



NGV Gas (Pty) Ltd
Fuelling Natural Gas Vehicles

www.cng Holdings.co.za

Electric Vehicle Technologies Summit June 2019

WHO IS CNG HOLDINGS ?

THE CNG GROUP OF COMPANIES

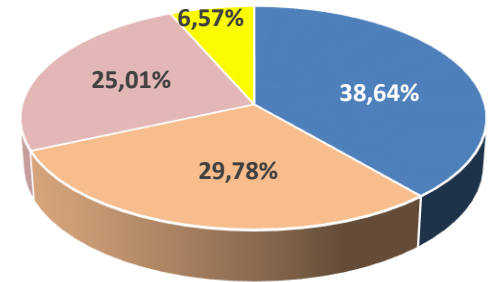


Virtual Gas Network transports Compressed Natural Gas by road to customers who are not on the existing gas pipeline

NGV Gas supplies fleet owners, trucks, taxis and cars with Natural Gas via NGV Gas Filling Stations, retrofits existing traditional filling stations and provides in-house Natural Gas filling facilities

CNG Technology supplies Compressed Natural Gas equipment, advice and support to help industrial users and transport owners convert to Natural Gas. It also converts traditional vehicles to run on gas and services Natural Gas vehicles

SHAREHOLDING



■ IDC ■ Sakhikusasa
■ Reatile Energy ■ Lee Jane Trust

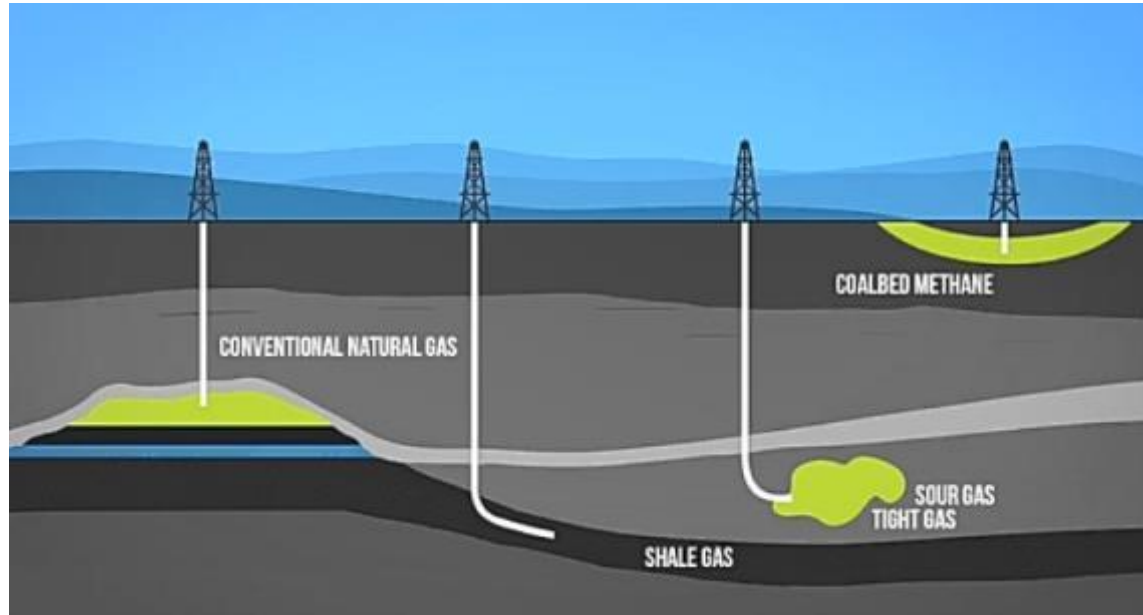
BBBEE status Level 2

89,29% Black Owned Company

www.cngholdings.co.za



WHAT IS NATURAL GAS (NGV Gas sells NATURAL GAS)



One theory is that **natural gas** was **formed** millions of years ago when plants and tiny sea animals were buried by sand and rock. Layers of mud, sand, rock, plant, and animal matter continued to build up until the pressure and heat turned them into oil and **natural gas**. Natural gas pricing is more stable than LPG

DIFFERENCE BETWEEN LPG & CNG

Natural gas

Consists mainly of methane. Methane is lighter than air and will disperse easily should there ever be a gas leak. Natural gas does not change its properties even at high pressure making it safer than LPG.

Liquefied Petroleum Gas (LPG)

Is made up of propane and butane.

LPG is stored in tanks in liquid form and is heavier than air.

LPG collects in low points and is more difficult to disperse than natural gas, and therefore is more prone to ignite or explode if a leak occurs.



