



**STRATAS**  
ADVISORS  
A HART ENERGY COMPANY



## Increased Conversion to Natural Gas Vehicles in Asia

Global Alternative Fuels

Webinar | March 17, 2016

UPSTREAM | MIDSTREAM | DOWNSTREAM | FUEL & TRANSPORT



# Agenda

Overview

---

Background

---

Regional Snapshot of Natural Gas Use in Asian Transportation Sector

---

NGVs Developments in Selected Countries in Asia

---

Summary

---

Q&A



# Overview

---

# Overview

Switching to natural gas to reduce traditional air pollution

- Consumption of natural gas grew at 6% annually in 2004-2014, driven by China
- China and Japan are the biggest consumers of natural gas in Asia
- The transportation sector accounted for 4% of total natural gas consumption in Asia in 2014
- Compressed natural gas is the most commonly used gaseous fuel in light-duty vehicles
- Liquefied natural gas has started being used in medium- and heavy-duty vehicles, especially for long haul range vehicles
- Asia is home to five countries in the top ten countries in the world having natural gas vehicles fleets
- The trend to convert gasoline/diesel vehicles to run on natural gas is increasing in China and India, plateauing in Thailand and decreasing in Bangladesh and Pakistan



## Background

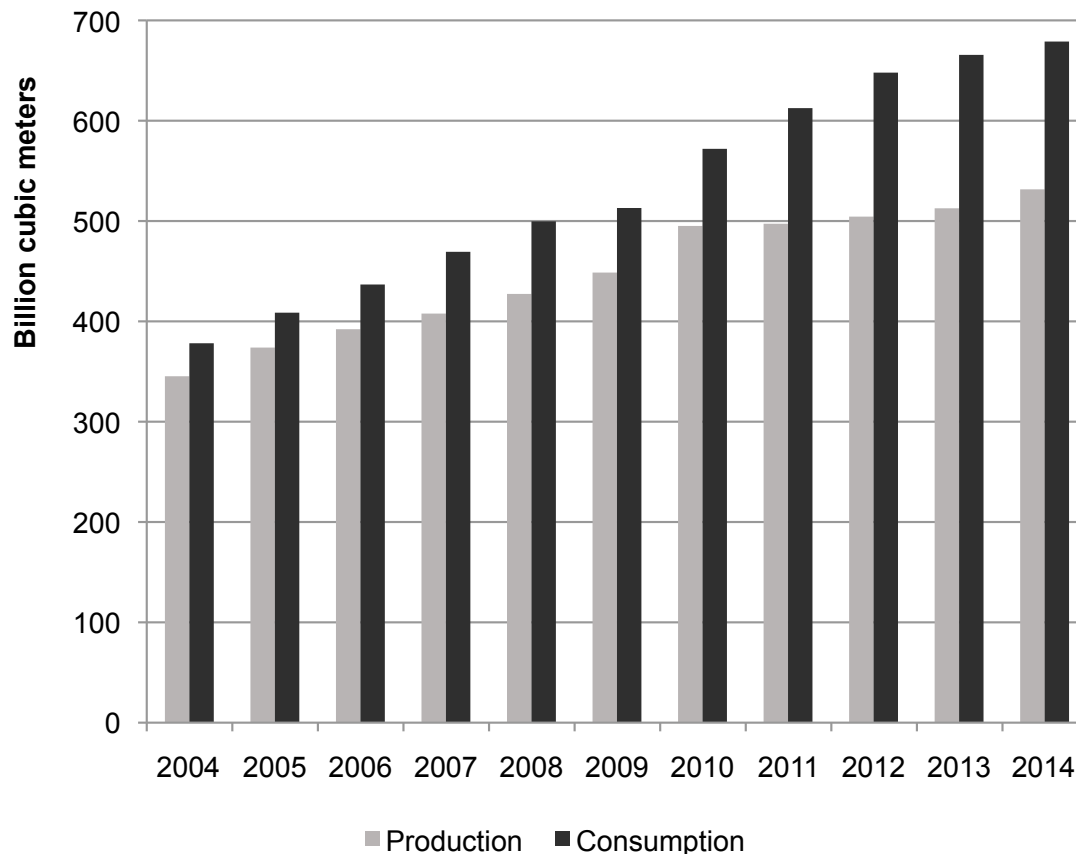
---

Increased usage of natural gas in Asia

# Production and Consumption

More natural gas consumed in Asia

## Production and Consumption of Natural Gas in Asia



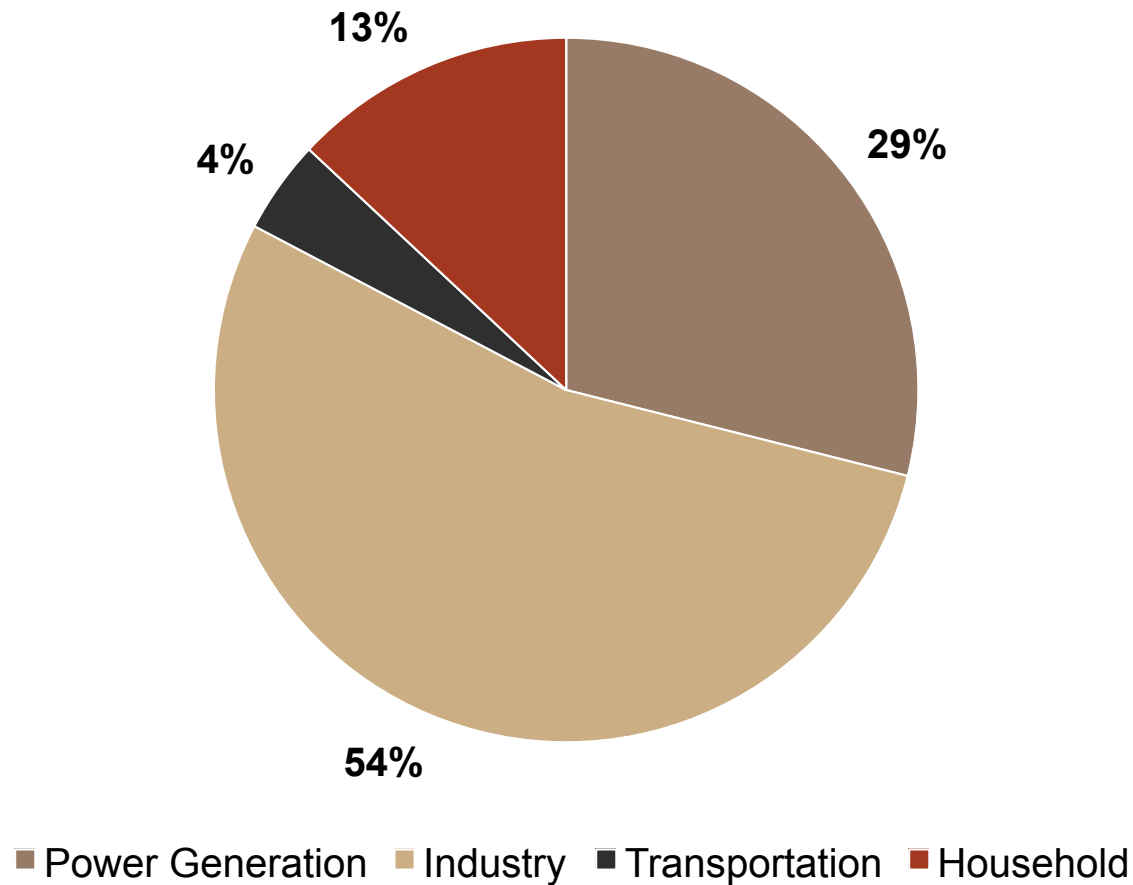
- Japan and China accounted for 44% of Asia's consumption in 2014
- Consumption increased by 6% annually in 2004-2014
- Production increased by 4% annually
- Imports increased by 16% annually

