



The Clean Air Group
Driving the Future

Landi Renzo Group
NGV India Delhi May 2019








Agenda





















➤ **Landi Renzo Group at a glance**

➤ Natural Gas Market in India – Our View

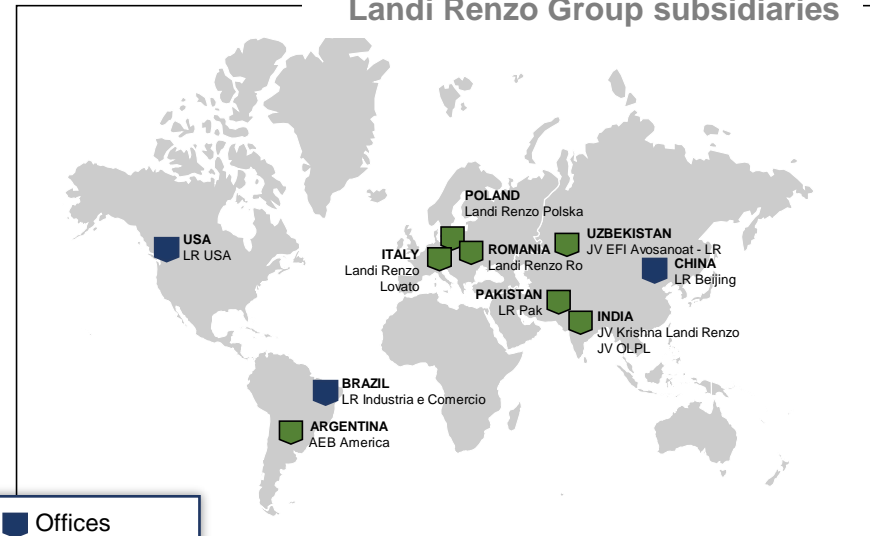
➤ Landi Renzo Strategies in Natural Gas Vehicles – Global and Indian Market View



Landi Renzo Group designs, produces and distributes at worldwide level highly advanced integrated solutions, from gas distribution infrastructures to alternative fuel systems

Automotive sector		Infrastructures
OEM	After Market	Natural gas distribution and compression
 <ul style="list-style-type: none"> • Full CNG and LPG systems • LPG, CNG and LNG components • R&D to support Alternative Fuel evolution 	    <ul style="list-style-type: none"> • Full CNG and LPG conversion kits • Components and systems for CNG and LPG conversion • Diesel Dual Fuel technology for Bus&HD 	  <ul style="list-style-type: none"> • Landi Renzo owns 51% (49% owned by Clean Energy Fuels, NASDAQ: CLNE) of the Joint Venture • Equipment for Biomethane and CNG infrastructure • Ready to enter LNG distribution business

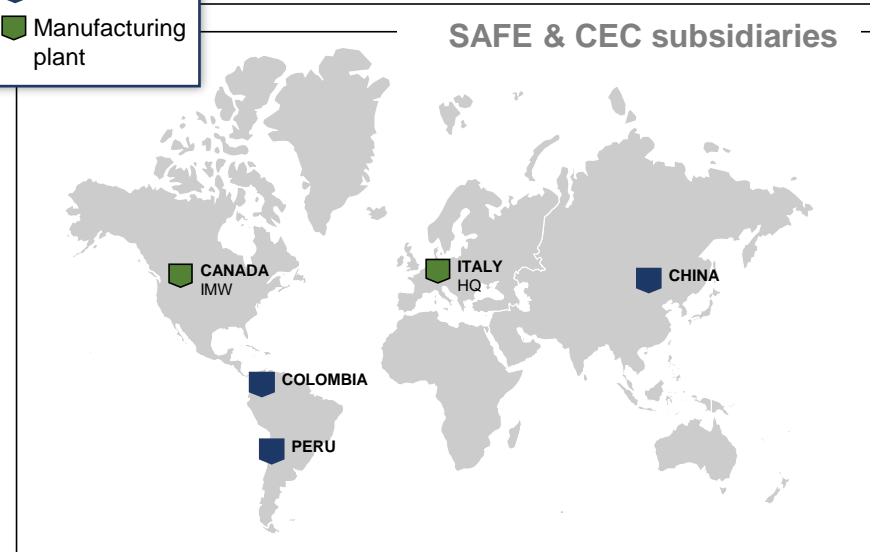
<ul style="list-style-type: none"> • World largest OEM Tier 1 supplier          	<ul style="list-style-type: none"> • More than 300 distributors and 4000 workshops worldwide • Partnership with Uber in Brazil to convert drivers' cars 	<ul style="list-style-type: none"> • Installed base of more than 5500 compressors         
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Landi Renzo Group subsidiaries



 Offices
 Manufacturing plant

SAFE & CEC subsidiaries



Landi Renzo Group “G-Mobility Way” integrated Strategy embraces all Alternative Gas Fuel to concretely make real transportation decarbonization

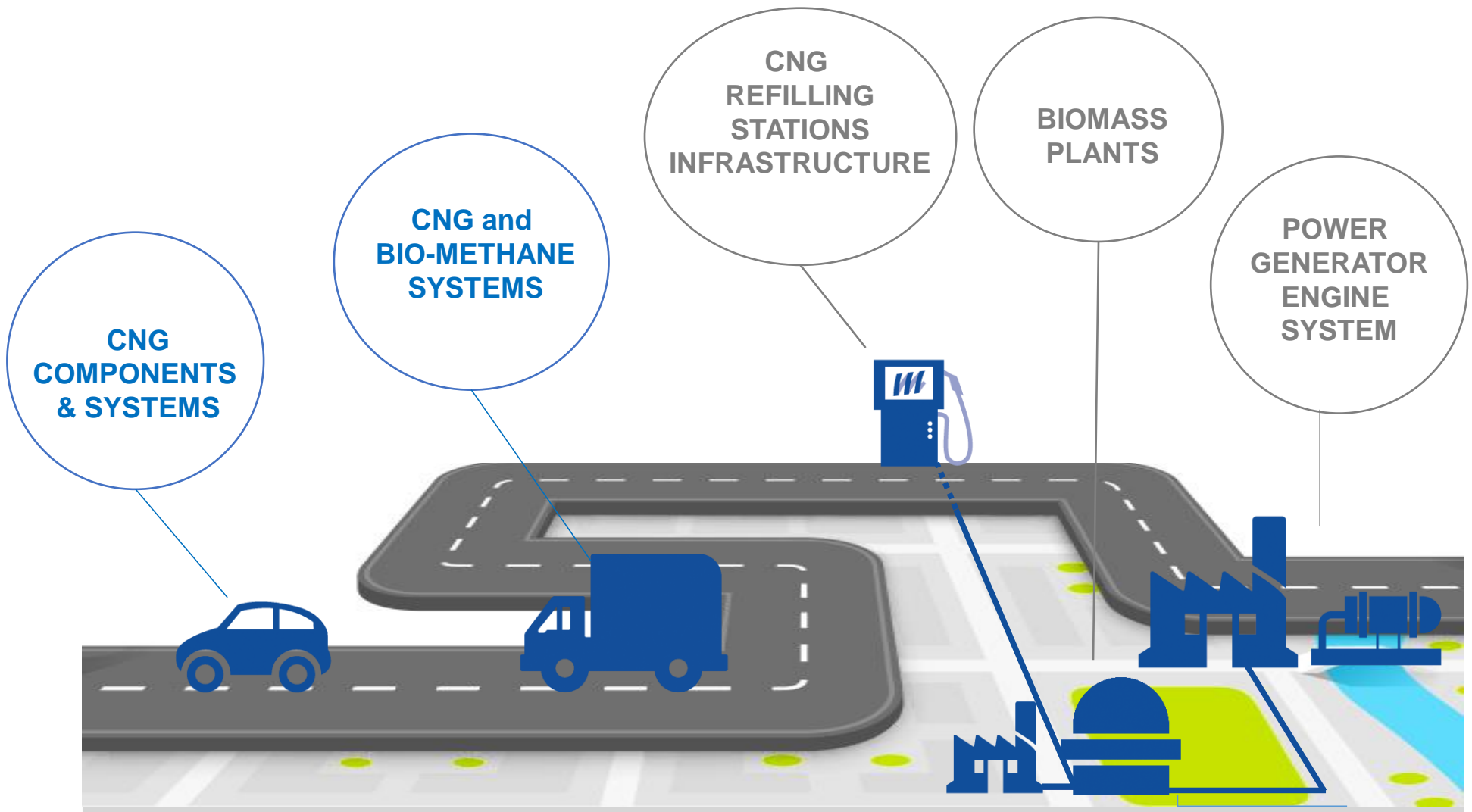
“G-Mobility Way” is the Forward Looking Integrated Strategy to make Landi Renzo Group providing full alternative fuel solutions for supporting transportation decarbonization



