

# *Proposal for a*

## **CNG-BASED**

### **TRANSPORTATION AND ENERGY SOLUTION FOR DELTA STATE**



**Proposed by  
Origin Innovation**



## 1. Executive Summary

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The Delta State Government seeks to promote a sustainable, economically viable, and environmentally responsible transportation and energy ecosystem. This proposal presents a Comprehensive Compressed Natural Gas (CNG) Transportation and Infrastructure Development Plan, including the procurement of modern CNG mini buses for inter-city commuting and goods transport, the establishment of refueling and maintenance infrastructure, training programs, and an economic model that fosters private sector participation.

This proposal offers Delta State a roadmap to significantly reduce greenhouse gas (GHG) emissions, lower transportation costs, create employment, stimulate the local economy, and generate long-term revenues for the state.



## 2. Project Objectives

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- Facilitate the transition from diesel/petrol-based to CNG-based public transport.
- Establish a robust CNG refueling and maintenance ecosystem across Delta State.
- Reduce transportation costs for citizens and businesses.
- Generate long-term revenue through commercial operations.
- Create jobs in logistics, infrastructure, operations, and training.
- Reduce Delta State's carbon footprint and meet national environmental targets.

### **3. Project Scope and Components**

#### **A. Procurement of CNG Vehicles - Type:**

Modern 35- to 40-seater CNG city buses -  
Quantity: 300+ buses (phased over 10 years) -

**Use Cases:** - Urban and rural inter-city  
commuter transport & Last-mile goods  
transportation



#### **B. Infrastructure Development -**

Establishment of at least 10 CNG refueling stations (Asaba, Warri, Sapele, Ughelli, Agbor, Ozoro, Oleh, Koko, Patani, and Abraka) -  
Centralized maintenance and operations  
depots - Mobile servicing and diagnostics units



**C. Technology Integration** - GPS tracking  
and fleet management systems - Passenger  
fare systems (smartcards, QR, USSD  
payments) - Data analytics dashboard for  
state government oversight



**D. Capacity Building** - Driver/operator  
certification programs - Technical training for  
mechanics and station attendants - CNG safety  
and emergency response training

#### **E. Public-Private Partnerships (PPP) -**

Concession agreements for refueling station  
management - Local OEM partnerships for  
bus assembly (to reduce CapEx and stimulate  
local industry).

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## 6. Revenue Generation Model for Delta State

### Revenue Streams:

**1. Passenger Fare Collection:** Daily fare average of ₦300/passenger @ 50 passengers/bus/day for 50 buses. - Monthly = ₦300 x 100 x 22 x 50 = ₦33 Million - Yearly = ₦396 Million

**2. Fuel Sales Commission** from PPP stations:

- ₦20/kg commission × 40 kg/day per bus × 50 buses = ₦1,200,000/month
- Yearly = ₦14,400,000

**3. Advertising on Buses:**

- ₦50,000 per bus x 50 = ₦2.5 Million/month
- Yearly = ₦30,000,000

**5. Fleet Leasing (Private Hire):**

- Estimated at ₦5 million/year

**Total Estimated Annual Revenue: ₦445.4 Million**



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## 7. Funding Sources

- **Public Funding:** Initial 30% from state infrastructure budget
- **Private Sector Investment:** Up to 40% through PPPs (stations, fleet leasing, advertising rights)
- **Development Finance Institutions (DFIs):** World Bank, AfDB, Nigeria Sovereign Investment Authority (NSIA)
- **Green Bonds:** Climate-aligned bonds via state infrastructure fund
- **OEM Financing:** Partner with OEMs for phased repayment plans for CNG buses.