Source: BP Statistical Review 2015, February 2016

# Consumption by Sector

The transportation sector accounted for only 4% of total natural gas consumption

## Consumption by Sector in 2014



Source: Stratas Advisors, February 2016



# Natural Gas in the Asian Transportation Sector

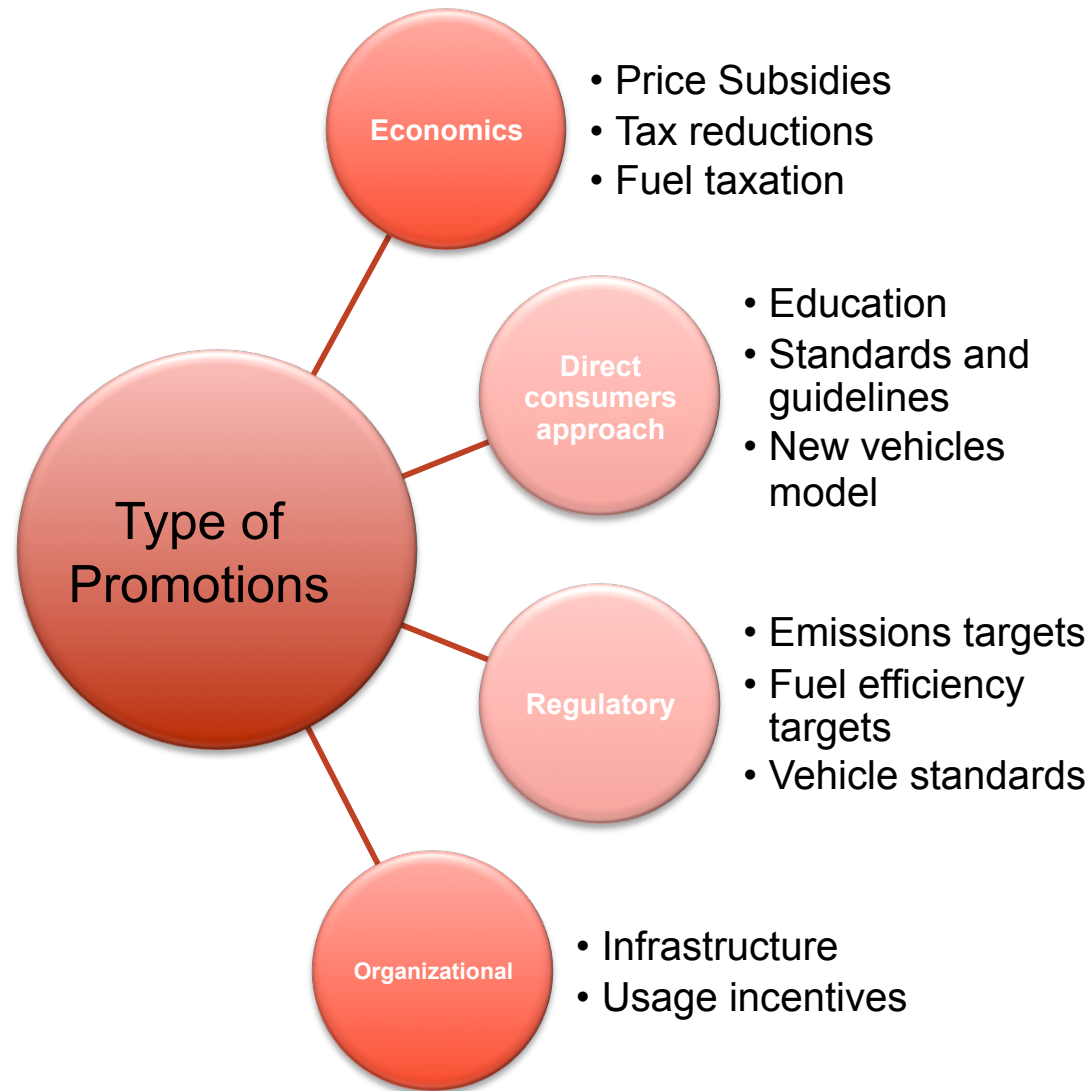
