

Natural gas: Fuelling the Future

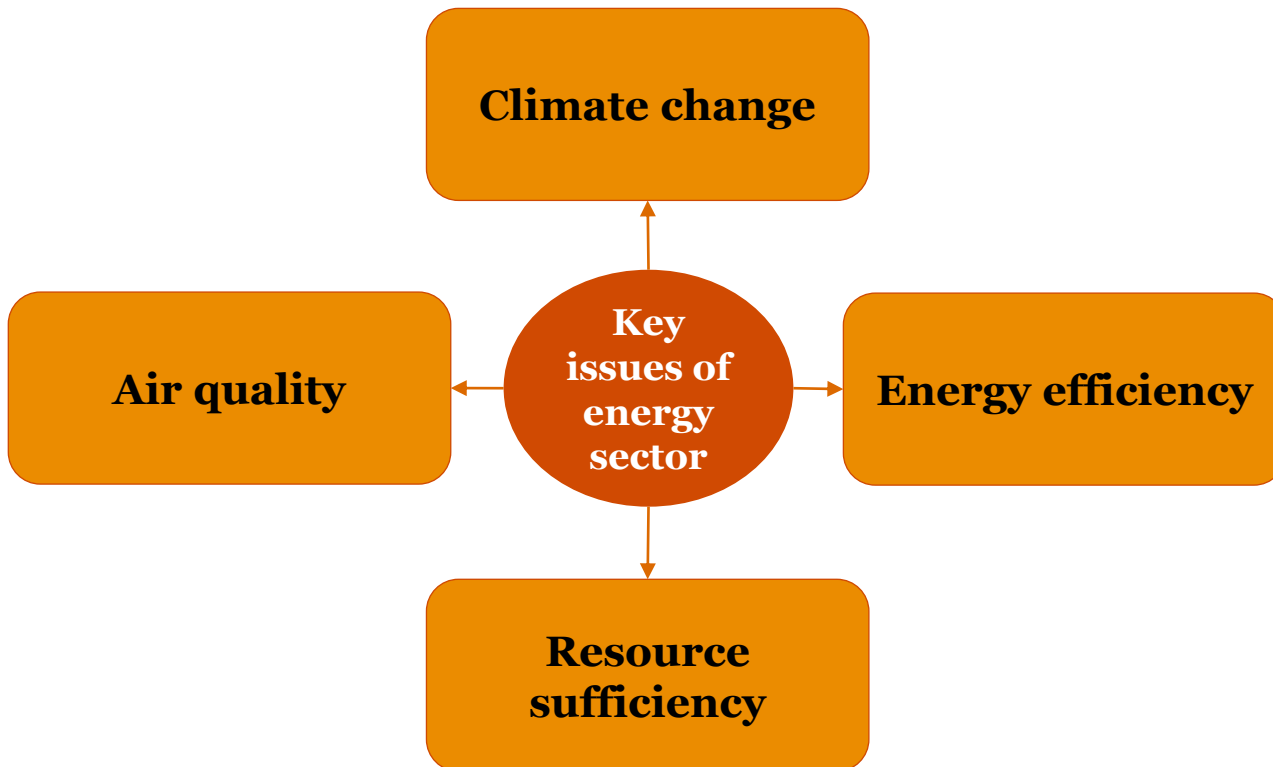
India

15 February 2020

Strictly private and confidential



Why natural gas?



Natural gas as a bridge fuel

1. Cleaner burning properties
 - Reduced emissions of CO₂, SO_x, NO_x, PM etc.
2. Reduced GHG emissions
 - 50% less CO₂ emissions compared to others
 - However, methane leakage must be checked
3. Versatile fuel
 - Used as fuel or feedstock in industries
 - Used for cooking, drying, heating
 - Used as transportation fuel in liquid/ gaseous form
 - Fast switch-on with gas in dual-fuel power plants
 - Can be used in Compressed, liquefied or absorbed forms
4. Reliable partner to renewables
 - Can switch in to complement other fuels
5. Cheap and globally available
 - ~943 BCM total global trade in 2018
 - 45.7% trade as LNG which is trading at ~\$3 / MMBtu

India's current gas market overview

7th

Largest gas consumer amongst developing nations and 14th overall

-2%

Drop in Natural gas production during FY15 to FY19

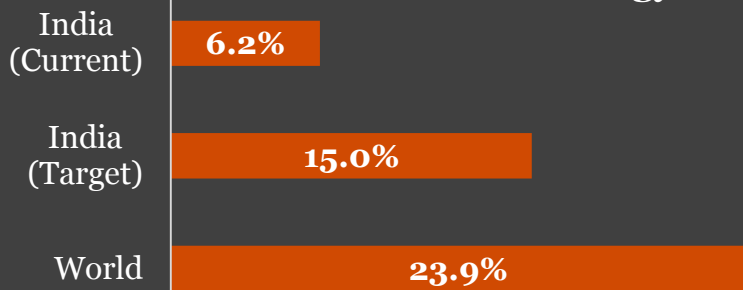
4th

Largest LNG importer in the world

18.5%

Increase in Natural gas consumption during FY15 to FY19

Natural Gas in energy mix



National gas grid and gas hub is planned to deepen the market

Major players: GAIL, PLL, GSPL, ONGC, RIL, IOCL, HPCL, BPCL

Challenges

- Import dependency 47%
- Pipeline connectivity
- Dynamic regulations
- Price sensitivity of demand

