

# **SAVING AMERICA**

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## **1.0 INTRODUCTION**

Oil and subsequently petrol or gasoline and diesel are quickly becoming scarce commodities. Surplus oil production capacity could disappear within two years and there could be serious shortages by 2015 with a significant economic and political impact as per US military report published recently. By 2012, surplus oil production capacity could entirely disappear, and as early as 2015, the shortfall in output could reach nearly 10 million barrels per day.

While it is difficult to predict precisely what economic, political, and strategic effects such a shortfall might produce, it surely would reduce the prospects for growth in both the developing and developed worlds. Such an economic slowdown would exacerbate other unresolved tensions, push fragile and failing states further down the path toward collapse, and perhaps have serious economic impact on both China and India.

The warning is the latest in a series from around the world that has turned peak oil – the moment when demand exceeds supply – from a distant threat to a more immediate risk.

Drilling for oil is now in water depths exceeding 3 kilometres which poses excessive risks of blow outs and consequential major oil spills which has caused major environmental damage. One case in particular is the BP disaster in the Gulf of Mexico which has decimated the largest coastal and estuarine resource system in Louisiana, United States. The oyster, prawn and shrimp, fishing and sports, duck hunting industries have been nearly destroyed.

The use of oil is largely for the production of diesel, gasoline or petrol to power automobiles and trucks. The USA currently imports 20 million barrels of oil per day mainly from the Middle East to fuel the cars and trucks. This causes a tremendous current account deficit



having to pay for this is approximately 0.8 trillion dollars per year or about USD 2,700 for every person in the USA each year.

Middle East tensions have largely been a result of the exportation of the oil to the USA and the need for the USA military presence in these countries to control terrorism and insure the shipping lanes remain open so that our life blood supply of oil reaches us.

The USA like Australia and many other countries has in excess of over 100 years supply of natural gas & methane. Methane is anaerobic decomposition of anything organic, oil, coal, garbage, leaves grass cuttings and manure. In the USA alone there is an estimated 2543 Trillion cubic feet (USA Energy Information Administration) or 21 Trillion equivalent Gallons of gasoline of recoverable methane gas from below ground sources. Based on an annual usage of hydrocarbons for vehicles at about 160 billion gallons per year there is about 130 years supply at present USA vehicle consumption rates. This does not allow for production of methane from the decomposition of organic matter which could one day satisfy all of our energy needs and we would be totally self sufficient and also one day self sustaining.

The world abundance of natural gas is predicted to meet current energy needs for many hundreds of years. The current price on an equivalent gallon of energy basis is 22% to 50% of the price of gasoline in most states. In effect you can fill your car in some states for eighty eight cents per gallon. The price of gasoline is going up and like oil has doubled in cost approximately every ten to twelve years. This rate will only increase and you could be looking at US 12 dollars a gallon by 2020.

In Australia three LNG plants liquefy the methane and supply for export billions of dollars of gas each year to Asia and soon the USA. Australia has fields so large only one field like Gorgon can meet the energy needs of the entire country for 40 years.

CNG stands for compressed natural gas and is the most abundant, safest, cleanest with the smallest carbon imprint of all hydrocarbons and the most economical fuel in the world. It is also capable of being one day fully sustainable. That is we can make it from almost anything



organic all you need is sunshine and carbon dioxide and much less water unlike the manufacture of methanol from corn which was a large failure.

Switching to CNG saves our economy, preserves our current lavish lifestyles we can still own two cars we don't have to start riding horses, saves our international reputation as a kind benevolent country that wants freedom not everyone else's oil, saves our young soldiers lives defending foreign oil interests, and saves our environment. I believe this is what Americans want so we are saving America.

## **2.0 WHO IS OES CNG AND WHAT ARE THEY DOING TO HELP**

Our CEO, Mr. John Lincoln was a young thirty year old American oil and gas engineer that went to Australia in 1980 to help them develop their offshore oil and gas, mining and power generation industries. In 1982 he formed Ocean Engineering Systems which became OES in 1999. In 1992 one of the subsidiary companies, Lincoln Consulting and Ocean Engineering Systems (OES) went International and became world leaders in sub sea pipeline and cable trenching systems and also experts in Marine Terminals.

By 2010 OES which now means Optimum Energy Solutions is registered in five countries and has become a EPC group valued at over 100 million dollars which now specialises in innovative engineering and construction of oil and gas production, loading , storage and power generation and transportation facilities.