---

Promoted to reduce air pollution in major cities



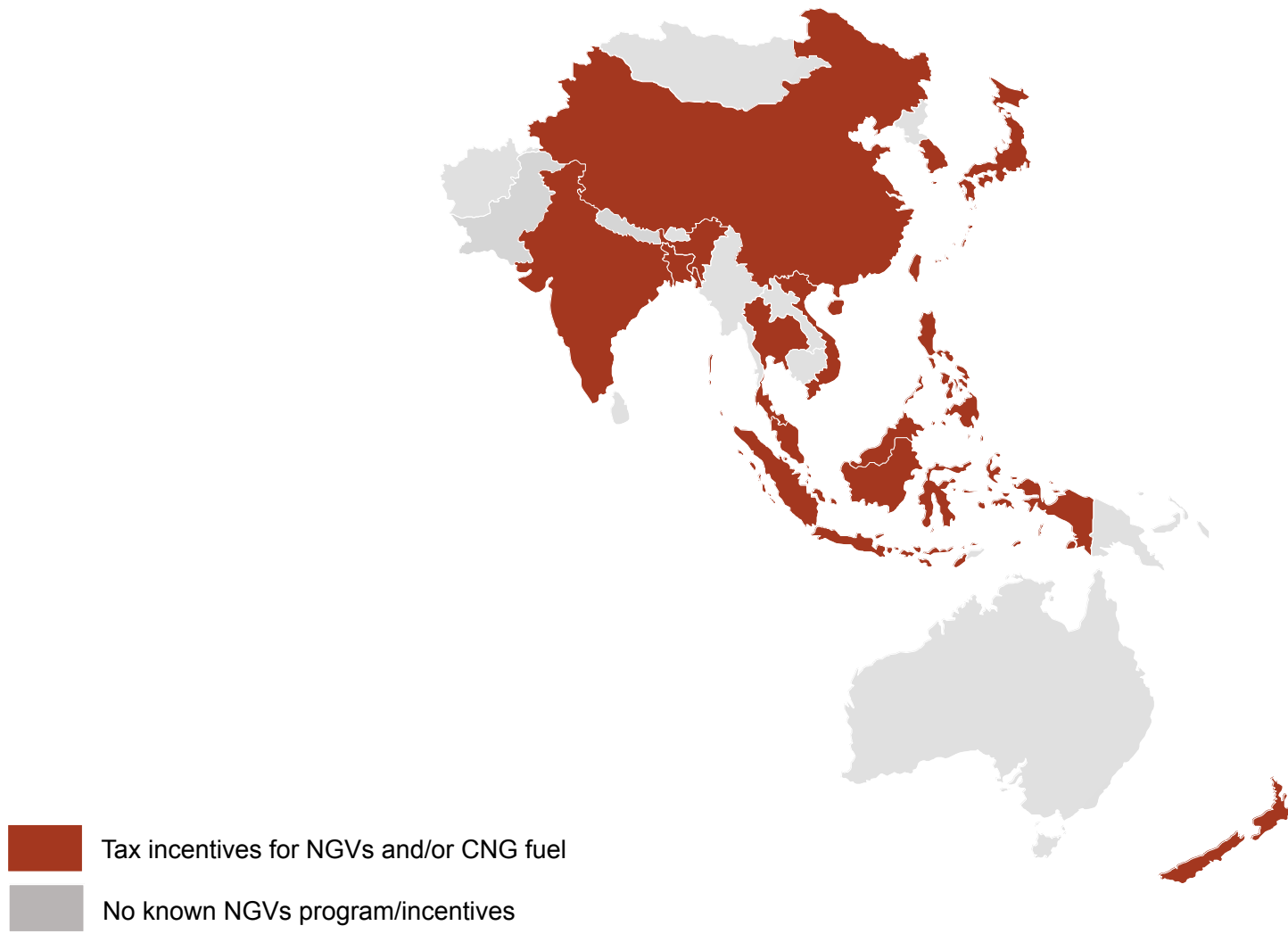
# Shifting to Natural Gas Vehicles

Many ways to promote natural gas vehicles



# Fiscal Policies for Natural Gas Vehicles

Many countries offer tax reductions or tax exemptions