HOW SAFE IS NATURAL GAS?



It may come as a surprise to many to hear that natural gas is one of the safest transport fuels available.

Natural gas is a naturally occurring product, consisting mainly of methane (approx. 90%). In its natural state, natural gas is odourless. As a safety measure, the gas is odourised prior to distribution to provide a ready means of leak detection. An average person can easily detect the smell of gas.

Natural gas requires a concentration of between 5% and 15% in air for combustion to occur, meaning in most cases the smell of gas would be detected well before combustion conditions are met. Natural gas also has a high ignition temperature, about 600 degrees Celsius, compared with about 315° C for petrol. Natural gas has no known toxic or chronic physiological effects (i.e. it is not poisonous).

The fact that natural gas is lighter than air further enhances its safety. Unlike other fuels such as diesel or petrol, which are heavier than air, should a natural gas leak occur, the gas will readily dissipate into the atmosphere. This eliminates the risk of the fuel accumulating or pooling at ground level.



ADVANTAGES AND BENEFITS TO CONVERT TO CNG

1. Reduced fuel costs and reduces shrinkage (theft) of fuel
2. Reduced maintenance costs (far less carbon build up in the engine)

Fuel Price Comparison				
	Petrol 95ULP	Diesel 50ppm	CNG	Saving Petrol vs CNG (R- Value)
Jul' 18	R16,02	R14,49	R9,99	R6,03
Aug' 18	R16,03	R14,45	R9,99	R6,04
Sep' 18	R16,08	R14,45	R9,99	R6,09
Oct' 18	R17,08	R15,64	R9,99	R7,09
Nov' 18	R17,08	R16,12	R9,99	R7,09
Dec' 18	R15,24	R14,67	R9,99	R5,25
Jan' 19	R14,01	R13,13	R9,99	R4,02
Feb' 19	R14,08	R13,14	R9,99	R4,09
Mar' 19	R14,82	R14,11	R9,99	R4,83
Apr' 19	R16,13	R14,94	R9,99	R6,14
May' 19	R16,67	R14,94	R9,99	R6,68
Jun' 19	R16,76	R15,27	R9,99	R6,77