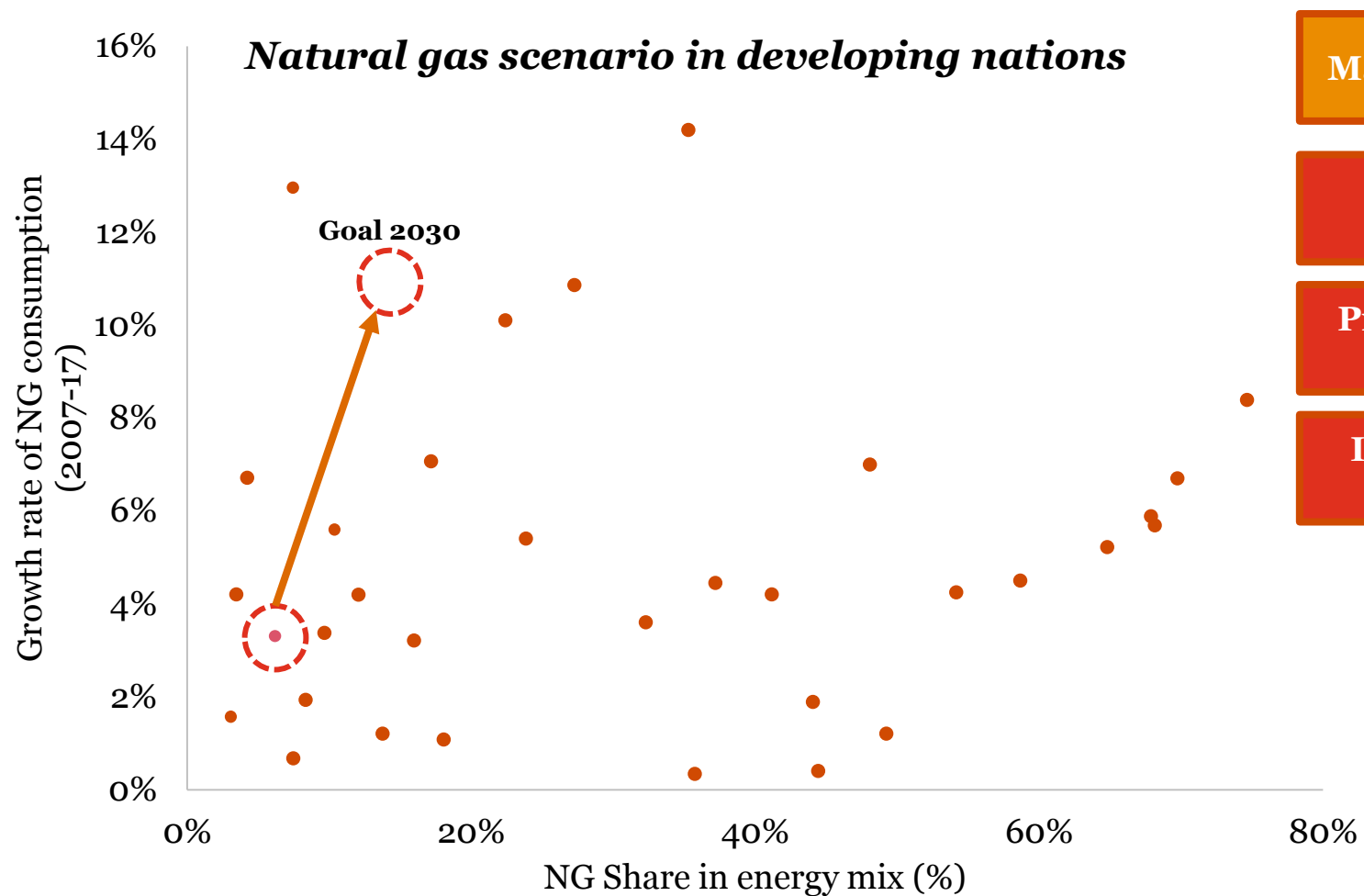
Investment planned

- ~USD 60 Billion investment planned in gas infrastructure
- ~USD 12.5 Billion in CGD alone
- ~34 MMTPA regasification capacity in construction or planning stage

Recent budget announcements

- Pipeline infrastructure to be augmented from 16,300 Kms to 27,000 Kms
- Transparent pricing mechanism for gas

The ambition of a gas-based economy...