OES CNG Pty Ltd is a private company, registered with head office in Melbourne, Australia. The company was founded in 2006 with the specific purpose of stimulating the development of the Natural Gas Vehicle (NGV) market in Australia. To achieve that aim, the company determined to address a range of activities that would facilitate the take-up of NGVs in Australia.

The company has brought together a staff with a range of complementary skills to advance it activities across a broad range of NGV related tasks. Our senior staff bring together many years (over 200 years) of skills in oil and gas EPC activities, electrical and mechanical engineering, NGV technologies (CNG and LNG), and automotive engineering.



As a consequence of this combined expertise, and an investment of several million dollars, our company has established a strong leadership position in the NGV market in Australia. We have opened and operate Australia's first public CNG stations. We have undertaken extensive research and development into aftermarket CNG conversions, and have a product far superior with cleaner emissions and better OBD systems than the two existing American systems offered. We have developed the CNG@HOME refuelling appliance to complement the rollout of the public infrastructure. We offer depot based refuelling solutions for both off road and on road applications; consulting and project management services ranging from fleet analysis to liquefaction or compression and transport of stranded gas reserves, such as Coal Seam or Shale gas.

Starting in Australia in 2006 there was no CNG facilities which was strange as Australia has the worlds largest natural gas supplies, the most economical gas that cost less than 20 cents a litre, one of the highest petrol or gasoline prices, 150 per litre (560 per US gallon) and has probably the highest environmental and safety standards in the world. When we approached people and companies the response was "Well if it is so great why isn't everybody else doing it"

John having a huge ego and very motivated by challenge realised that he was going to have a big road to plow and also was going to have to play God a little as since there was no CNG fuel and no CNG vehicles it was the chicken or egg scenario and he was going to have to invent both the chicken and the egg. OES then developed filling stations and converted cars and also spent four years developing a small economical home fill compressor that is patented in the USA and the technology so far advanced unmatched any where in the world . In the USA there was a product by Fuel Maker that took 12 hours to fill a car and it had a usage life of less than 1000 hours. With a product like that they went out of business of course but deserve ample credit for being the first to develop a fundamentally new concept. OES compressor on the other hand sells for less money and can fill a car in four minutes and has a unlimited usage life.

## **2.1 The USA and the changes that need to be made and what OES is helping make**

John toured the USA in 2010 and realised the USA was way behind Australia in a sense in



that the laws ,government requirements and gas companies actions were largely unproductive.

EPA laws made it almost impossible for companies to convert their cars to run on gas and the ignorance of road authorities in California that only allowed dedicated CNG cars not bio or dual fuel cars to use the express lane also hampered progress. As a result there were no dual fuel conversions being done only dedicated CNG vehicles and by after market large companies charging a fortune. The public did not want to convert their cars as they were afraid they would run out of fuel with the limited availability of CNG stations. OES on the other hand does a dual fuel conversion in that the car runs on gasoline or CNG. The conversions are the cleanest in the world and have complete diagnostic response for both fuels by the on board computers and are also about a third of the cost of the two existing after market USA converters.

Another problem for the USA is the government regulated gas companies have not figured out how to reach the market they do not advertise as they are not allowed to. In addition they put up unfriendly unmanned CNG stations that frighten customers away. The AGA wanting to sell gas and wanting the three big American car makers to manufacture CNG cars and free issue home fill compressors also have ridiculous mandates in that they thing you can make a reliable safe compressor that fits in the trunk of a car and that people will wait 12 hours to fill their car.

John already being successful in Australia swaying the government to his way of thinking helped the USA situation and successfully lobbied the Obama administration to help repeal the old unproductive EPA requirements which have now changed allowing easy economical dual conversions on cars older than two years.

OES believes America has grown up since his last visit May 2010 and will be offering franchise agreements to American companies to convert cars using OES conversion systems, engineering and installation of CNG filling stations and manufacturing of home refuelling compressors in the USA.



### **3.0 THE OES HOME CNG REFUELLING APPLIANCE INVENTION**

The purpose of this invention is to provide a very safe and reliable small CNG compressor that allows people to fill their cars at home using natural gas that is used in the home for heating and cooking. OES CNG a small company is a pioneer in this field and has spent millions in the research and development of CNG systems including, car conversion kits, CNG commercial filling stations and now CNG home compressors.

Over three years has been spent testing and perfecting these Inventions and now has home refuelling compressors that run for up to 2000 hrs without maintenance.

There are other home refill CNG compressors on the market but most have failed within a few weeks of operation, have been too slow taking up to 10 hours to fill a car or are not safe.

The invention is the unique features of a process of compressing natural gas. The natural gas is compressed in a three stage reciprocating process and stored directly in high pressure storage cylinder located either in the car or adjacent to the compressor.