Integrated Portfolio for providing **Passenger Cars and Heavy Duty**

- **Components**
- **Full Solutions**
- **Vehicle solution integration services**

... fully covering CNG solutions from well-to-engine

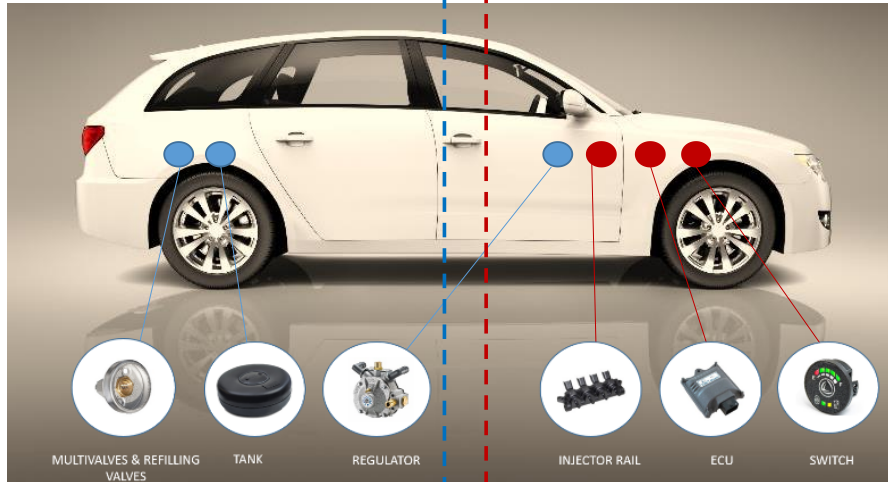


LRG produces and sells Natural Gas bi-fuel conversion solutions for passenger cars and mono / dual fuel solutions for Mid – Heavy Duty vehicles

Passenger Car – CNG and LPG

High Pressure

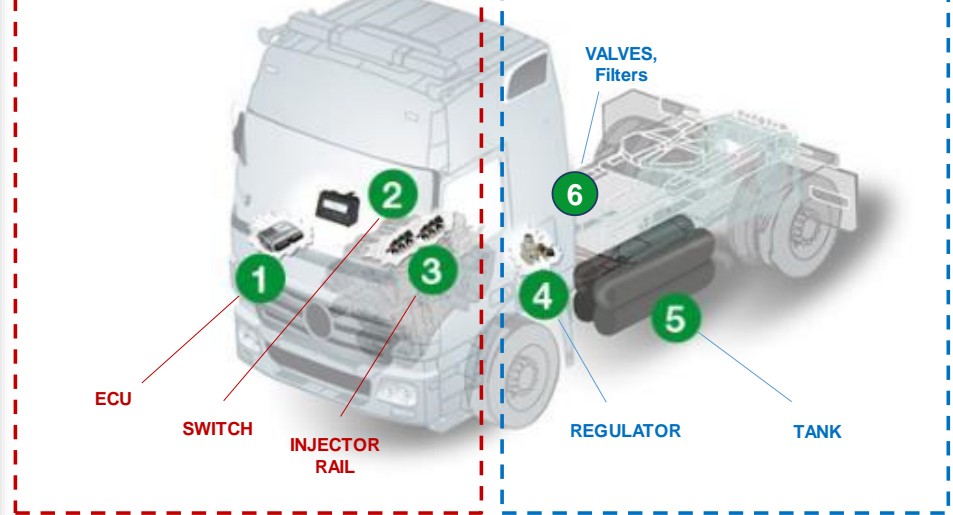
Low Pressure



Heavy Duty – LNG & CNG

Low Pressure

High Pressure



- Landi Renzo Group's Product Portfolio covers all **Natural Gas conversion solutions** (CNG, LNG and LPG):
 - **systems and components**
 - supporting **passenger cars, medium & heavy duty and off-road vehicles**
 - and for **OEM Market** and **AfterMarket Market applications**

Safe-CEC produces and sells CNG compression's applications for CNG and RNG, starting to enter into LNG

CNG Infrastructure



High flow rate CNG stations for trailers. Solution based on heavy duty compressors, high efficiency and performances. Driven by EM or GE.



Mechanical or hydraulic compressors are suitable for daughter stations to meet the customer needs.



Turn-key equipment for trailer installations that doesn't need external power supply.

Application for RNG



Raw gas booster for biogas boosting integrated in the upgrading plant able to manage very low pressure. Special materials suitable for wet and corrosive gas applications.



Grid injection Compression system able to work with all different biogas upgrading plant in term of technologies and performances. Heavy duty compressors suitable for 24/7 applications.



RNG stations for trailers refilling and public or private fleets. Solution based on heavy duty compressors for the highest performances and efficiency. Driven by electric motor with variable speed.

Landi Renzo, thanks to the Krishna India Joint Venture, has been able to successfully provide direct service to local OEM Market

Krishna Landi Renzo India Pvt Ltd



Highlights

- Successful, trust-based partnership, thanks to a solid management of the JV and joint efforts of the shareholders
- Well-established relationship with Maruti, ensuring a high turnover potential in the future

Product Portfolio⁽¹⁾

Passenger cars

Three Wheelers

- NG - Regulators
- Receptacles
- Valves / receptacles



(1) Manufactured in India and in the other LRG manufacturing plants

Landi Renzo Group has targeted Indian Market from the beginning owning proven capabilities to support NGVs penetration increase ...

1

Fully Integrated CNG Product Portfolio

- Landi Renzo Group owns the complete product range for CNG vehicles production (OEM) and conversion (AfterMarket) – Passenger Cars
- We already have the main high & low pressure system components for CNG Mid & Heavy Duty Vehicles
- We have also the global experience for managing “0Km” conversion both for OEMs, Importers and Distributors

2

Local Presence (Commercial & Manufacturing Plant)

- Landi Renzo Group owns, through a JV with Krishna Maruti Ltd, fully equipped manufacturing local plant for locally producing, assembling and assisting (post sales support) all the most important CNG components
- Krishna Landi Renzo India Pvt Ltd JV is located in Gurguram from 2012 serving all the main Indian OEMs

3

Large Indian Customer Base

- Landi Renzo Group owns a large customer base in terms of OEMs (Maruti, Mahindra, Tata, Bajaj)
- We also own a structured distribution network for Aftermarket retrofit kits

4

CNG Refilling Station Product Portfolio

- Landi Renzo Group is, through the Newco Safe-CEC 51% owned, one of the most important global player in CNG / RNG Refilling Stations with a global customer base
- Safe is one of the most important suppliers in India for CNG / RNG Refilling Stations

