



Natural Gas Society  
Knowledge & Research



# Gas statistics

July 2017



**Petcoke Crying for Regulation** (see pg 6)

## GST Non Inclusion A Dampner Despite Other Positives

**S**o, GST is finally here. And since Natural Gas has been excluded from its ambit, it also means adding to the woes of the Gas industry specially the CGD sector. And although the MOPNG's pricing policy for difficult fields seems to have spurred on the major producers ONGC and Reliance to announce significant investments in their upstream business which could translate into additional availability of about 37 mmscmd of gas from 2020, it has not exactly lighted up the spirits as much as it would otherwise have.

It must also be stated that the MOPNG has been sympathetic on the issue and tried for inclusion of natural gas in the GST and there are reports in industry circles that gas could come within the ambit of GST sometime soon, maybe within a year. But the interim period is going to adversely impact the industry specially the CGD segment, more so the smaller entities which are likely to be the worst hit. There are other positives for CGD also. The recent move to treat the CGD industry on par with the public utilities is a very welcome step and has been a long standing demand of the entities. It should enable faster implementation of the projects.

One area which is now crying for immediate attention is the use of polluting fuels in industry. NGS had some time back in mid 2016, done a study on the impact of FO usage on the CGD industry. Our research revealed that at that time the CGD industry had suffered an erosion of about 20 per cent over two years owing to the uncontrolled and unregulated use of polluting FO by industries (see item pg 6). The Government is seized of the matter and hopefully something will emerge on this front also. But till then, with all the competing fuels like, FO, coal, LPG, coming under GST, and impacting both the CNG and the PNG segment, the double whammy of lower prices and disadvantage of being out of GST will certainly create difficult times.

Apart from FO, another fuel which impacts the environment adversely and constitutes a big usage barrier for the CGD business is Petcoke. However, there is no knowing the future impact. There is, therefore, an urgent need to regulate the sale and use of Petcoke only in those industries where the emissions are neutralised to acceptable and safe limits and possibly ban the use for any other usage specially in and near the urban areas. And while the NGT and EPCA have eased matters for NCR, we think that wherever natural gas or any clean fuel is available, its use should be disallowed and the ban strictly enforced. In this issue, the GSR team brings to you some aspects of the increasing use of petcoke in India and the consequent rising imports.