The system is a closed loop system in that no gas is lost to the environment under normal operation. For example upon filling a cylinder in a car the gas in the fill hose is discharged into a blow down vessel which is recirculated upon initial start-up back to the compressor.

During compression in the three cylinders depending upon the gas quality there can be a build up over time of liquids including small traces of water and oils. These liquids must be drained to avoid damage to the cylinder from over pressurisation. This is accomplished periodically with an automatic opening of a control valve controlled by the micro compressor.



**The unique features patented here are described below:**

- 1) A direct drive brushless DC motor is used that has a slow start controller and so is very energy efficient and reduces the risk of a locked rotor which can start a fire, and also eliminates drive belts which are prone to failure.
- 2) A highly sophisticated self-diagnostic controller and shut down microprocessor that does the following:
  - a. Reports faults by internet to OES CNG.
  - b. Remote monitoring.
  - c. Automatic shutdown for various faults with a display indicator of the problem.
- 3) A large oil reservoir with filtration including magnetic that allows to 2000 hours of maintenance free operation.
- 4) A 3000 hours (3 years operations) maintenance system that can be done onsite. That does not require the unit to go the shop.
- 5) As an option, the inclusion of 2 storage bottles and all the necessary and valving and automatic controls that allow a car single storage bottle to filled 75% in only a few minutes.
- 6) A filling hose breaking scenario fault which causes automatic shutdown.
- 7) Temperature compensated filling systems that fills bottles to only 200 bar when the ambient temperature is -15 degrees to 230 bar when the ambient is 40 degrees.
- 8) A break away coupling that also closes the fill line should a careless driver drive away while still connected to the fill hose.
- 9) A gas leak detection sensor that triggers the automatic shutdown.

10) A robust compressor shaft Deep Groove ball bearing system allowing 6,000 hrs of continued use before replacement.

#### **4.0 OTHER ALTERNATE FUEL SYSTEMS**

There are other alternate automotive fuel systems that may help save America but will not have the same fundamental effects. The relative merits, and limitations are discussed briefly.

##### **4.1 Biofuels – Ethanol and Biodiesel**

These fuels have been unfairly represented as a major solution to the inevitable fuel crisis. In the USA it was tried to be produced from corn several years ago. The effort caused such a high inflation in the price of corn that our Hispanic brothers to the South could not afford to eat. It was finally abandoned. In the end the price was also too high. In addition enormous amount of water is required in the process making it a totally ineffective except in tropical and subtropical climates which the USA has a limited amount of. The Brazilians have had good success using sugar cane in making a cost effective product but their automotive engines are known to not run well on this fuel and it limits the engine life.

##### **4.2 LPG**

LPG or Propane and Butane is removed from Oil to lower the reed vapor pressure to make oil safer to refine into gasoline. It is therefore a bi product of oil and an unsafe one at that. It is sometimes used in the USA for gas for homes for cooking and heating where much safer and cleaner methane is not available.

It was popular in Australia as it was marginally less expensive, about 30% less than gasoline and relatively abundant with the oil companies not really having much of a market for it. Only 5% of the automotive market switched to it as mainly there were government subsidies which no longer exist. It is also a very dangerous fuel a container can easily explode from the slightest contact with a sharp steel object creating a dangerous floating boiling liquid expanding vapour cloud (BLEVC) that can burn everything in its path.

##### **4.3 Hydrogen**

Hydrogen fuel cells in the automotive industry may one day be viable but not for the foreseeable future. Hydrogen is expensive to make from the electrolysis of water and requires



large amounts of electricity. So if electricity generated from nuclear or Coal fuel is produced at least it is independent of oil. Storage of Hydrogen is also a problem since it is the smallest molecule it can literally diffuse through anything. Natural gas is 80% hydrogen anyway.

#### **4.4 Hybrids**

Hybrids are great technology using the battery at low speeds being more efficient and also use the electrical motor in reverse as a break and also helps charge the battery. Both of these features represent excellent technology to reduce energy consumption. Current models use petroleum as primary power source but could be more effective with CNG engine rather than petrol. Battery cost and life however is a significant issue.

#### **4.5 Fully Electric**

Electric cars are a great idea but to make electricity somewhere you usually need to burn something if that is oil there is no value as the transition of the electricity costs power and so there is nothing gained in fact more is lost. If the electricity is from a gas fired boiler same inefficiency applies and it would be better to use CNG. If from a coal or nuclear fired boiler it would reduce oil demand. Similar concerns to hybrids regarding battery life and cost. Also not good for driving long distances.