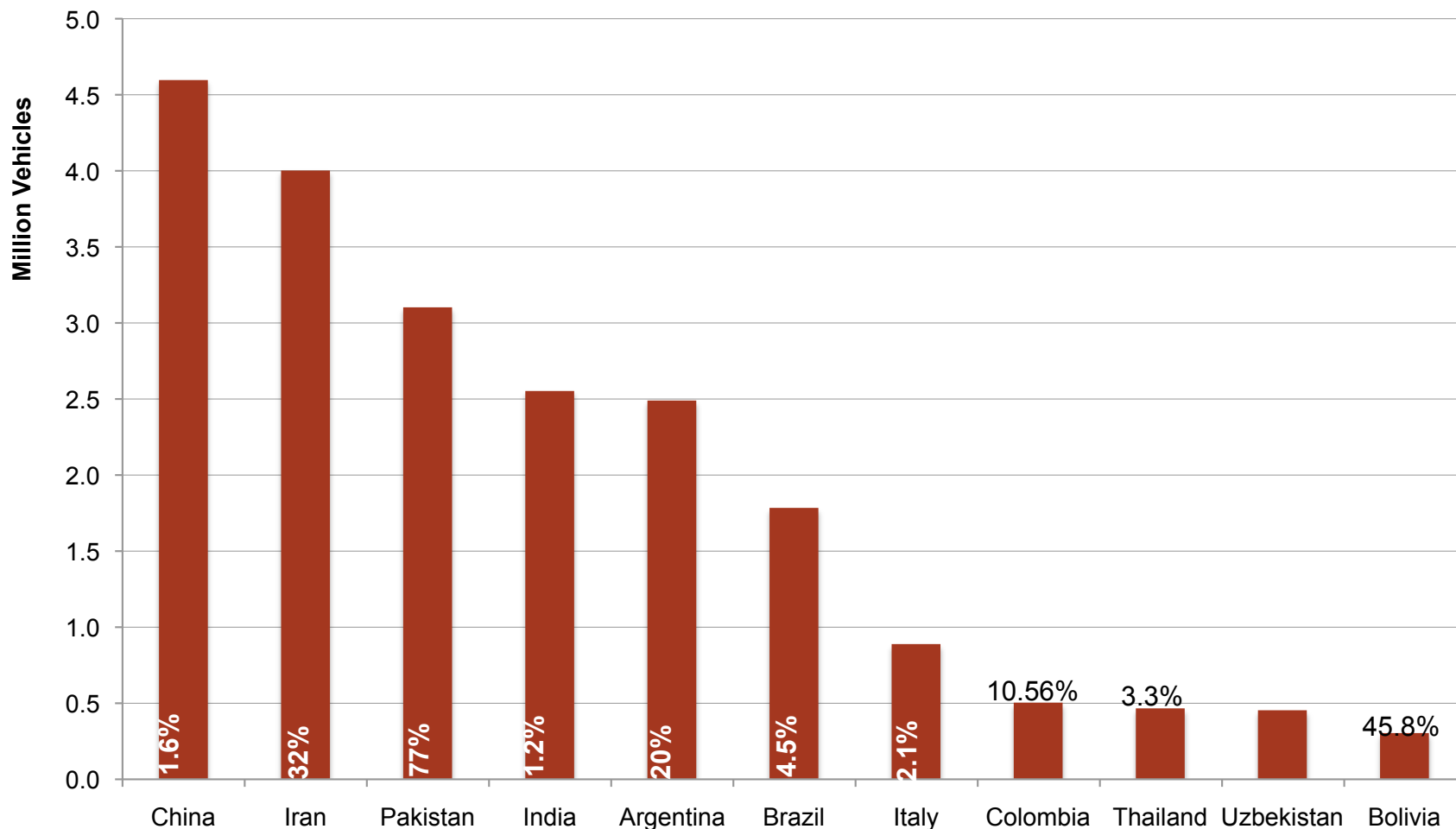


Source: *Stratas Advisors, February 2016*

# Global Country Ranking of NGVs

China and Iran are neck to neck with about 4 million NGVs on the road at the end of 2015

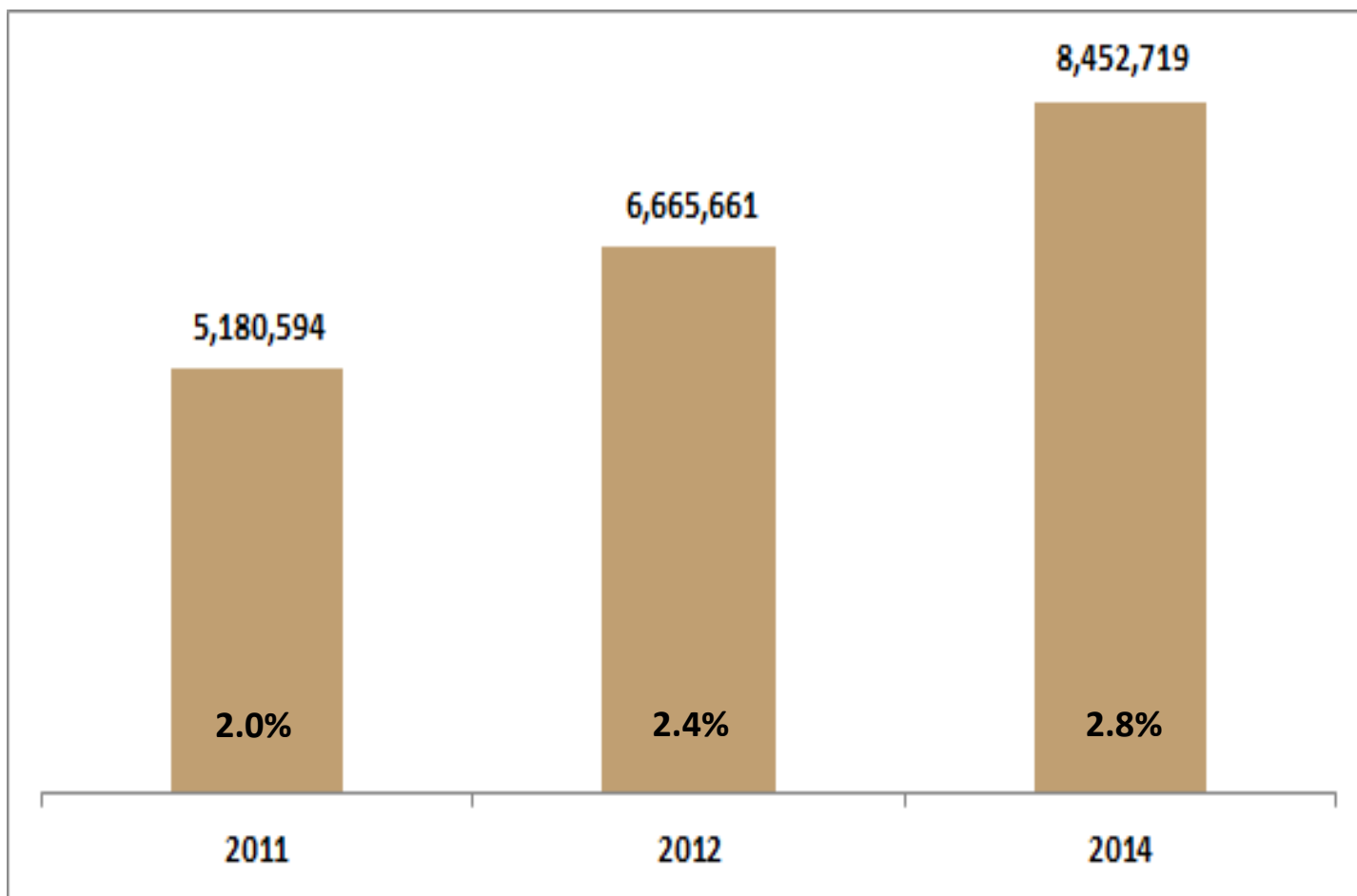
## Top Ten Countries with Largest NGVs Population