Major challenges

Stagnant domestic production

Price sensitivity of demand

Infrastructure bottlenecks

Opportunities

Upstream reforms introduced encourages E&P

LNG prices at an all time low

New infrastructure being created

Regulatory reforms are being introduced in gas market

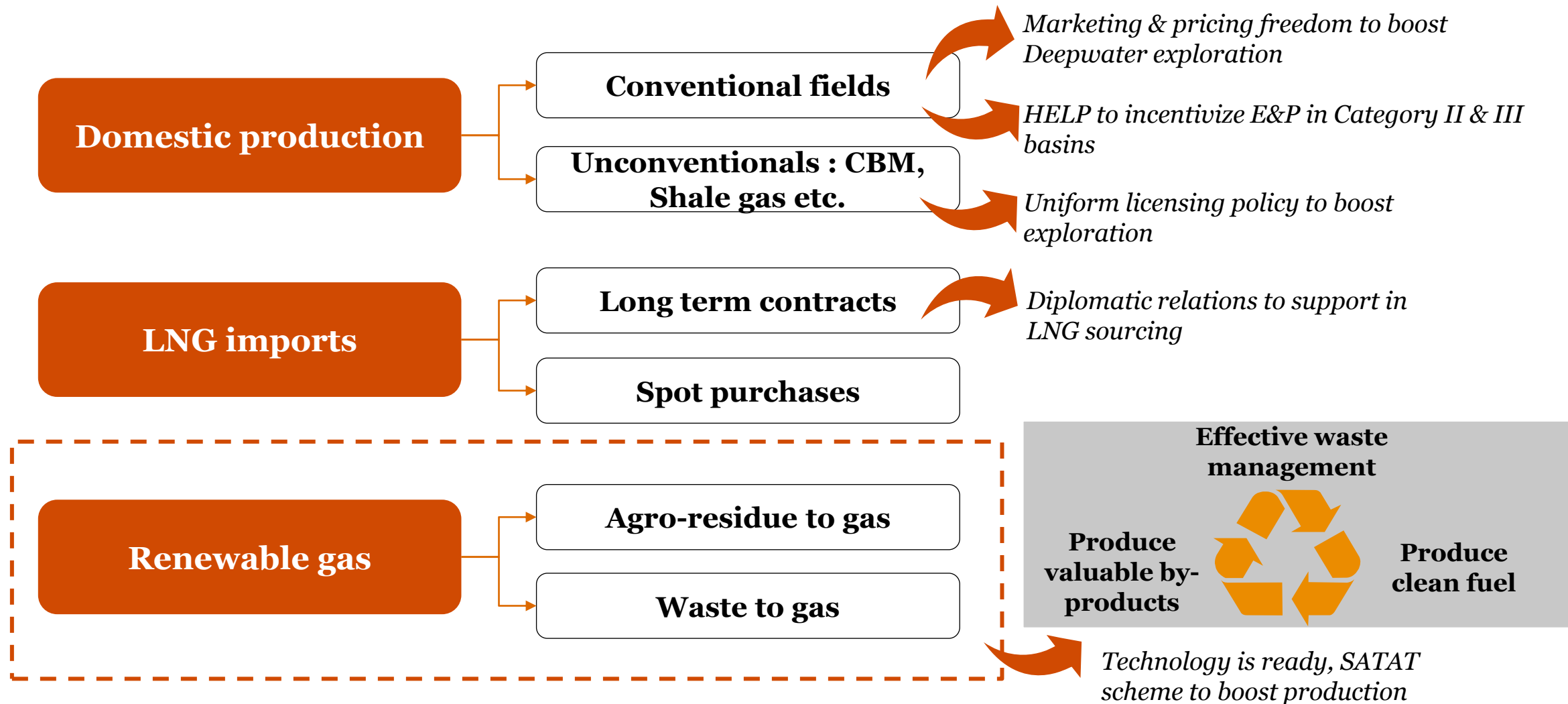
Gas hub, National gas grid to boost consumption