Current Filling Station Layout

Inhouse Filling Stations

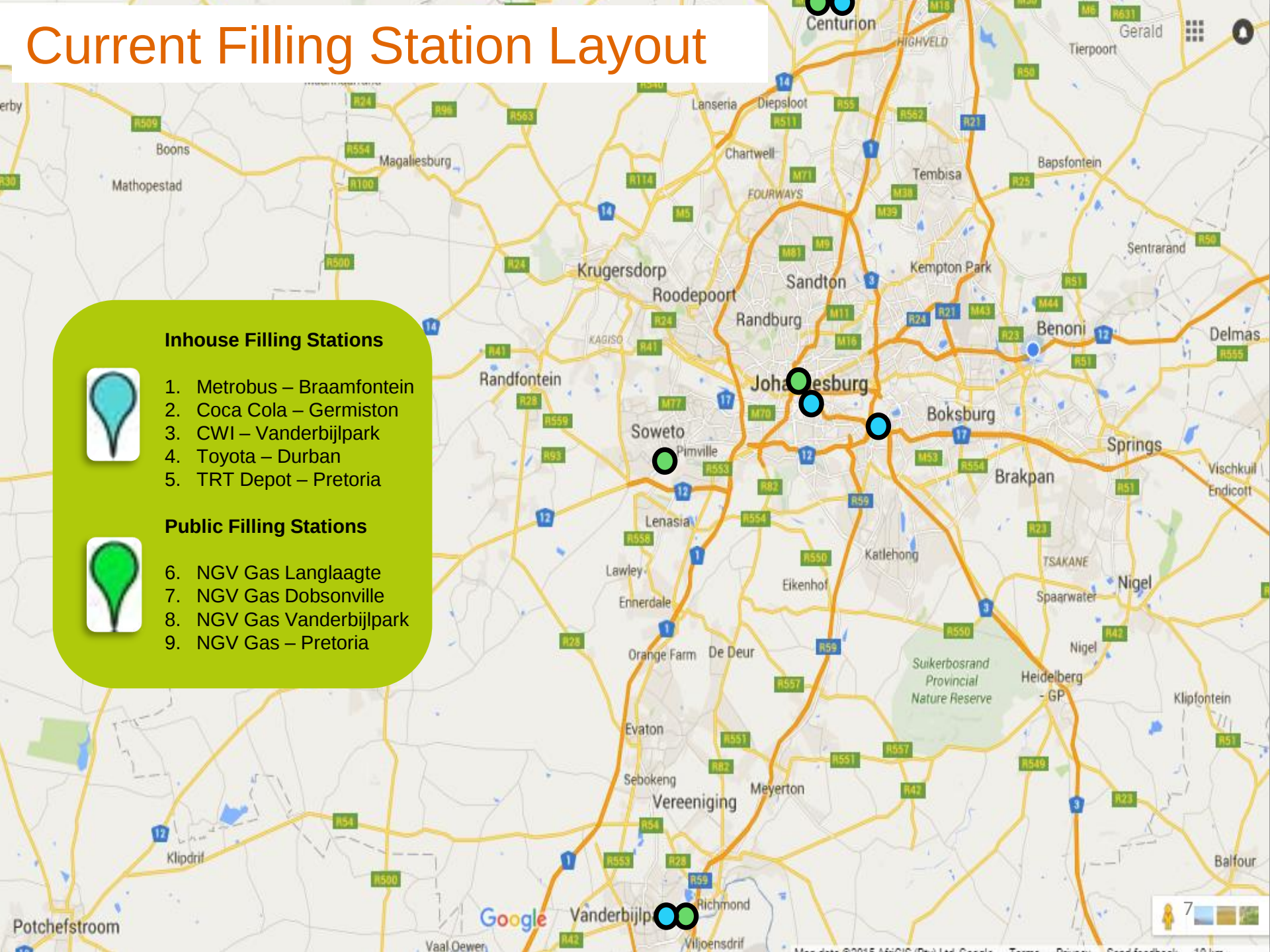


1. Metrobus – Braamfontein
2. Coca Cola – Germiston
3. CWI – Vanderbijlpark
4. Toyota – Durban
5. TRT Depot – Pretoria

Public Filling Stations



6. NGV Gas Langlaagte
7. NGV Gas Dobsonville
8. NGV Gas Vanderbijlpark
9. NGV Gas – Pretoria



PUBLIC FILLING STATIONS

NGV Gas Langlaagte:

71 Main Reef Road, Langlaagte

GPS: 26°12'28.63"S, 27°58'59.94"E

Caltex Dobsonville:

11900 Steve Kgane Street, Soweto

GPS: 26°13'38.11"S, 27°51'12.16"E

Total McBen's Vanderbijlpark:

Cnr Hans Strijdom & General Smuts Str, Vanderbijlpark

GPS: 26°41'50.81"S, 27°50'22.49"E

Quick Fuel Pretoria:

67 Kgosi Mampuru Street, Pretoria

GPS: 25°44'34.32"S, 28°10'48.15"E

Coming Soon

Total Waltloo

Ener-Gi JHB CBD

BP Dobsonville

Engen Robertville



IN-HOUSE FILLING STATIONS

Metrobus Millpark Depot:

Torrance Street, Johannesburg

GPS: 26°11'21.70"S, 28°01'27.04"E

Consolidated Wire Industries:

6 Telford Street, Vanderbijlpark

GPS: 26°39'30.54"S, 27°51'29.14"E

Coca-Cola:

Mullet Street, Wadeville, Johannesburg

GPS: 26°16'07.73"S, 28°11'10.74"E

Toyota:

15 Prospecton Road, Prospecton, Kwa-Zulu Natal

GPS: 29°59'58.47"S, 30°56'02.61"E



NGV GAS VARIOUS CUSTOMERS



INDUSTRIAL CUSTOMERS ON THE GAS PIPELINE IN KZN & GERMISTON



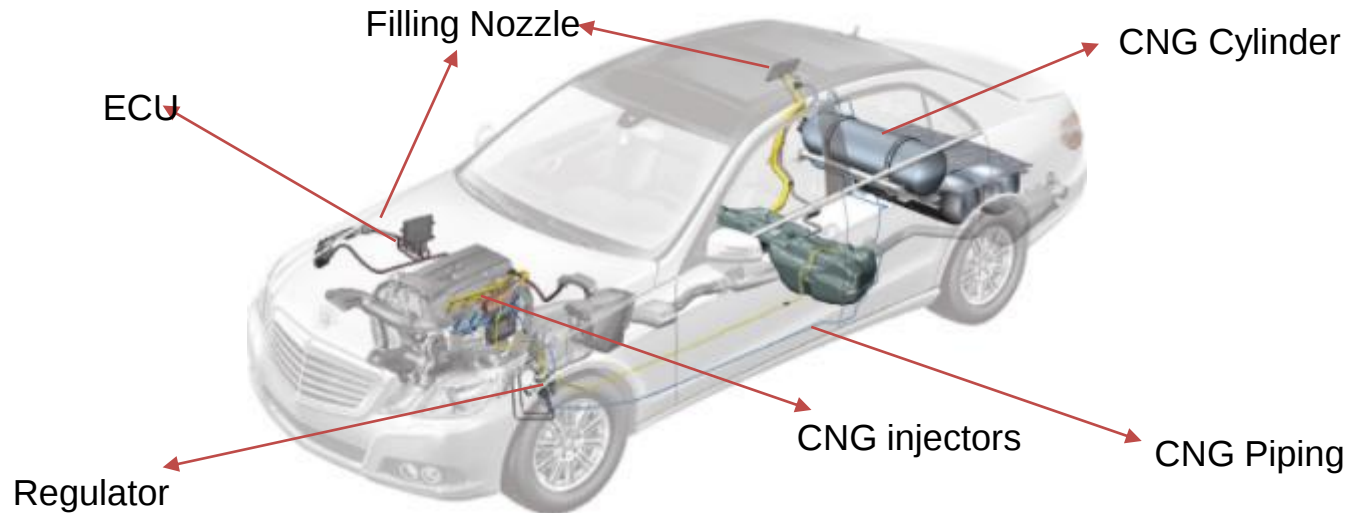
Coca Cola Germiston operating 35 forklifts



Toyota KZN operating 120 forklifts

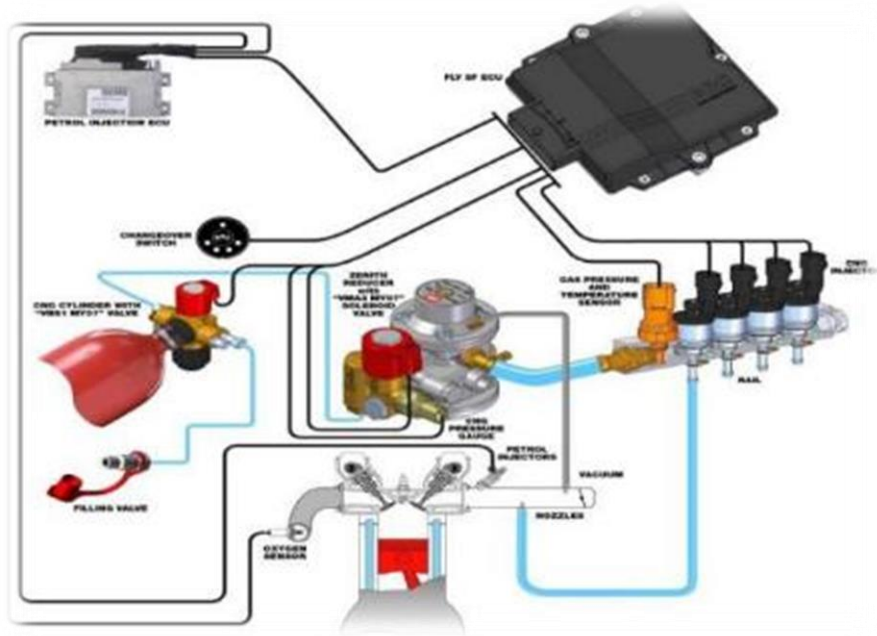


EQUIPMENT IN A VEHICLE



1. **Filling Nozzle** – Used for Filling the vehicle with CNG Gas
2. **Stainless steel Piping with protection** – links the cylinder(s) and all the components in the vehicle
3. **CNG Cylinder** –Stores CNG
4. **Regulator** - Reduces Pressure
5. **Gas Filter** – Filters dirt in the Gas
6. **CNG Injectors** – Injects gas into the vehicles manifold
7. **ECU/ Controller** – Computer box linked to the vehicles computer system
8. **Switch** – CNG level indicator/Selection switch Petrol or Gas
9. **Spark advancer** – used to improve the performance and power of the vehicle.

EQUIPMENT IN A VEHICLE



Natural Gas powered vehicles use Natural Gas instead of traditional fuels such as Petrol or Diesel for propulsion. Natural Gas is stored under pressure (CNG) in a cylinder mounted on the vehicle. The high pressure gas is lowered to a low pressure, via a regulator. The low pressure gas is then mixed with air, and injected into the engine by injector rails, and combusted to supply energy to the engine. This whole process is managed by the ECU.