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## 9. Risk Mitigation and Financial Management

- Set up an independent CNG Transport Management Agency (CTMA)
- Establish an escrow account for fare and lease revenues.
- Implement insurance and maintenance contracts for fleet uptime.
- Revenue tracking via digital fare collection and GPS data
- Inflation-adjusted fare policies with government oversight

## 8. Demographic Context and SWOT Analysis Population Estimates (2022 reference):

Location	Estimated Population	Notes	Strengths	Weaknesses
Asaba	~150k city core (~500k metro)	Administrative capital	Low-cost, clean energy transit model	Initial CapEx burden
Warri	~364k city	Oil & commerce hub		
Metro Sapele	(~1.04M metro) ~238k	Port town, industrial base	Government support for PPP model	Fuel infrastructure is nascent
Ughelli	~780k	Trade & transport hub	Job creation across sectors	Skilled personnel shortage
Agbor	~300k	Education & agriculture		
Ozoro	~186k	Polytechnic & SME center	Opportunities	Threats
Oleh	~130k	Oil-bearing community	Access to green financing	Fuel supply volatility Stakeholder resistance
Koko	~115k	River port access		
Patani	~95k	Gateway to Bayelsa	OEM partnerships for local assembly	Policy inconsistency
Abraka	~100k+	University, ecotourism	Digital integration & transparency	

**Demographics:** Predominantly youth under age 35; high demand for affordable transport; concentration of commuters, traders, and students.



A partnership to facilitate  
affordable transportation in  
Delta State



## 9. Conclusion & Recommendation



Delta State is strategically positioned to lead Nigeria's CNG transition through this comprehensive, revenue-positive, job-creating transport and energy project. With phased implementation, multi-source funding, and technology-backed governance, this project can transform the transportation and economic landscape of the state within a decade.

We recommend a Project Steering Committee be set up to initiate Phase 1 feasibility, investor engagement, and pilot bus deployment within the first 6 months.



For inquiries or partnerships, contact us today via these contact details :



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# ANNEXES

TABLES, CALCULATIONS, SAMPLE PHOTOS, ETC.



01



## CNG Filling Station

The gas in the natural gas pipeline is generally purified by a pre-installation device to remove the sulfur and moisture in the gas, and then the pressure is compressed from 0.1-1.0MPa to 25MPa by a compressor, and finally the vehicle is filled with gas through a gas vending machine. Compressed Nature Gas is the most ideal alternative fuel for vehicles, and its application technology has become increasingly mature after decades of development.

## CNG Filling Station

A CNG filling station refers to a place that provides fuel in the form of natural gas (CNG) to natural gas vehicles (Nature Gas Vehicles) and large CNG station vehicles.



02

### Part 01

#### Low cost, high benefit

Using CNG can save fuel costs and reduce transportation costs. 1 cubic meter of natural gas is equivalent to 1.1-1.3 liters of gasoline.

### Part 02

#### Reduce Carbon Emission

Using CNG instead of gasoline as vehicle fuel can reduce CO emissions by 97%.

### Part 03

#### Safe and convenient

CNG is higher safety than fuel. The auto-ignition temperature of CNG is 732 °C, and the auto-ignition temperature of gasoline is 232~482 °C.

## Types of CNG Filling stations

CNG mother station takes gas directly from the natural gas pipeline, and the incoming station pressure is 1.5-4Mpa. After desulfurization, dehydration and other processes, it is compressed by a compressor, and then transported by tanker to the sub-station to refuel cars. He also built a conventional station on the road. Function. The mother station is mostly built near the city gate station, and the gas filling capacity of the mother station is between 2500- 4000Nm<sup>3</sup>/h (standard cubic hour).

CNG  
Mother

CNG daughter stations are built in places where there are no natural gas pipelines around gas stations. They are generally built in cities to facilitate vehicle refueling, or in township industrial areas where there are no gas pipelines to supply natural gas as energy. The mother station uses a compressor to pressurize and store natural gas, and then a special transport vehicle transports 20Mpa compressed natural gas to the sub-station, which then refuels CNG vehicles.

CNG  
daughter  
station

The mobile CNG filling station can be easily moved to any locations. Flow capacity range from 600-4000Nm<sup>3</sup>/h, e.g. for a 2000Nm<sup>3</sup>/h MRU with two dispensers, to refilling 4 units CNG bus or CNG vehicle at same time.