Source: Stratas Advisors, February 2016

# NGVs in Asia

Very small share of the total vehicle population



Source: Stratas Advisors, February 2016



## Development of NGVs in Selected Countries

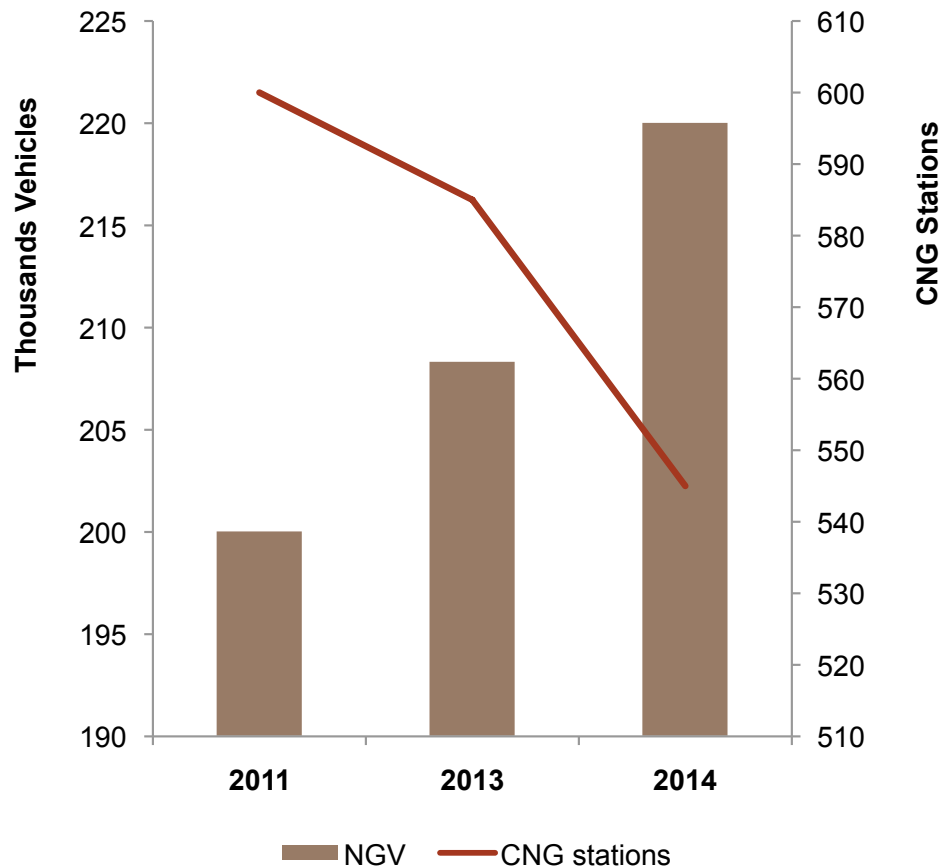
---

Policies have been set but infrastructure cost is a major hindrance

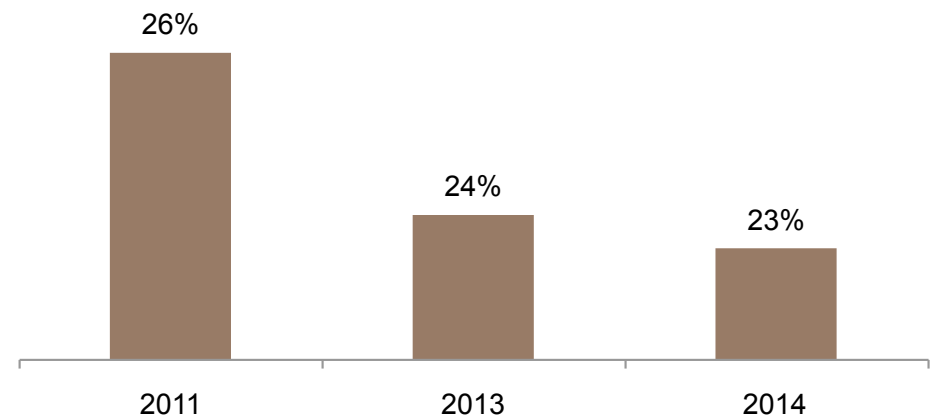
# Bangladesh

NGVs accounted for 23% of total light-, medium- and heavy-duty vehicles

## NGVs & CNG Refueling Stations



## Penetration of NGVs in Total Vehicles



### Challenges

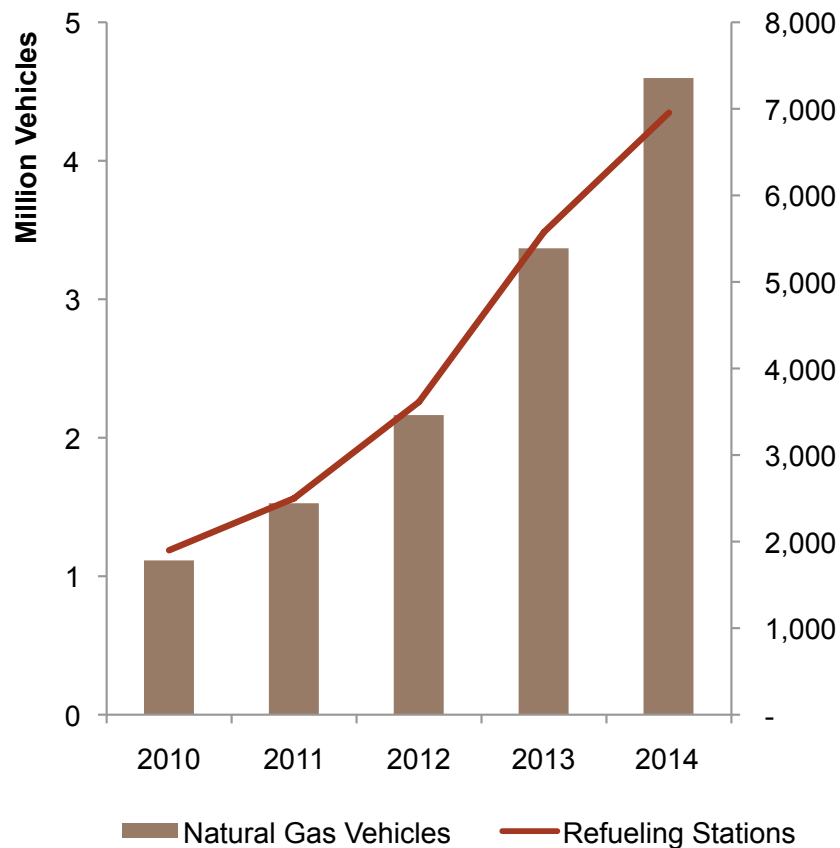
- Lack of natural gas supply, but Bangladesh not willing to import
- Proposal to stop NGVs promotion measures
- Aim to reduce dependency on natural gas (i.e. increase renewable energy usage)