EQUIPMENT IN A VEHICLE (REAR KIT)

Cylinder(s), Piping, Cylinder Bracket and Cover



EQUIPMENT IN A VEHICLE (INSIDE)



- Switch – To change between CNG and Petrol/ Diesel , CNG level indicator
- Red light means vehicle in petrol/diesel mode
- Green means vehicle in CNG mode
- Orange means vehicle determining between Petrol/Diesel and CNG

Technical characteristics - Dual Fuel Principle

Diesel Dual Fuel (DDF) is a system for the conversion of Diesel engines to work with a mixture of Diesel oil and Gas

Dual Fuel conversion permits to exploit the advantages of CNG to diesel engines with a simple conversion, without being strictly conditioned by the availability of an adequate network of gas filling stations, since the vehicle can always switch back to the original fuel

Natural Gas (NG) is mixed with air flow. Diesel injection is reduced in quantity, and ignites the mixture of air and NG in combustion chamber During operation the system provides and controls the contemporary injection of CNG and Diesel oil in variable percentages according to engine Operating Point The Dual Fuel Engine is capable of running in both modes:

- Diesel mode
- Dual Fuel mode In both modes the combustion cycle is diesel-type



Toyota Hybrid CNG Cars

In collaboration with our partner AGS Auto Gas Systems in Belgium we developed CNG-systems for Toyota Hybrid cars. This means that the car is able to making use of three different types of energy: electric, gasoline and CNG. We call this 'tri-fuel'. When the car runs out of electric battery, the car driver is able to switch to CNG instead of gasoline.

What makes it special?

- + No tax charged (in Belgium)
- + Cheap in refuelling CNG
- + Even more environmentally friendly

The driving range enlarges up to 600 km because of the extra CNG-tanks placed in the storage room. The combination of hybrid and CNG reduces emissions of CO₂ up to 20% compared to gasoline, and particles are reduced by up to 60%.

Toyota RAV4 2.5 VVT-I Hybrid CVT

Toyota C-HR 1.8 VVT-I Hybrid CVT

Toyota Auris touring sports

Article Source: <http://www.prinsautogas.com/articles/en-corporate-2008/Toyota%20Hybrid%20CNG.html>



Toyota Hybrid CNG Cars



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Toyota Hybrid CNG Cars

TOYOTA AURIS
TOURING SPORTS EN 5-DEURS
1.8 VVT-I HYBRIDE CVT ²



5 JAAR
garantie

5 JAAR
garantie

Gemiddelde CO2 reductie 15-20% t.o.v. benzine
NOx gelijkwaardig aan benzine
CO gelijkwaardig aan benzine
HC gelijkwaardig aan benzine
Fijnstof tot 60% reductie t.o.v. benzine

Inhoud 4 x 24 liter/4 kg
Rijbereik CNG ¹: +/- 600km
Totaal inhoud tankpakket: 96 liter/16kg
Verlies van koffer ruimte (koffer ruimte verhoogd met 6 cm)
Bijkomend leeg gewicht (zonder afsluitleg): 50 kg

TOYOTA RAV4
2.5 VVT-I HYBRIDE CVT ²



5 JAAR
garantie

5 JAAR
garantie

Gemiddelde CO2 reductie 15-20% t.o.v. benzine
NOx gelijkwaardig aan benzine
CO gelijkwaardig aan benzine
HC gelijkwaardig aan benzine
Fijnstof tot 60% reductie t.o.v. benzine

Inhoud 5 x 59 liter/9,4 kg
Rijbereik CNG ¹: +/- 400km
Totaal inhoud tankpakket: 117 liter/19,2 kg
Verlies van koffer ruimte (koffer ruimte verhoogd met 8 cm)
Bijkomend leeg gewicht (zonder afsluitleg): 41 kg

TOYOTA C-HR
1.8 VVT-I HYBRIDE CVT ²



5 JAAR
garantie

5 JAAR
garantie

Gemiddelde CO2 reductie 15-20% t.o.v. benzine
NOx gelijkwaardig aan benzine
CO gelijkwaardig aan benzine
HC gelijkwaardig aan benzine
Fijnstof tot 60% reductie t.o.v. benzine

Inhoud 2 x 45 liter/8,1 kg
Rijbereik CNG ¹: +/- 400km
Totaal inhoud tankpakket: 92 liter/16,2 kg
Verlies van koffer ruimte (koffer ruimte verhoogd met 8 cm)
Bijkomend leeg gewicht (zonder afsluitleg): 32 kg

TIRED OF WASTING MONEY ON FUEL?

Converting your existing vehicles to Compressed Natural Gas (CNG) is simple and safe, reducing your fuel costs by at least R4 per litre!

SWITCH & SAVE

COSTS, EMISSIONS, ENVIRONMENT



ASSESS



CONVERTED



SAVE IN UNDER 5 DAYS



Suitable for Petrol and Diesel vehicles up to 360HP

Call 0860 116 917 to book a free assessment

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Questions?



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Thank you