Mobile Skid  
mounted CNG  
filling station

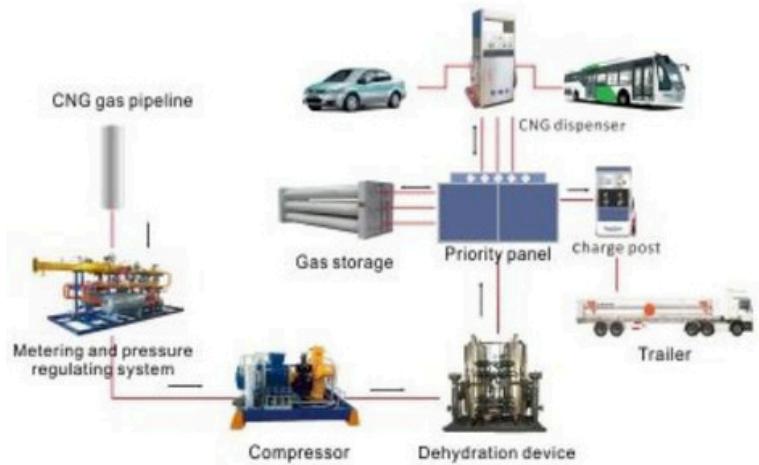


## CNG Mother station

Main configurations:

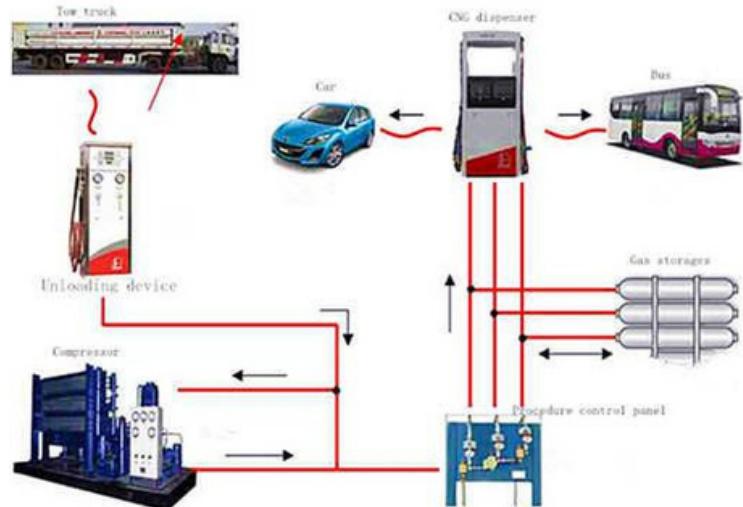
- CNG gas pipeline
- Metering and pressurization system
- Compressor
- Dehydration device
- Priority panel
- Storage system
- CNG dispenser
- Unloading device

## CNG mother station



## CNG Daughter station

Main configurations: CNG trailer  
Compressor  
Dehydration device  
Priority panel  
Storage system  
CNG dispenser  
Unloading device



# Mobile Skid Mounted CNG filling station

(Ready to plug and play)

Mobility – can be easily moved to any locations

Easy deployment.

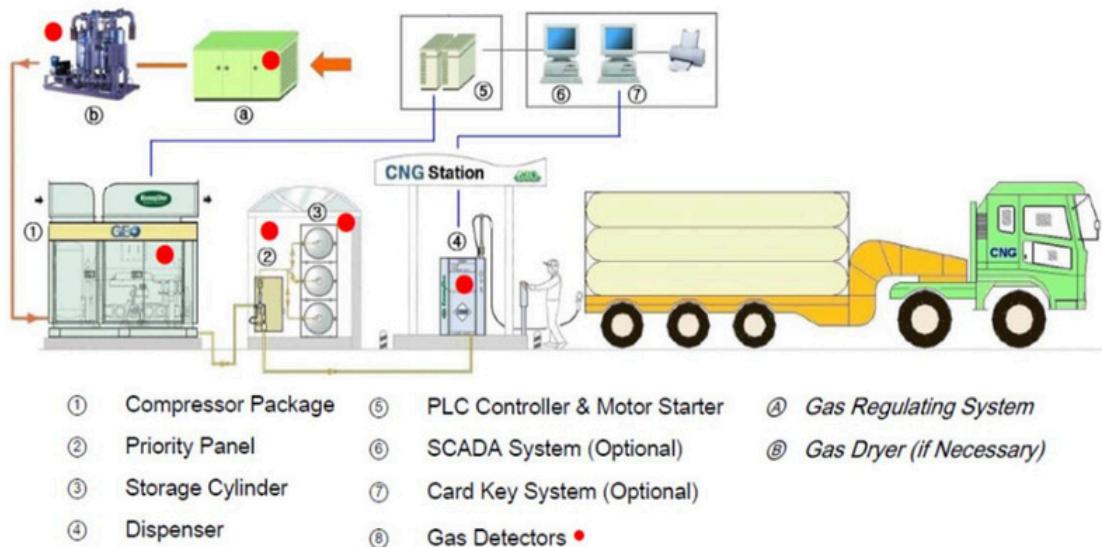
Can be used for multiple applications providing numerous high revenue opportunities.