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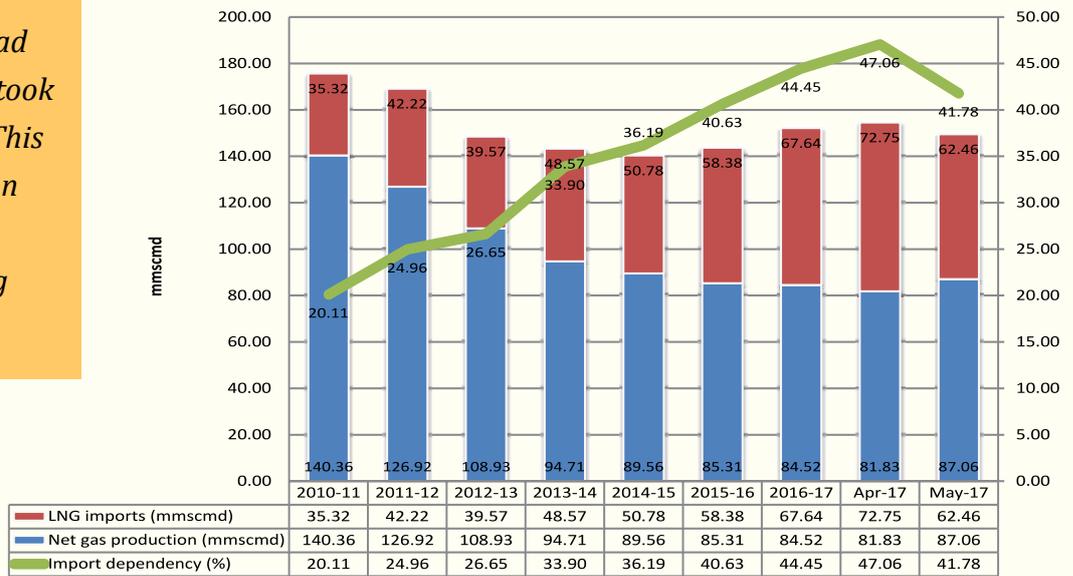
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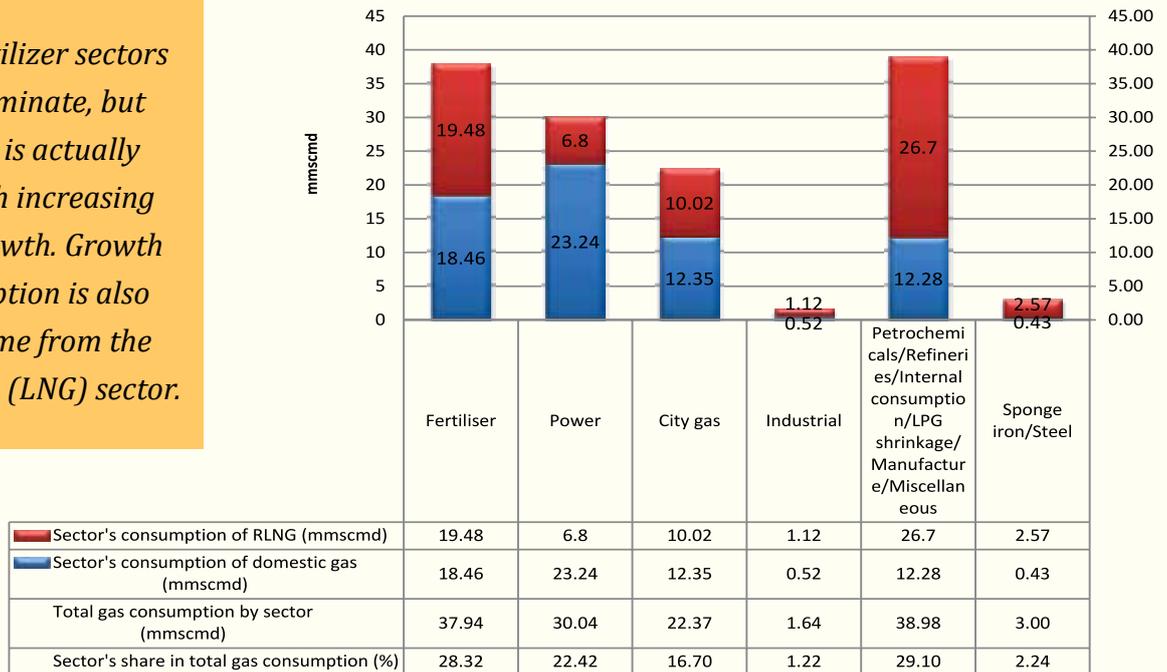
## Gas production/consumption/imports

Share of LNG which had been on the increase, took a beating in May 17. This is mostly an aberration and is expected to increase in the coming months/years.



## Sector-wise gas consumption of domestic gas and RLNG (April 2017)

Power and fertilizer sectors continue to dominate, but the CGD sector is actually expanding with increasing trend in its growth. Growth in gas consumption is also expected to come from the transportation (LNG) sector.