Source: Stratas Advisors, February 2016

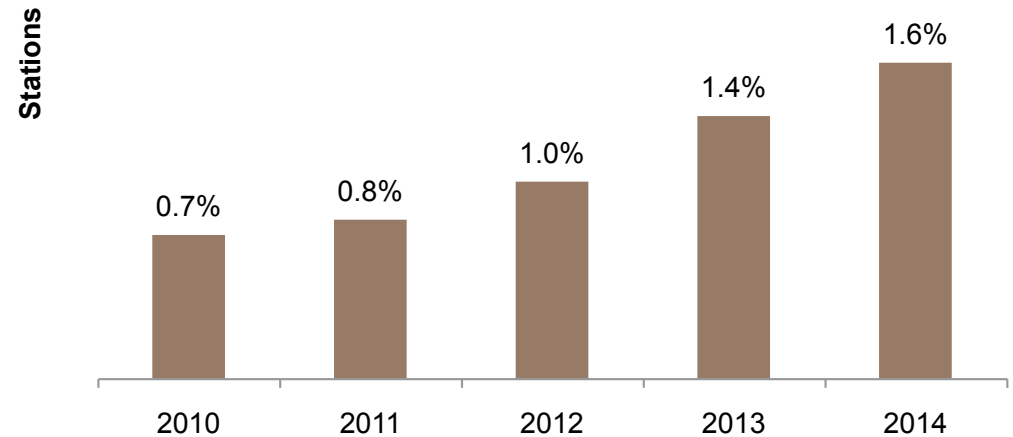
# China

At 1.6% China has a small share of NGVs in total vehicles

## NGVs and CNG Refueling Stations



## Penetration of NGVs in Total Vehicles



### The Way Forward

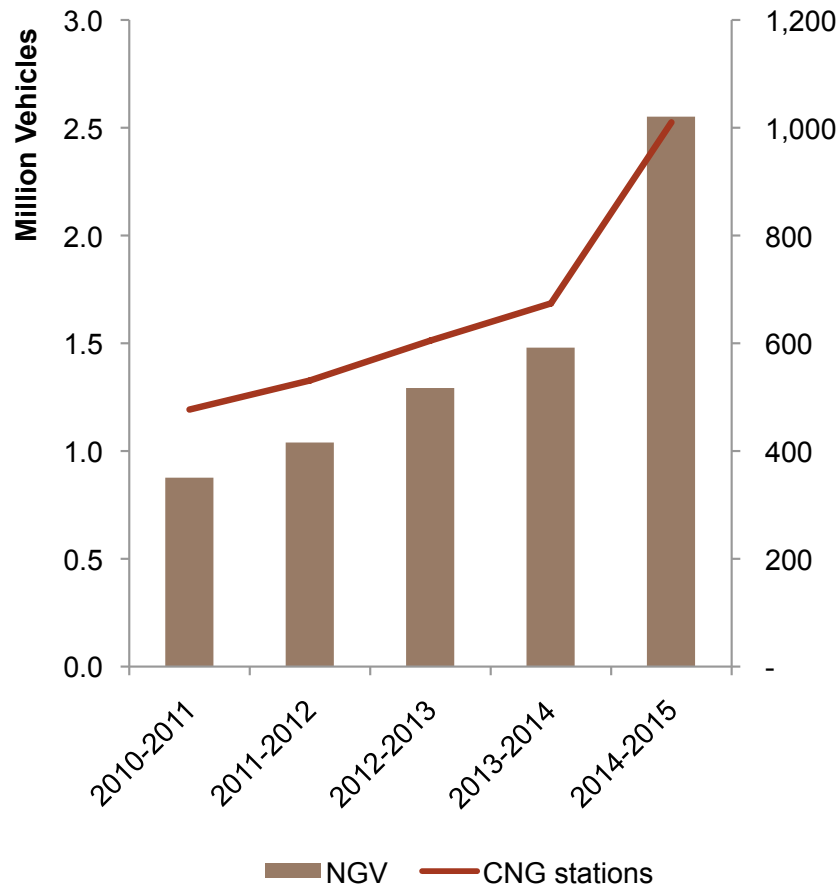
- More focus on utilizing LNG in heavy-duty vehicles rather than in CNG market
- More provinces set targets to build CNG and LNG refueling infrastructure up to 2020

Source: Stratas Advisors, February 2016

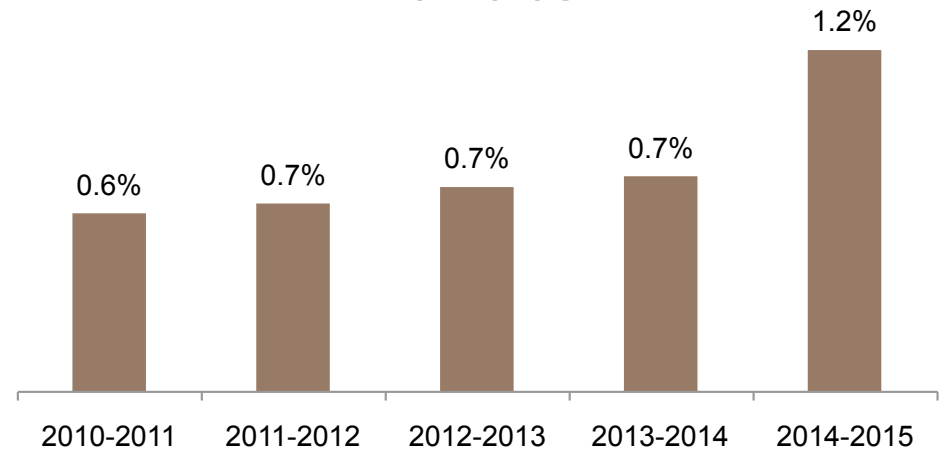
# India

More states turn to CNG to reduce air pollution

## NGVs & CNG Refueling Stations



## Penetration of NGVs in Total Vehicles



## The Way Forward

- The National Green Tribunal mandates diesel phase-out, to be replaced with CNG mainly for public transportation sector.
- Non-fiscal incentives for light-duty and passenger vehicles run on CNG including exemption of odd-even day in Delhi