Agenda

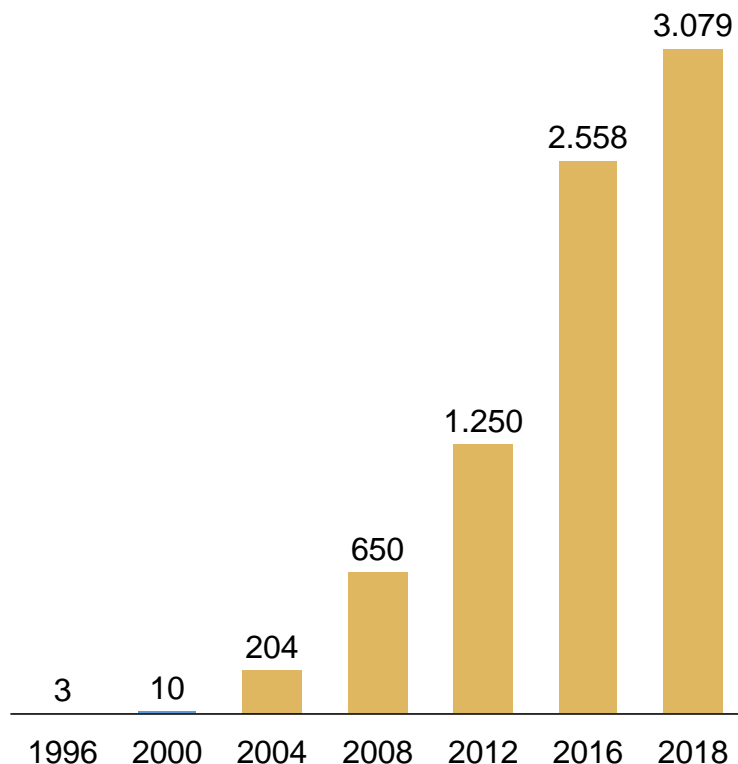
➤ Landi Renzo Group at a glance

➤ **Natural Gas Market in India – Our View**

➤ Landi Renzo Strategies in Natural Gas Vehicles – Global and Indian Market View

In the last 10 – 15 years, India has seen Natural Gas vehicle fleet growing even at a higher rate (18%) and anticipating the benefits of CNG

NG Vehicles Fleet in India
(‘000 units)



- **2012 – 2018 CAGR**
 - India 16,2%
 - World: 7%
- **India has the third largest NGV fleet worldwide (12,2%)**

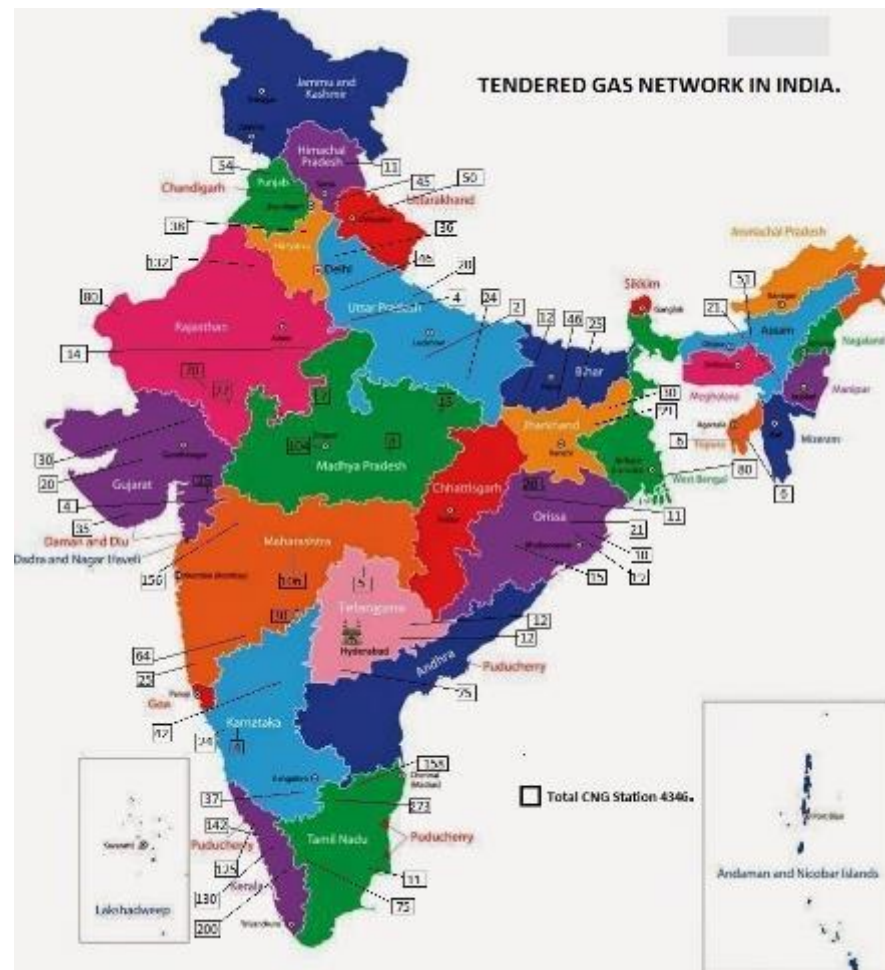
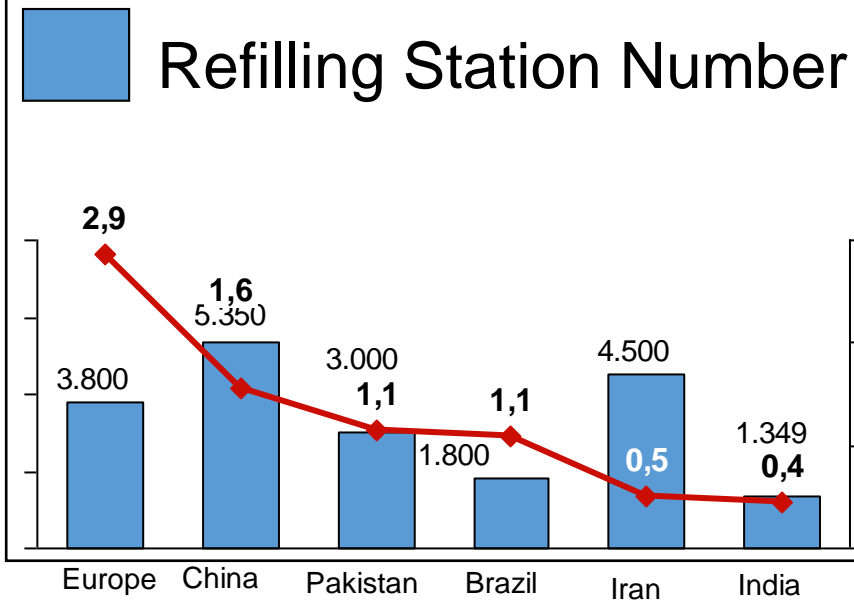


