Weight [kg]	580,300	580,300	586,700

Payload capacity comparison at total take-off weight.

Payload Capacity [kg]	SSTO using DASS GNX	Falcon 9 Block 5	Falcon 9 Block 5
	100% Reusable	1 st Stage Recovered	Expendable No recovery
LEO	18,800	16,400	22,800
GTO*	11,570	5,500	8,300
Lunar* [TLI]**	9,390	3,370	5,690
Mars* [TMI]**	8,330	2,190	4,080

*Above 400-km, an SSTO vehicle with the DASS GNX releases payload(s) with a recoverable propulsion system for geosynchronous transfer orbit (GTO), trans-lunar injection (TLI) and trans-mars injection (TMI) missions.

** Estimated.

HIGHLIGHTS

- 15% increase in payload mass fraction to LEO.
- 23% fuel reduction for equivalent LEO payloads.
- 179% increase in payload mass fraction for Lunar mission.
- 281% increase in payload mass fraction for Mars mission.
- Completely re-usable SSTO capabilities.
- Adaptable and scalable technology for variable missions.
- Off-the-shelf components with high life-cycle and reliability.
- Modular design with option of engaging rocket mode at a range of altitudes (45 – 75 km).
- Runway launch and landing capabilities.
- No need for pitchover maneuver.