

The IntelliGas Group (iGas Energy Limited and associated companies) is a Queensland-based gas technology specialist which has developed world patented processes and components, collectively known as Cool5000™ for the production, storage, dispensing and utilisation of High Density Compressed Natural Gas (HDCNG). The technology is market-ready and in the early stages of commercialisation.



HDCNG: NEW GAS FUEL FOR HEAVY DUTY TRUCKS

"This is an untapped market for natural gas in which the annual consumption exceeds 120 PJ in the eastern states of Australia alone, and has always been the province of diesel," explains IntelliGas Managing Director Paul Whiteman.

"For heavy duty applications, conventional CNG has been disadvantaged due to the lack of gas engines, and by the space and weight claim that the fuel tanks make on the vehicle compared to liquid fuels – such heavy vehicles have, until HDCNG, been considered to be a market for LNG," says Mr Whiteman.

HDCNG is natural gas which is compressed, stored and dispensed at a pressure of 350 barg via the IntelliGas Group's Cool5000™ processes and components to provide natural gas as fuel for large fixed and mobile engines such as heavy duty highway trucks, rail locomotives, mining machinery and remote power generation. This high-energy density fuel is a substitute for liquid petroleum fuels in both fixed and mobile applications at a significantly lower cost than LNG, whilst making comparable on-vehicle weight and space claims as LNG.

HDCNG COMPARES FAVOURABLY WITH LNG

"LNG is no longer the only option to enable natural gas to be used to displace liquid fuels in heavy duty applications," explains Mr Whiteman.

HDCNG, by comparison with LNG, has a number of attractive characteristics: it is relatively cheap to produce, transport and store, and can be dispensed quickly and automatically at rates equivalent to liquid fuels. It is stable at ambient temperatures, is lighter than air so that it escapes rapidly and harmlessly to the atmosphere in the unlikely event of a release, does not require specialist training and personal protective equipment to dispense, and is universally and competitively available from the network of natural gas pipelines that traverse the country.

Mr Whiteman adds that HDCNG also enables the economic transport of natural gas in trailer-mounted "virtual pipeline" modules, in which HDCNG can be transported to remote locations such as mine sites that are not able to be economically serviced by a conventional pipeline.

"This creates the opportunity for another new market for natural gas to fuel remote power stations and mining equipment, and IntelliGas has commenced discussions with a number of interested mines."

THE CNG GLOBAL REVOLUTION

CNG is emerging as the preferred alternative fuel solution in the USA, as the country seeks to reduce its dependency on foreign oil, reduce emissions from its fleets, and lower the cost of transport by using its vast reserves of indigenous shale gas. There are approximately 112,000 natural gas fuelled vehicles on the road in the USA, with approximately 1,500

INTERESTING FACTS ABOUT HDCNG

- Relatively cheap to produce, transport and store
- Dispensed safely, quickly and automatically at energy flow rates equivalent to liquid fuels
- Does not require personal protective equipment nor specialist safety training to dispense
- Is stable at ambient temperatures, clean-burning, and lighter than air
- Universally and competitively available from the national natural gas pipeline network
- A revolutionary new fuel to displace diesel in heavy duty applications



Clockwise from top: IntelliGas prime mover showing Mark 1 HDCNG fuel pack; First HDCNG station under construction at Crestmead, Queensland; IntelliGas truck in steel delivery service for Darryl Dickenson Transport Brisbane.

CNG service stations across the country and up to 1,000 "behind the gate" in fleet-owned yards. The USA heavy duty truck fleet numbers over 7 million, and is a major consumer of fuel.

"LNG as fuel for large trucks is suffering buyer resistance as, in addition to the challenges of its cryogenic state, the price of LNG doesn't provide sufficient incentive for fleet owners to make the necessary additional investment in the gas engine, on-board LNG tanks, and gas conditioning equipment," explains Mr Whiteman.

"HDCNG will always be cheaper than LNG, and is now poised to become the gas fuel of choice in heavy duty applications."

A BRIGHT FUTURE FOR HDCNG WORLDWIDE

The IntelliGas HDCNG proposed Cool5000™ product lines include on-board fuel storage and management systems for HDCNG fuelled trucks and rail locomotives, and HDCNG fuel storage and rapid-fill dispensing equipment for service stations. These systems are complementary to the conventional CNG storage and dispensing systems that currently exist on service station driveways.

"The IntelliGas patented systems boost and maintain the

additional pressure required for storage and dispensing of HDCNG whilst overcoming the problems that result from heat of compression, friction and gas velocities that normally result from rapid filling fuel tanks with CNG," says Mr Whiteman.

IntelliGas is currently commissioning their first HDCNG gas station in Crestmead Queensland and has three company-owned Western Star T4800 prime movers equipped with Westport HD 525 HP engines running on HDCNG.

"These trucks have travelled tens of thousands of kilometres in a variety of service applications during the technology development phase, and will now be put into regular service in large fleets as demonstration vehicles."

An additional HDCNG service station is planned for the Warrego Highway in anticipation of a demand for HDCNG-equipped trucks from fleet owners servicing the gas fields of the Surat Basin from the Port of Brisbane. Next, a number of service stations are planned on the Hume Highway as HDCNG seeks to fuel the interstate highway fleet. IntelliGas also has an office and workshop in Salt Lake City USA and expects to open the first IntelliGas Cool5000™ USA station later this year, and have demonstration trucks in fleets which run from Los Angeles to Phoenix on Interstate Highway 10.