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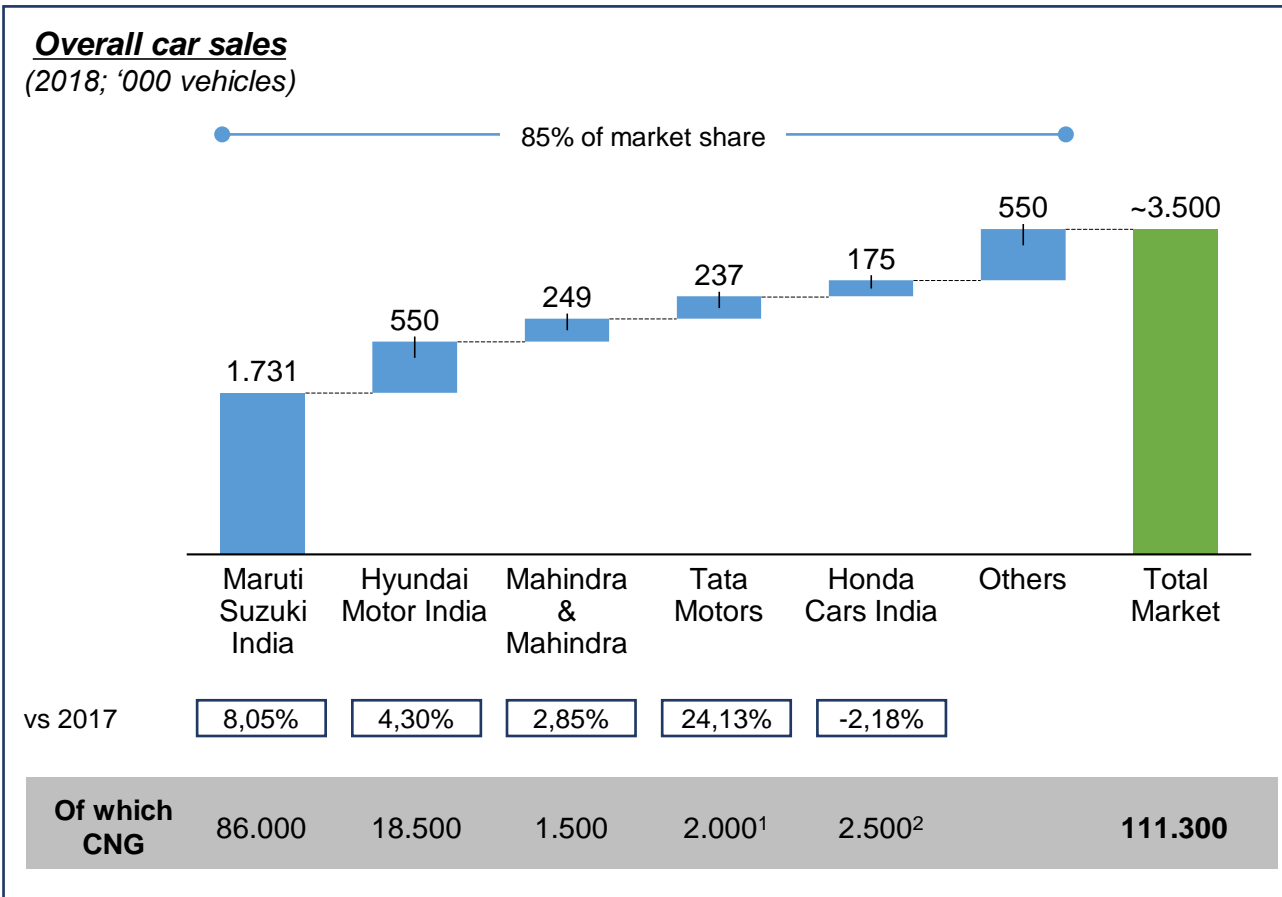
THE GAP IS GOING TO BE COVERED SOON !!

- Low number of refuelling stations (1.349) per NG vehicles

Refilling Station number per 1000 cars



Major OEMs are planning to invest in the CNG Passenger Cars segment



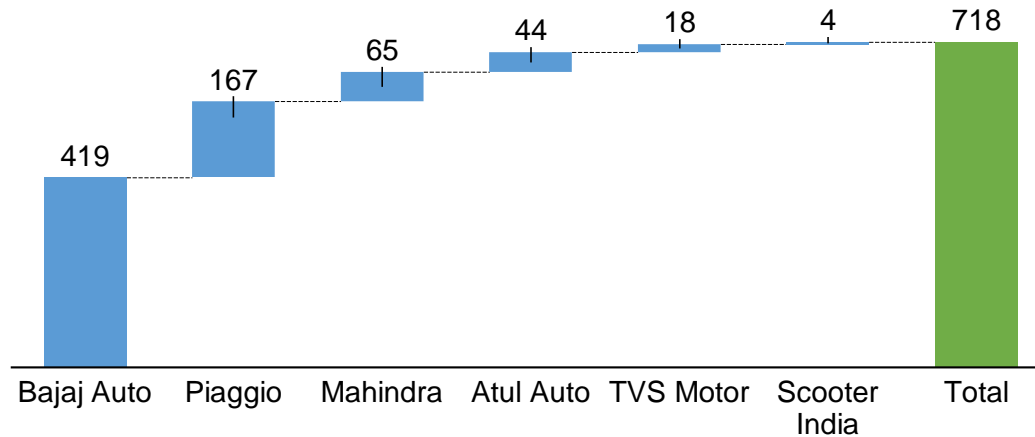
Highlights

- Overall market size ~**3,5 Million** PC / year
- First **five players** total **85%** of the market
- CNG market totals **111.300** vehicles in 2018, with an **increase of 50% over 2017**
- Maruti targets:
 - **200.000 CNG vehicles** by 2025
 - **Shut-down of diesel engine plant** by 2021-2022
- **Volkswagen Group** planning to **invest** consistently in CNG vehicles

Three-wheelers market segment is also showing promising growth rates

Overall Commercial Vehicles sales

(2018; '000 vehicles)



vs 2017

Bajaj Auto	41,0%	Piaggio	15,9%	Mahindra	29,8%	Atul Auto	20,6%	TVS Motor	3,2%	Scooter India	63,4%	Total	30,9%
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Of which CNG

Bajaj Auto	78.000	Piaggio	15.000	Mahindra	3.600	Atul Auto	7.200	TVS Motor	3.000	Scooter India	1.200	Total	108.000
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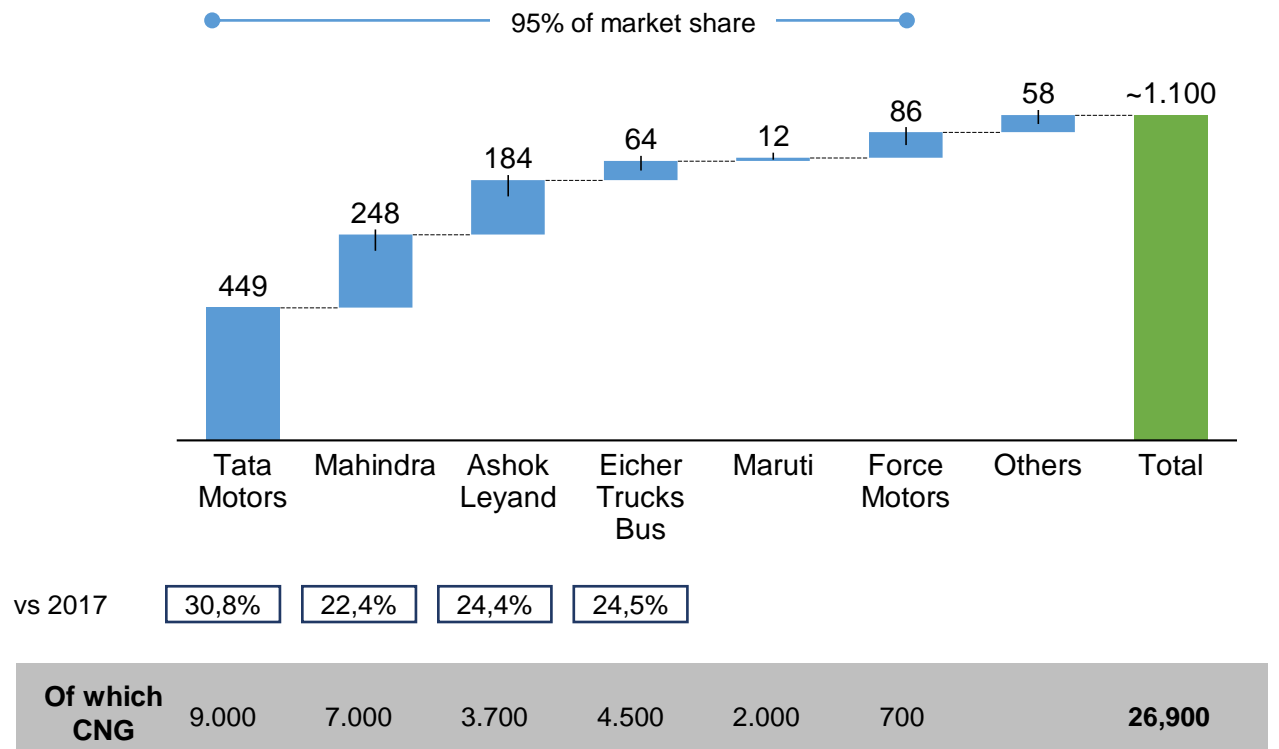
Highlights