# Proposal for CNG Mother Station

Configuration plan: The inlet pressure of natural gas is 1~15MPa, and system equipment such as 1~2 natural compressors (single unit displacement is ~2500Nm<sup>3</sup>/h) is used. It operates for 20 hours a day and can build a daily gas supply capacity of 100000 Nm<sup>3</sup>/ d CNG filling station.

Mother Station



## Cost of main equipments of CNG Mother Station

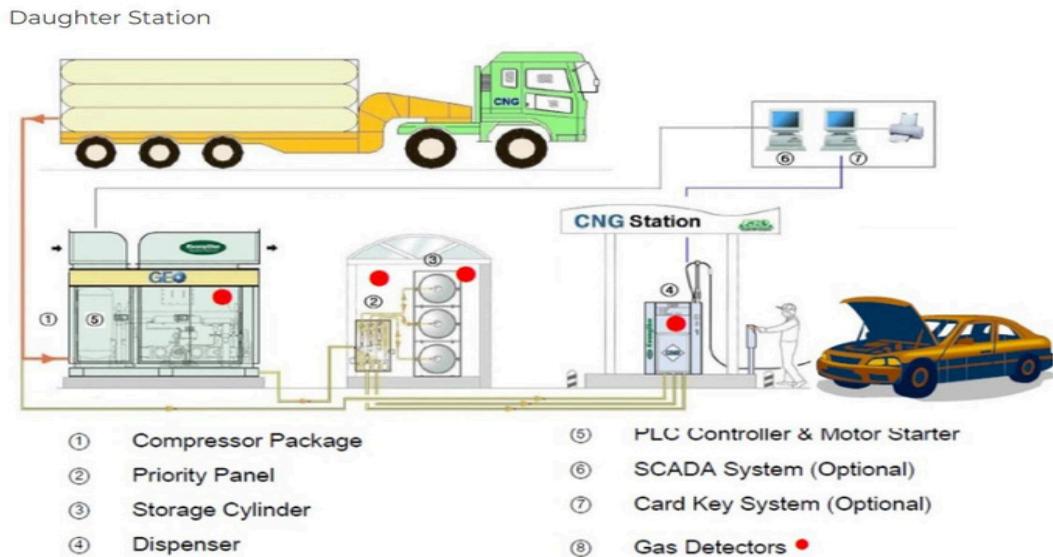
Approximate budget for process equipment:

Seriel No.	Item	Scope of supply	Unit	QTY	Unit Price Exw Factory (usd/set)	Total Amount Exw Factory (USD)
1.	air intake system	1 air intake separation buffer tank (including safety valve, pressure gauge, anchor bolts, etc.)	set	1	39,600.00 usd/set	USD39,600.00
2.	Regeneration drying system (2500Nm <sup>3</sup> /h)	Adsorption tower, imported gas-liquid filter, export dust filter, air cooler, gas-water separator, electric heater, PLC temperature control system, electric heating power, ball valve, blowdown valve, adsorbent	set	2	39,600.00 usd/set	USD79,200.00
3.	Natural gas compressor and control system	The main engine and auxiliary machines (such as coolers, separators, etc.) from the first-level inlet valve to the exhaust one-way valve port of the next stage; the vent main pipe to the pipe mouth (including safety valves at all levels, vent pipes at all levels, Air leakage recovery pipe); explosion-proof motor (KW/380V), etc.; the whole is installed on the bottom skid. PLC control cabinet (standard signal transmission, touch screen (10') display, soft start)	set	2	143,000.00 usd/set	USD286,000.00
4.	Exhaust gas collection system	Recovery tank (m <sup>3</sup> , working pressure MPa), sewage tank (1m <sup>3</sup> , normal pressure), safety valve, pressure gauge, anchor bolts, etc.	set	1	8,250.00 usd/set	USD8,250.00
5.	Gas filling system	Single gun gas filling column, flow range (1-40m <sup>3</sup> /min), mass flow meter and various ball valves, pull-off valves, solenoid valves, LCD digital display.	towee	2	13,400.00 usd/set	USD26,800.00
6.	Total amount					USD439,850.00

Note: This equipment estimate is for reference only and will be adjusted accordingly after the technical parameter requirements of the CNG filling station are determined.

# Proposal for CNG Daughter Station

Configuration plan: CNG daughter station brings the advantage to provide gas in areas where pipelines are not present, keeping unchanged the safety and reliability of the system in order to respect all the international standards. CNG daughter stations can work with a maximum pressure of 250 bar and they are able to meet all requests of downstream pressure needed to more common applications on the market.



# Proposal for Mobile Skid Mounted CNG Filling Station

Configuration plan: This solution is developed and manufactured based on our company's original compressed natural gas refueling substation. It is a skid-mounted and relatively movable natural gas refueling substation for refueling CNG vehicles.

Production capacity:

Hourly processing capacity 1500Nm<sup>3</sup>

Daily processing capacity 15,000 Nm<sup>3</sup> (calculated based on 10 hours of operation per day)

Can satisfy 400-600 taxis or 150-250 buses with normal gas filling



## Cost of main equipments of Skid Mounted CNG Filling Station

No.	Name	Picture	Description of goods	Unit price EXW Factory (USD/unit)	Qty(Unit)	Amount(USD)
1	SINOTRUCK 6X4 TRACTOR		HW79 cabin, one sleeper, with air conditioner; T12.42-50.420hp, Euro II, 11.6 L displacement, inline six-cylinder, water-cooled, four-stroke, inter-cooled turbocharged, 7400x2550x3850mm 6x4 tractor with 8x150L Cylinder	US\$64,680.00	1	US\$64,680.00
2	12-tube CNG Skid-2450L		ISO11120 Cylinder-design.structure and test of seamless and reusable steel tube with a capacity between 150 L to3000 L. ISO668 Classification,dimensions and ratings of series 1 container; 12192x2438x2000mm, 2450L	US\$113,000.00	2	US\$226,000.00
3	3 Axle 40 ft Flatbed Trailer		12500*2480*1450mm; 3 Axle 40 Ft Flatbed Trailer; 3*13 tons Axles; 12R22.5 Tire,12 pcs	US\$14,600.00	2	US\$29,200.00
4	CNG sub-station unit		CNG sub-station unit includes: compressor, PLC control cabinet, gas storage pipe bundle, sequence panel, unit box; PLC single-machine tank (LCD, transfer by electrical signal, soft start ); Inlet pressure: 3.0~20.0 MPa Outlet pressure: 25.0MPa Average displacement: 1500Nm3/h Compressed gas oil content:	US\$126,470.00	1	US\$126,470.00
5	CNG dispenser		CNG double-gun dispenser; Weight: 350KGx7=2450KG; Power: 132w; Size: 1100x 590x 2230mm	US\$12,500.00	2	US\$25,000.00
6	CNG loading/unloading device		Pure electric pickup with single cabin, 3380x1550x1500mm , 34.57KWH Ternary lithium battery; Max. Speed: 100km/h; 405KM WLTP range	US\$8,390.00	1	US\$8,390.00
<b>In Total</b>						<b>US\$479,740.00</b>