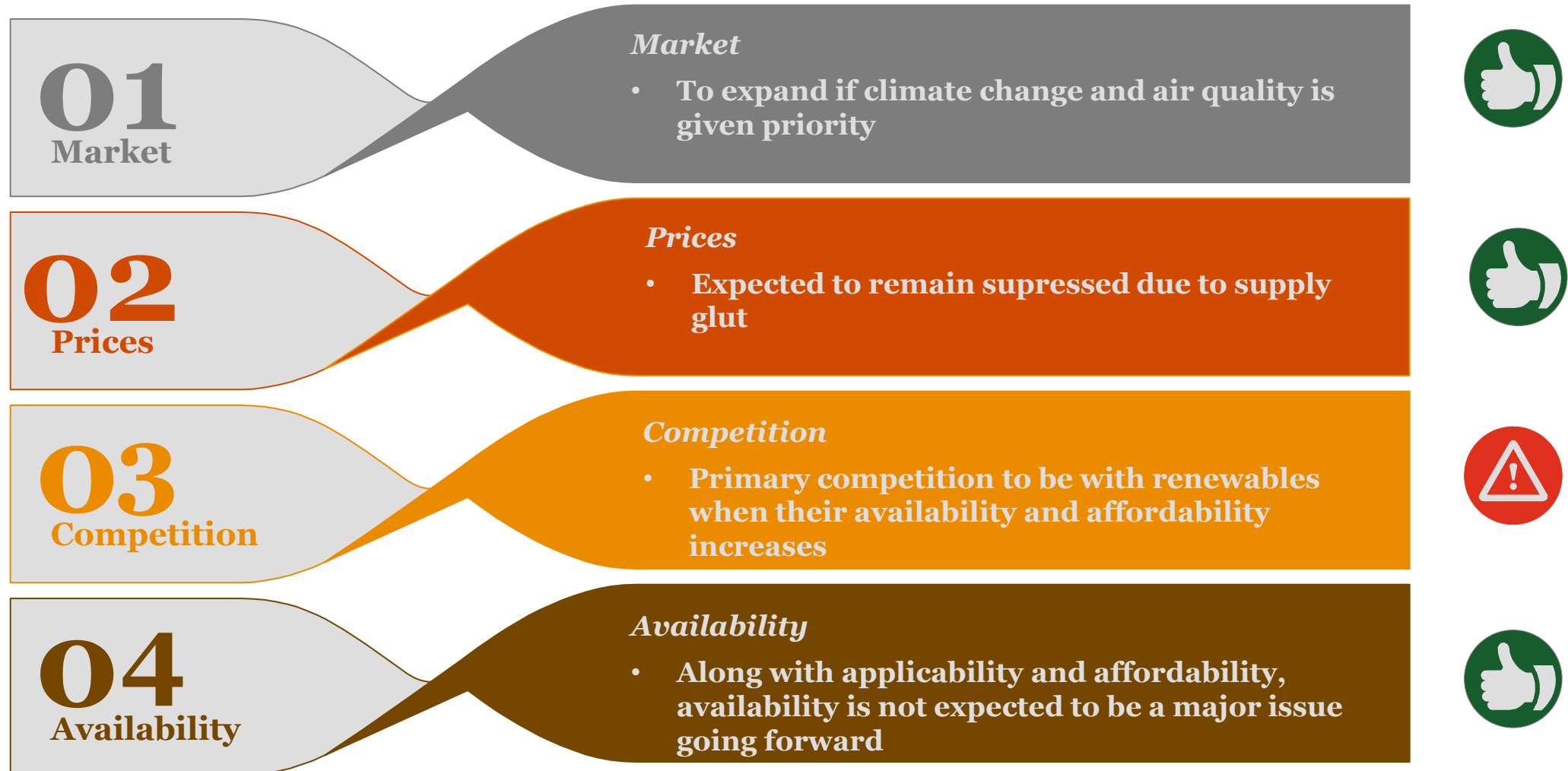
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Source: BP Statistics, PwC Analysis


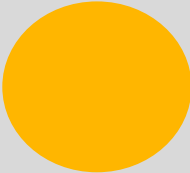

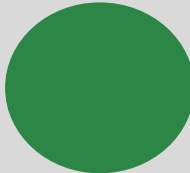

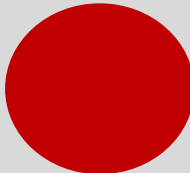


Sources of natural gas supply...



Drivers of Natural gas demand...



Long term outlook for natural gas...

	Current	Forecast
Market		
Prices		
Competition		
Availability		

New ideas gaining traction in India...

CNG for intracity buses

IGL has launched CNG busses with composite cylinders capable of travelling up to 1,000 Kms without refuelling

LNG transportation by trucks

GAIL has started such supply from Dahej to Bhubaneshwar. CGD companies are planning to use the same model in new GAs

LNG in long distance transport

Delhi Mumbai expressway to be converted to LNG highway with 12 LNG refuelling stations. PLL has already ordered 4 LNG buses from Tata motors

Compressed biogas as sustainable transport fuel

More than 500 LOIs already signed by OMCs to develop CBG plants in India, buy Bio-CNG at INR 46/ Kg and use the same as sustainable fuel for transportation

Sectoral reforms

Key areas being deliberated are: Inclusion of gas under GST; Unbundling of transporter and marketer roles; Uniform pipeline tariffs for the national gas grid

We invest in Relationships...

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