- Overall market size ~**0,8 Million** 3W / year
- Overall growth of 5-6 % anticipated over next 4-5 years.
- Main players plan to **shift more than 50% of the entire 3W production to CNG** post BS VI norms -1st April 2020
- Remaining parts will consist of 5-10% of the electric and the remaining part of Gasoline and Diesel

Commercial Vehicles (Medium & Heavy Duty) market segment is also showing promising growth rates

Overall Commercial Vehicles sales

(2018; '000 vehicles)

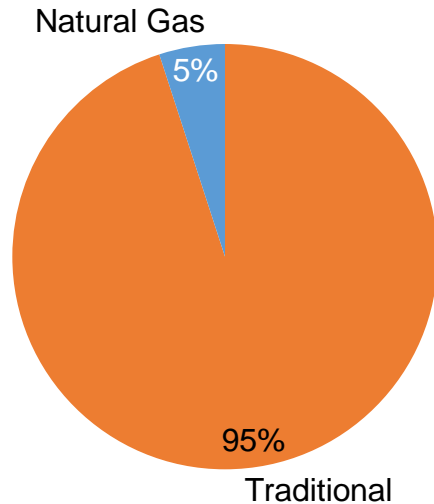


Highlights

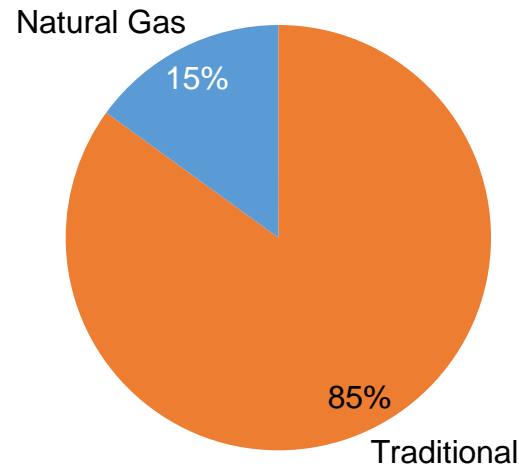
- Overall market size **~1,1 Million** commercial vehicles / year
- First **four players** total **95%** of the market
- Total sales expected to reach 1,6 million vehicles by 2023
- CNG sales expected to develop at a faster rate than overall market
- Export consisting in a large part of the market, up to 10-15% by 2023

Overall CNG Market Share for all vehicle types (passenger, commercial, 3W) is going to triple by 2023

CNG Market share 2018



CNG Market share 2023



Highlights

- Government's strategy is giving priority to a gas based economy
- The Indian's government objectives for the next decade are massive and mirror the rapid rise of natural gas for transportation
- Planned expansion of the refueling network from about 1,500 to 10,000 in 10 years, throughout the Country (82% of CNG stations are currently located in Delhi, Mumbai and Gujarat)
- Supported by a capillary infrastructure, NGVs could cover 50% of total vehicles sold in India by 2030
- LNG network is also expected to grow mid – long term, along with HD vehicles market

CNG advantages are expected to further support natural gas vehicles expansion in India in the next years leveraging three main drivers

Regulation Changes

Bharat Stage VI emission standards roll out in **April 2020** will drive the need of cleaner fuel solutions

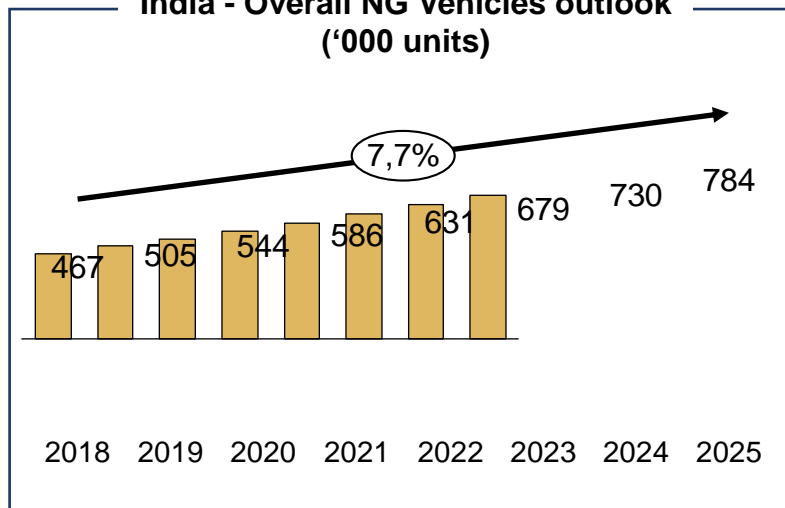
Vehicles running cost reduction opportunity

Natural Gas is almost **60% cheaper** than petrol and **40% cheaper** than diesel

CNG Refilling stations expansion

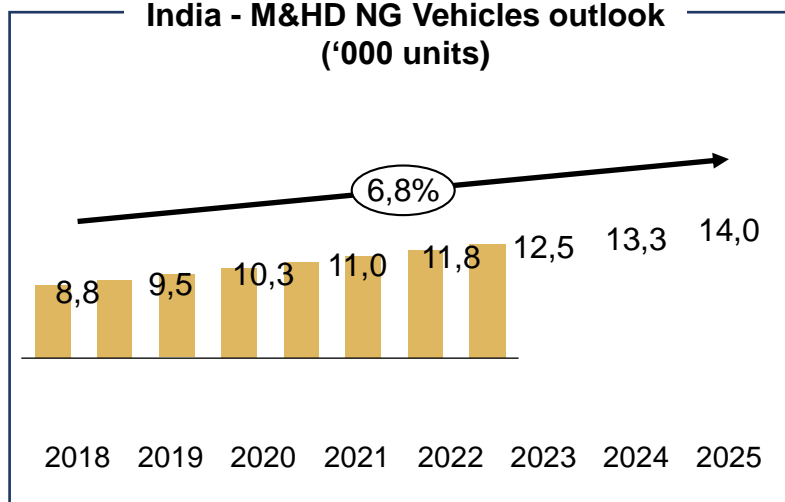
CNG refilling stations are expected to growth by 8% in next years, with new 5.000 stations

India - Overall NG Vehicles outlook ('000 units)