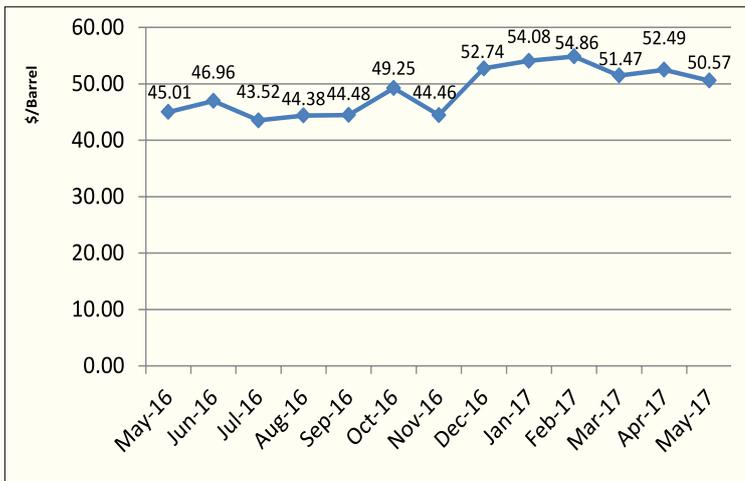


## Trend in production and consumption of crude oil and petroleum products

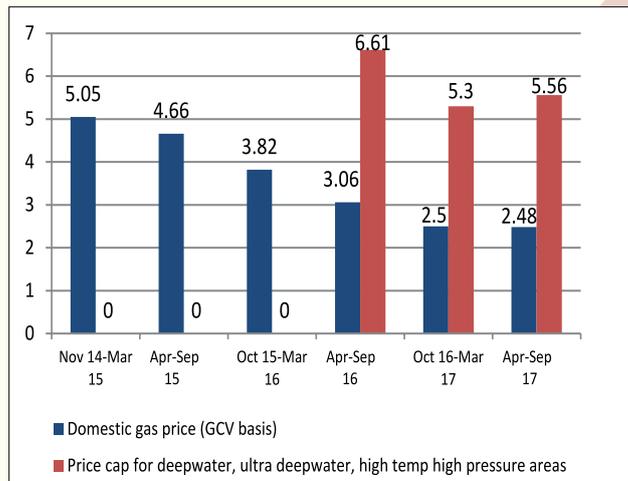
In '000 MT	Jun-16	Jul-16	Aug-16	Sep-16	Oct-16	Nov-16	Dec-16	Jan-17	Feb-17	Mar-17	Apr-17	May-17
Consumption of LPG	1613	1708	1840	1868	1850	1871	1932	1981	1808	1887	1649	1784
Consumption of Naphtha	1140	1206	1146	1108	1163	1061	1034	987	1073	1147	1136	1071
Consumption of petrol	1846	1918	2205	1815	2106	2026	1965	1804	1896	2106	2085	2402
Consumption of HSD	6384	5807	6134	5213	6675	6750	6560	5800	6159	6805	6954	7513
Consumption of FO & LSHS	634	596	582	666	610	580	611	542	536	567	594	597

# Gas - Price & Analytics

## Crude price (Indian basket)

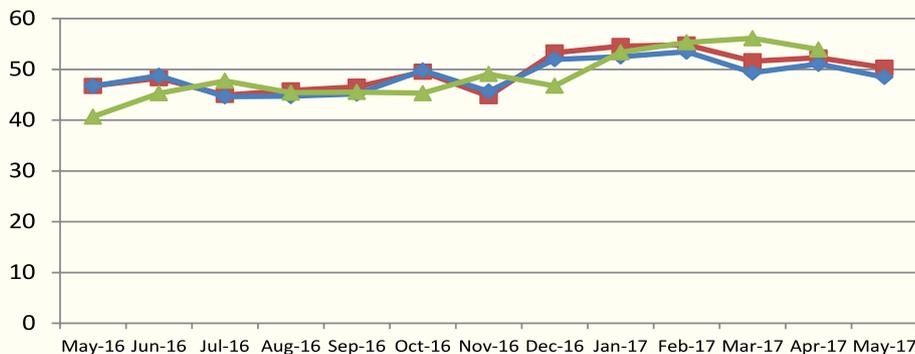


## Domestic gas price (\$/mmbtu)



## Brent/WTI/Japan oil import price (\$/barrel)

With increasing USA oil production & inventory levels, crude oil price has been adversely impacted. The recent Arab tangle has not affected the oil price.