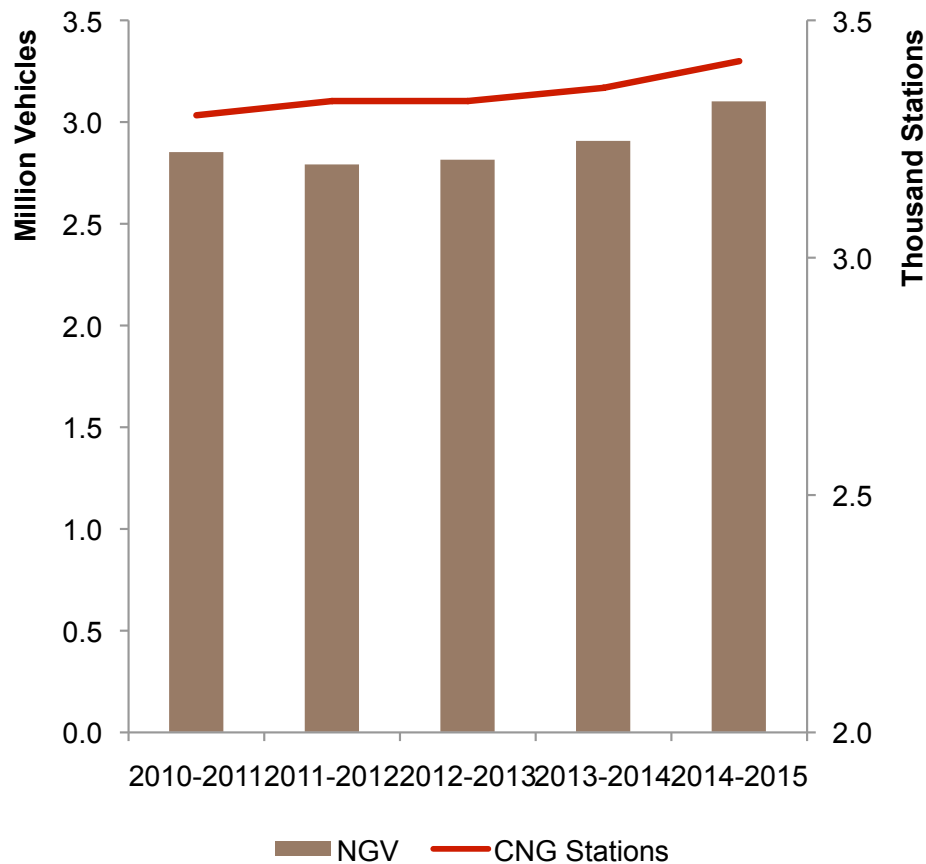
Source: Stratas Advisors, February 2016



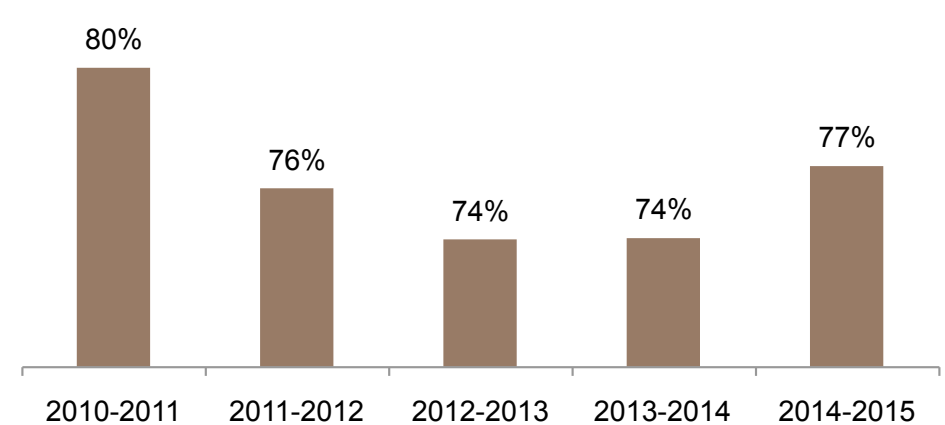
# Pakistan

Lack of natural gas supply has resulted in closure of CNG refueling stations

## NGVs & CNG Refueling Stations



## Penetration of NGVs in Total Vehicles



## Challenges & The Way Forward

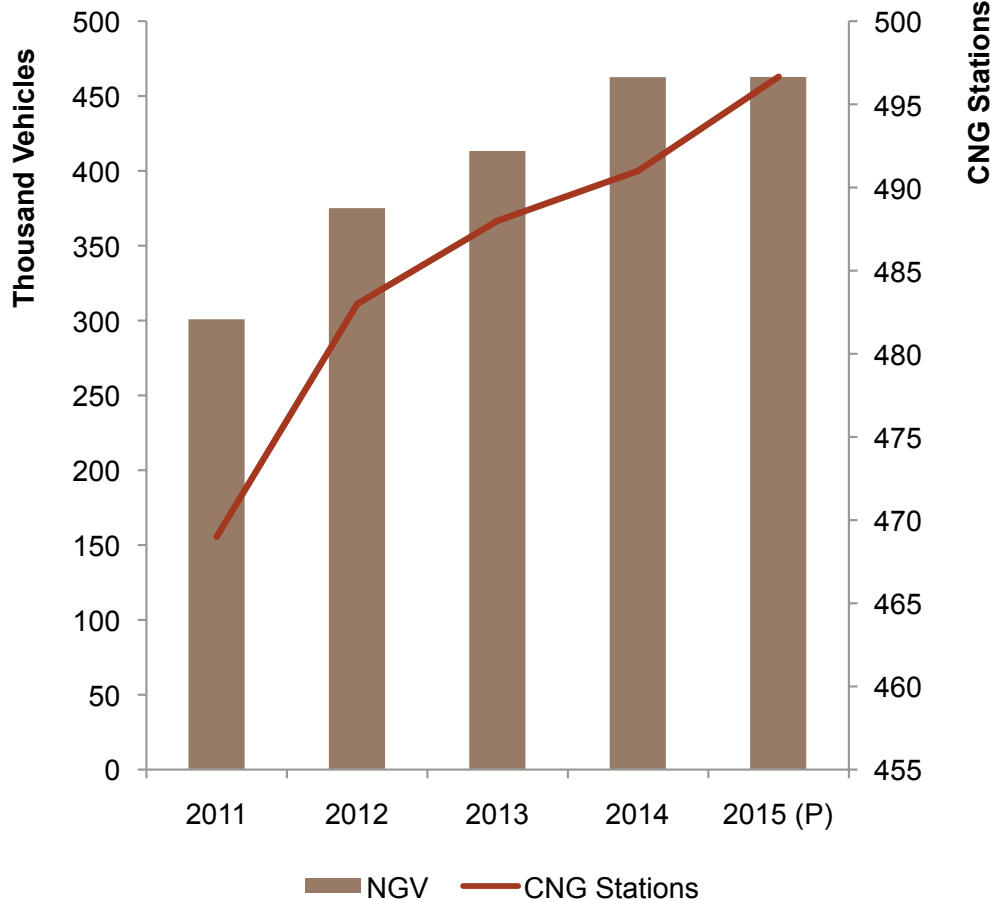
- Lack of natural gas supply results in closure of CNG refueling stations and shift back to gasoline-powered vehicles
- Agreement with Qatar to import LNG to increase supply for industry and CNG (transportation sector).

Source: Stratas Advisors, February 2016

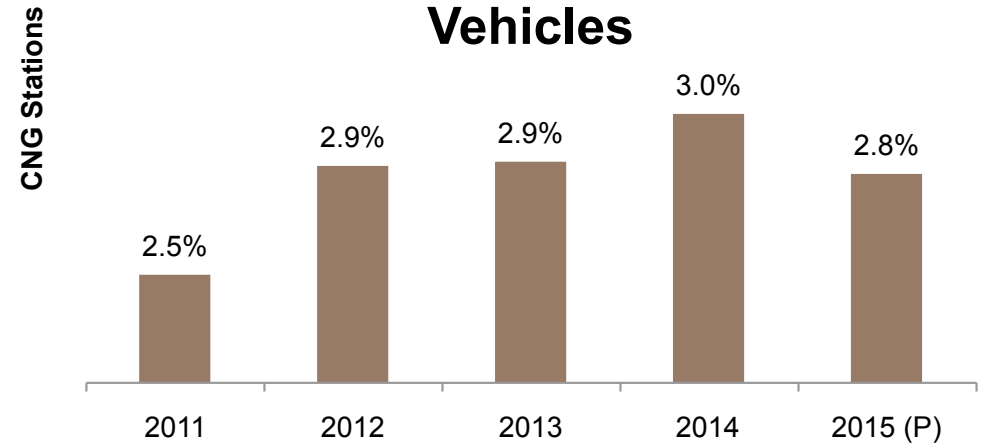
# Thailand

PTT ended its monopoly in CNG refueling stations, open up the market to private players

## NGVs & CNG Refueling Stations



## Penetration of NGVs in Total Vehicles



## Challenges & The Way Forward

- CNG price was regulated by the government – PTT experienced losses
- PTT limits its CNG refueling stations to a max of 500 – the market is now open for private players
- The government started de-regulating CNG prices

Source: Stratas Advisors, February 2016



# Summary

---

# Summary

Infrastructure is the major hindrance

- Development of natural gas vehicles is facing hindrances:
  - High capital investments to build charging infrastructure
  - Higher retail price of CNG vehicles compared to gasoline/diesel vehicles of the same class
- Gasoline and diesel will still be used but alternative transportation fuels are also developed to secure energy supply, reduce gasoline/diesel usage, reduce CO<sub>2</sub> emissions and improve air quality.