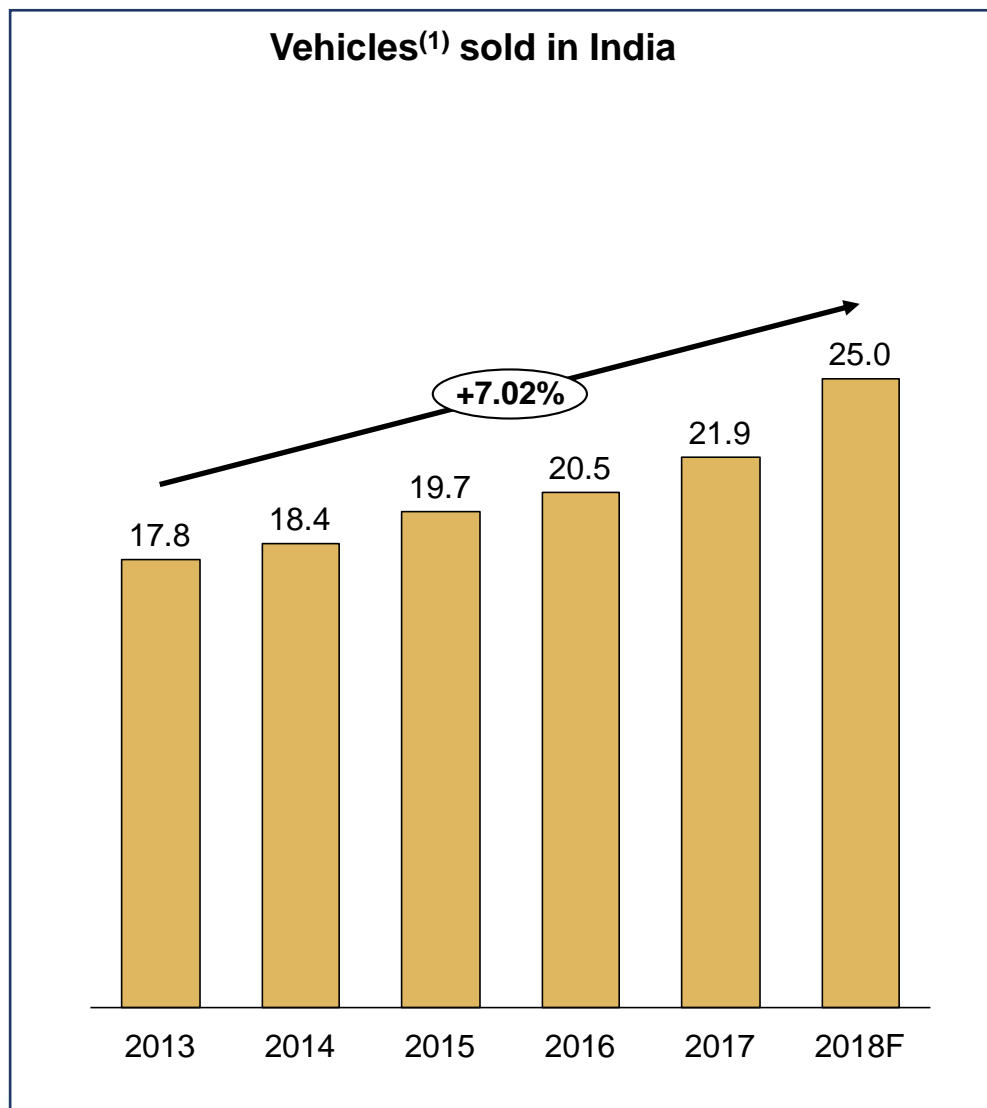
- Growth trends expected to be consistent over the next five years
- Maruti, Hyundai, Mahindra and Ford heavily involved to develop CNG vehicles for internal market and for the export

India - M&HD NG Vehicles outlook ('000 units)



- M&HD market is actually the fastest growing segment, but as it is still small it will have a smaller impact
 - totalling less than 3% of total engines
 - consisting mostly of buses
 - Concentrated in the 4l-6l range

The Indian car market is undergoing a period of strong growth, both for internal sales and in terms of exports



Market highlights

- Highest growth rate (9% in 2017) among top markets
- Market dominated by two-wheelers (81%) and passenger vehicles (13%)
- Passenger cars sales consisting mostly in small and mid-sized vehicles
- ~ 700K commercial vehicles sold in 2017
- According to the Automotive Mission Plan 2016-26, the Indian Automotive industry will grow 3,5-4 times in value

Emission Standard Changes

- Bharat Stage VI emission standards roll out in April 2020 will drive the need of cleaner fuel solutions

(1) including commercial vehicles, two and three wheels-vehicles
Source: SIAM (Society of Indian Automobile Manufacturers), the Economic Times

CNG advantages are expected to further support natural gas vehicles expansion in India in the next years leveraging three main drivers

Regulation Changes

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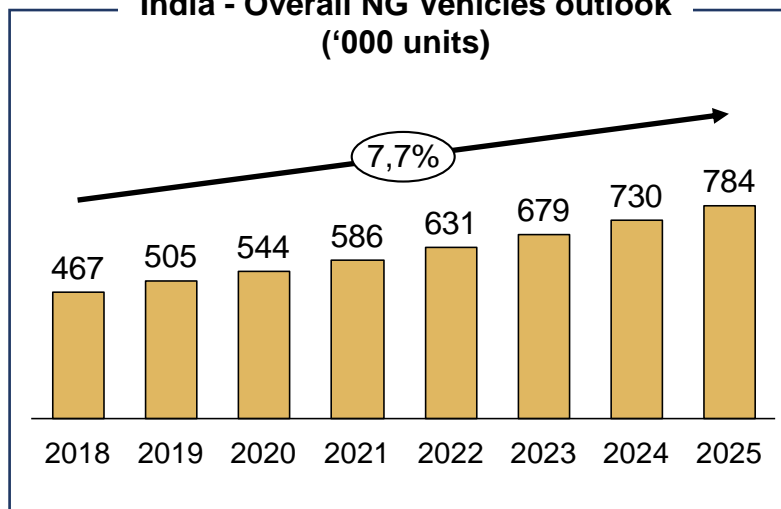
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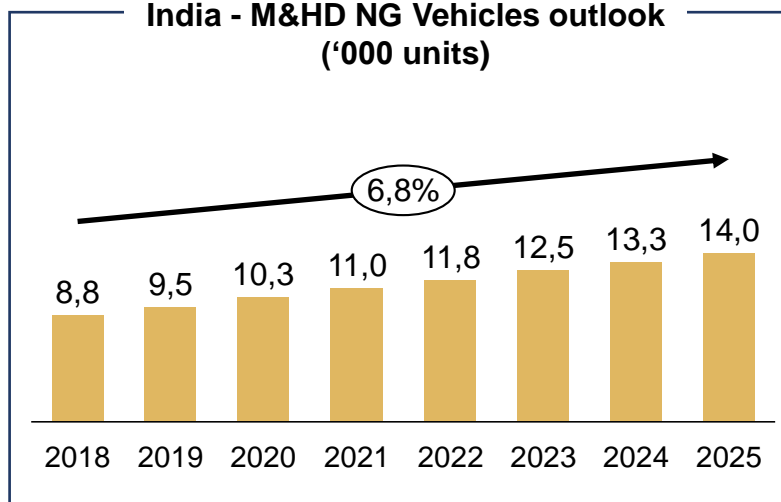
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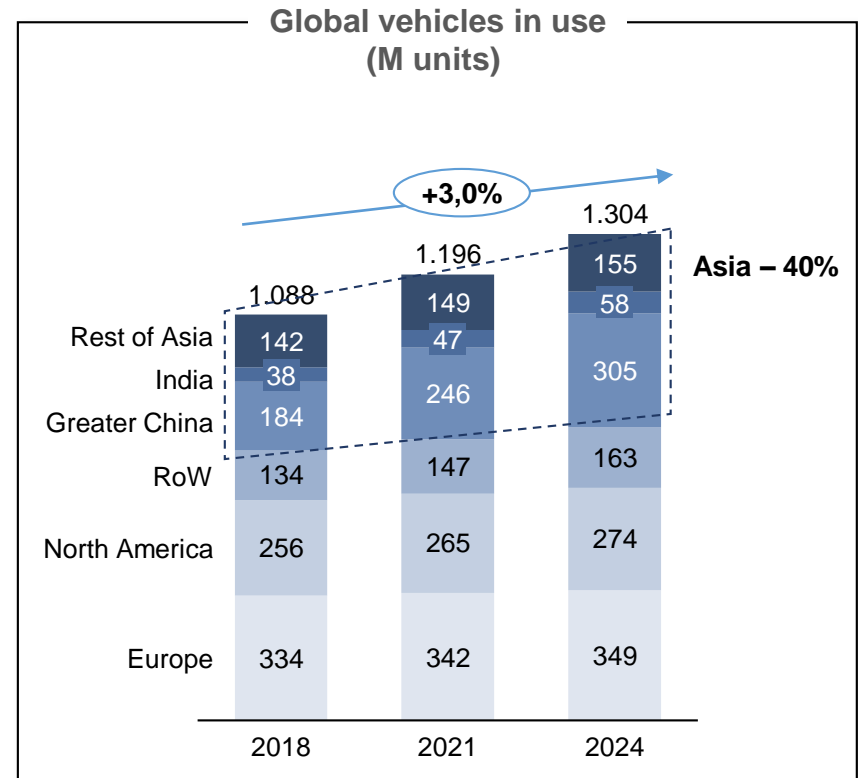
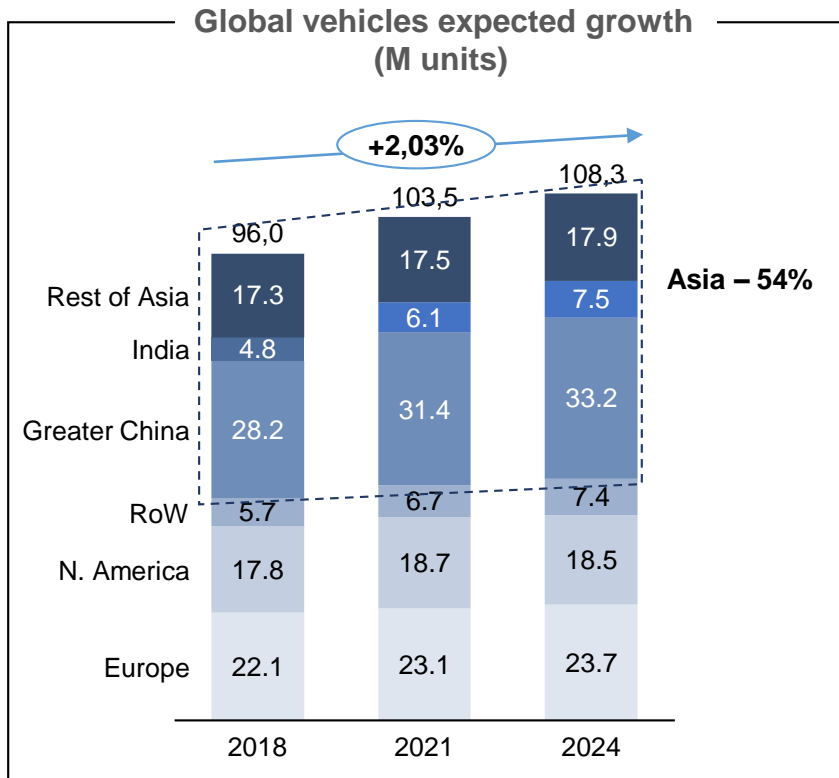
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➤ **Landi Renzo Strategies in Natural Gas Vehicles – a Global View**

World Passenger Vehicles sales are steadily growing, expected to reach 108M by 2024, with more than 1,3bn circulating cars in 2024 with diesel declining



- Many European OEMs are seeing **gas-mobility a reliable “bridge”** towards EVs but also are funding a consistent part of their **next year sales on alternative fuels** (mainly LPG but also CNG). Until now **LPG has played a leading role** in gas-mobility for passenger cars and it is foreseen it will continue in the next 5 years
- In other parts of the world, like **India, Russia, Rest of Asia, LatAm & Mexico**, passenger car gas-mobility is considered even more as one of the main fuel for future mobility, also supported by incentives and investment on the infrastructure
- Vehicles in use keep constantly growing, offering a **large market potential for After Market sales**

The automotive industry is facing a transformational time with different challenges and opportunities for suppliers



Environmental protection awareness

- Tighter Emission limits requires **expensive systems**, even for OEMs
- **Declining sales of diesel** vehicles forcing OEMs to find quick, efficient and cost-competitive solutions



New technologies are transforming the automotive sector

- Regulations are pushing technology towards alternative powertrain configurations (BEV, Hybrid, CNG-LNG, Hydrogen/fuel cell), requiring dedicated **infrastructure developments**
- Buying decision will be affected by **different factors** based on **geographical area** (US, Europe, China and RoW), **consumer segments** (mass, premium) and **habits, with a specific attention to TCO**



Transformation of the automotive value chain

- Upcoming Automotive Industry “disruption” will fundamentally **change the Industry** requiring the need to rethink overall strategy
- **OEMs** will need to sustain historical higher level of investment in R&D, with **Suppliers success factors** will be the **capacity to innovate** and add value to OEMs, while implementing a lower operating cost base

Gas, in its different forms, brings consistent advantage over conventional fossil fuels

LPG

PROPANE & BUTANE

- It is a mixture of propane and butane in different %
- **Cost-efficient solution** compared to gasoline, easy-to-install equipment in vehicles
- **CO₂ emissions reduced** up to 12-15% compared to petrol, reduction of PM del 90%
- Broadly **available refueling infrastructure** in selected markets (mainly Eu, Russia & CIS, North Africa and Turkey)

CNG

COMPRESSED NATURAL GAS

- Composed exclusively by **methane**, which can be directly extracted from the large reserves around the globe
- **CO₂ emissions reduced** up to more than 20% compared to petrol and gasoline, strong **reduction up to 99% of PM and NOx**
- **Widespread refueling infrastructure** rapidly increasing in countries such as Eu, India, Russia, and Mexico

LNG

LIQUEFIED NATURAL GAS

- It is the **obtained through CNG liquefaction**, stored at -160° C
- It allows **efficient transportation** and to make Gas available in regions not reached by pipelines
- Much more **convenient in terms of energy density**, it is the preferred choice for **long-range transportation** (HD, but also ships or trains)

RNG

RENEWABLE NATURAL GAS

- Composed by **methane produced by renewable sources**, such as biomasses
- Can be **consumed at the production site** (eg.: for transportation or energy production) **reinject**ed in the grid or **liquefied** into LNG
- It represents the best choice to create a circular economy with virtually no carbon footprint impact

H₂

HYDROGEN

- Hydrogen gas does not contain any carbon and it is therefore the **most efficient fuel for decarbonization**
- It can be produced using renewable energy, and used as a fuel for transportation and energy production
- Stored in compressed form, it is a very efficient mean of conservation – and transport – of energy
- Considered the fuel of the future and a less impacting alternative to battery electric vehicles

Infact, CNG is globally recognized as one of the alternative fuels able to bring numerous substantial advantages compared to traditional fuels ...



Advantages for the car owner, and ...