- Increase usage of LNG to reduce pollution from the heavy-duty vehicles running on long haul routes.
- Governments promote the use of natural gas vehicles by:
  - Preferential tax schemes
  - Mandate to be implemented by the State Road Transport Corporations
  - Incentives for establishing charging infrastructure
  - Incentives for buyers to buy NGVs
  - Incentives in the form of easy access into the cities i.e. Delhi's government exempted NGVs from even/odd vehicles days.



# Q & A

## Contact Information

Lucky Nurafiatin | Manager

[Lnurafiatin@stratasadvisors.com](mailto:Lnurafiatin@stratasadvisors.com) | +65.6353.6127

# STRATAS ADVISORS

A HART ENERGY COMPANY

Stratas Advisors, a Hart Energy company, is a global consulting and advisory firm that covers the full spectrum of the energy sector and related industries. We can help you develop a deeper understanding of the developments that are shaping the future of oil & gas. Our support includes customized consulting that is focused on a client's specific strategic objectives, competitive challenges and asset base. Additionally, we offer support through subscription services and comprehensive market studies.

---

UPSTREAM | MIDSTREAM | DOWNSTREAM | FUEL & TRANSPORT

1616 South Voss Road Suite 675 | Houston, TX 77057 United States | TEL +1.713.260.6426 | [stratasadvisors.com](http://stratasadvisors.com)

Bogotá | Brussels | Denver | Houston | London | Melbourne | Mexico City  
New Delhi | New York | San Diego | São Paulo | Singapore | Washington, D.C.