- CNG is **much less than the price** of gasoline or diesel in terms of direct cost
- CNG **extends the life of the engine** and requires lower maintenance costs (less oil and spark plug changes)
- CNG **does not contaminate or dilute** the engines crank case lubricating oil
- **Pipes and mufflers last** longer because CNG does not react with the metal

... Advantages for the environment

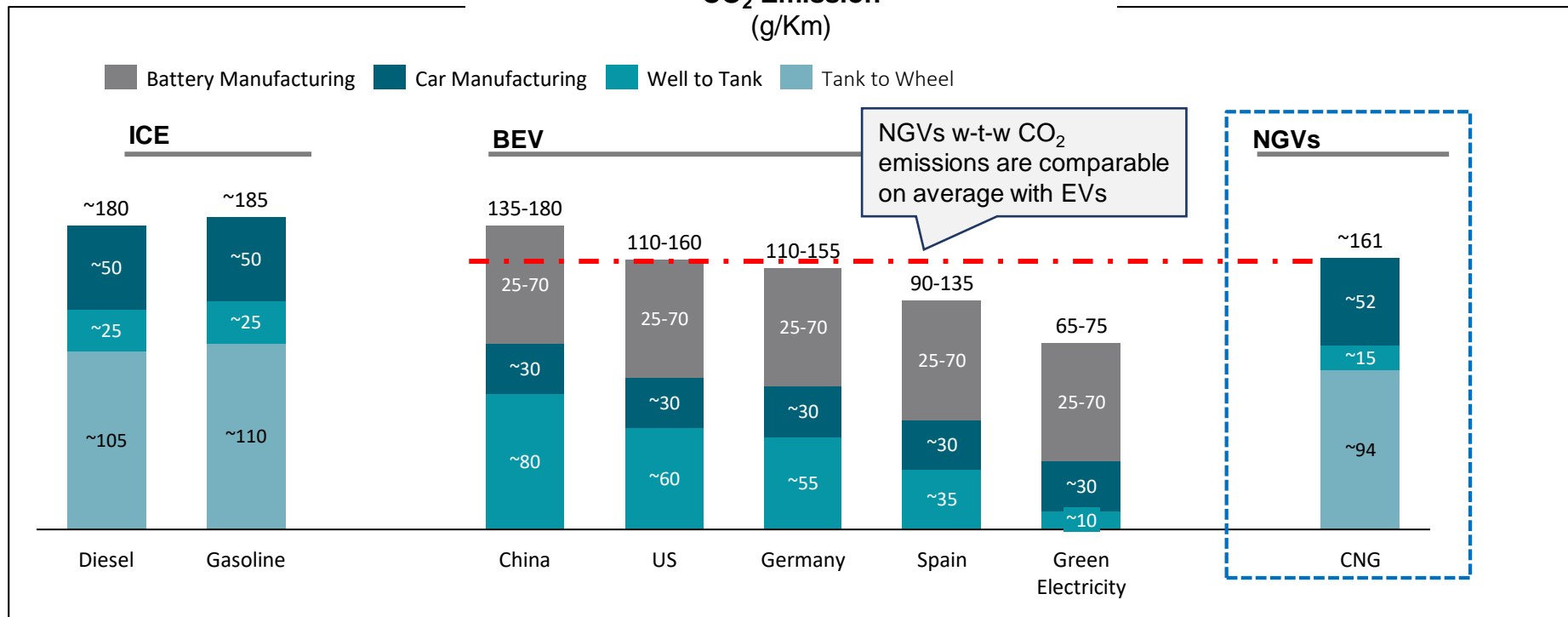
- **CNG is a much cleaner fuel** than gasoline or diesel which can significantly improve environmental conditions by reducing the air pollution
- **Vehicles running on CNG produce less CO, CO₂, NO_x** and other emissions
- Vehicles fueled by CNG produce **30 to 40% less green house gas emissions**⁽¹⁾

Gas-mobility will play a key role in this changing scenario, representing a real & “ready-to-use” in all vehicles segments

Gas-Mobility as a “ready-to-use” solution	Main Evidences	<ul style="list-style-type: none"> • Gas-mobility (CNG / LNG / LPG / RNG) represents for Passenger Cars and Heavy Duty segments a the key technological solution for the very next future of automotive evolution, with long-term perspectives, along with other alternative fuel technologies (Hybrids, BEVs, FCEVs, ...). • Gas-mobility represents for OEMs a ready-to-use solution, with no specific need of high level of R&D investments • Gas-mobility helps (i) OEMs, to immediate average emission reduction (ii) users, thanks the most favourable TCO, compared to existing technologies
	Critical Success Factors	<ol style="list-style-type: none"> 1. End User Acceptance - Passenger Cars and Heavy Duty End Users are valuing the TCO (efficiency) the first criteria for choosing G-Mobility 2. OEMs Offering - Nowadays OEMs are offering a large set of models both in Passenger Cars and Heavy Duty segments: every day we assist to new gas-powered heavy duty powertrains and cars launches 3. Oil Price - Oil price plays an important role for maximizing End Users purchasing propensity towards Alternative Fuel vehicles: current forecast projects oil price stable 4. Gas Distribution Infrastructure - availability / evolution is the fundamental element enabling G-Mobility affirmation both in Passenger Cars and Heavy Duty segments CNG / LNG networks present important evolution plan in most of worldwide regions

... with not always known / recognized CO₂ emission reduction along all vehicle lifecycle (well-to-wheel) compared to ICEs and not so far BEVs

Whole (Well-to-Wheel) Passenger Car Lifecycle
CO₂ Emission
(g/Km)



- NGV-CNG vehicles produce 3-5% CO₂ emission less than LPG vehicles in whole vehicle lifecycle
- NGVs allow 10% – 18% CO₂ emission reduction in Tank-to-Wheel cycle and about 40% in Well-to-Tank phase vs. ICEs
- NGVs produce 15-30% CO₂ emission more than BEVs in whole vehicle lifecycle
- NGVs show full compliance with 2021 ETS rules (95g/Km)

Assumption: compact car (C-segment) as reference vehicle (4.1 l/100 km diesel; 4.8 l/100 km gasoline; 35.6 kWh battery), 120,000 km lifetime average grid emissions in China, Germany, Spain in 2017; EV manufacturing (excl. fuel cell and battery) 40% less energy-intensive than ICE manufacturing; Natural Gas CO₂ emission reduction vs. gasoline engine: CNG: 18%
ICE: Internal Combustion Engine; BEV: Battery Electric Vehicle; NGV: Natural Gas Vehicle (Port Fuel Injection - PFI)
SOURCE: Expert interviews, AlixPartners analysis

Landi Renzo Group is looking ahead to affirm its own global “G-Mobility Way” complement BEVs technology for transportation decarbonization



Operational
excellence

Gas solutions as an affordable bridge to electrification and the only real solution for Heavy Duty

Forward looking: extend our leadership in the gas-mobility by enlarging our offering

- Develop **multi-disciplinary skills** to navigate the “*new era of automotive*” alongside **Electric Vehicles**
- Enlarge **technology capabilities to all alternative fuels developments**, with strong **focus on Hydrogen**
- Exploit the opportunity to become a **center of excellence** to investigate **new Alternative Fuels technologies**, such as **LNG-battery series solutions** and **off-road applications**

A person is driving a car, with their hand on the steering wheel. The car is on a road that stretches into the distance. The sun is setting on the right side of the road, creating a warm, golden glow. The sky is a mix of orange and blue. The overall mood is peaceful and forward-looking.

The Clean Air Company

Driving The Future

SAFE – Clean Energy Compression merger



On November 27th 2017 Landi Renzo announced the **merger of SAFE with Clean Energy Compression** (now named IMW Industries), owned by Clean Energy Fuels Corp., specialized in CNG fuelling systems, including compressors, dispensers, and storage systems for transport vehicles.

The NewCo setting up from the merger is the **second player worldwide** in terms of turnover, and has operational headquarters in San Giovanni in Persiceto (Bologna / Italy).

The new player will keep its **focus on the compressor sectors for CNG and Renewable Natural Gas (RNG)**, aiming to achieve a leading position worldwide.

San Giovanni in Persiceto will host **the Group Centre of Excellence** for the development of new products.