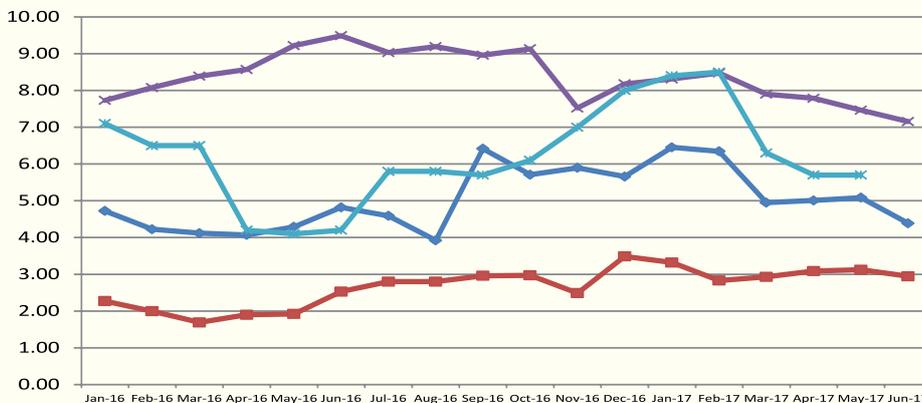


	May-16	Jun-16	Jul-16	Aug-16	Sep-16	Oct-16	Nov-16	Dec-16	Jan-17	Feb-17	Mar-17	Apr-17	May-17
Brent (\$/barrel)	46.74	48.25	44.95	45.84	46.57	49.52	44.73	53.29	54.58	54.87	51.59	52.31	50.33
WTI (\$/barrel)	46.71	48.76	44.65	44.72	45.18	49.78	45.66	51.97	52.5	53.47	49.33	51.06	48.48
Japan oil import price (\$/barrel)	40.68	45.28	47.74	45.4	45.52	45.3	49.08	46.76	53.36	55.3	56.12	53.9	

■ Brent (\$/barrel)    ◆ WTI (\$/barrel)    ▲ Japan oil import price (\$/barrel)

## International Gas/LNG prices (\$/mmbtu)

Spot and delivered prices have seen a downward trend with increasing supply. Henry hub has increased by 75% since March 16 low of \$1.69/mmbtu.



	Jan-16	Feb-16	Mar-16	Apr-16	May-16	Jun-16	Jul-16	Aug-16	Sep-16	Oct-16	Nov-16	Dec-16	Jan-17	Feb-17	Mar-17	Apr-17	May-17	Jun-17
European spot Indicator	4.72	4.23	4.12	4.07	4.29	4.82	4.59	3.92	6.42	5.71	5.90	5.66	6.45	6.34	4.95	5.01	5.09	4.39
Henry Hub	2.27	2.00	1.69	1.9	1.92	2.53	2.8	2.80	2.96	2.97	2.49	3.49	3.32	2.83	2.93	3.09	3.12	2.95
East Asian Delivered LNG Indicator	7.73	8.08	8.39	8.57	9.22	9.49	9.03	9.19	8.96	9.13	7.52	8.18	8.31	8.47	7.90	7.79	7.46	7.15
Japan LNG contract price	7.10	6.50	6.5	4.2	4.1	4.2	5.8	5.8	5.7	6.1	7	8	8.4	8.5	6.3	5.70	5.70	

## CNG Sales ('000 tonnes)

State	Company Name	2011-12	2012-13	2013-14	2014-15	2015-16	2016-17
Gujarat	GAIL Gas/ Adani Gas/ Gujarat Gas,GSPC, GGCL, SGL,HPCL, Vadodara Gas, Charotar Gas	409.1	441.8	463.5	475.9	503.06	546.3
Delhi	Indraprastha Gas (IGL)	649.3	695.1	697.6	717.1	738.3	803.8
Rajasthan (Kota)	GAIL Gas	0.2	0.8	1.6	2.6	3.68	4.27
Maharashtra	Mahanagar Gas Ltd.(MGL) Mumbai, MNGL Pune, GAIL Gas	382.8	425.1	476.0	531.4	565.01	592.6
Andhra Pradesh/ Telangana	Bhagyanagar Gas Ltd.( BGL) Hyderabad, Godavari Gas	15.8	24.7	24.6	25.8	27.45	28.53
U.P	Green Gas Ltd. (Lucknow), CUGL(Kanpur), Siti Energy, GAIL Gas, Sanwaria Gas, IGL, Adani Gas, IOC-Adani	112.6	137.7	162.6	184.8	211.61	245.42
Tripura	Tripura Natural Gas Co. Ltd.(TNGCL) Agartala	3.2	4.3	6.8	9.5	11.19	12.3
M.P	Avantika Gas (Indore) / GAIL Gas	10.7	14.5	15.9	16.6	19.19	21.59
Haryana	Haryana City Gas Ltd, GAIL Gas, Adani Gas	54.0	73.2	78.2	72.3	74.59	109
West Bengal	GEECL	0.0	0.6	1.2	1.2	1.36	1.64
Karnataka	GAIL Gas	0.0	0.0	0.0	0.00	0.00	0.01
Chandigarh	IOC-Adani Gas	0.0	0.0	0.0	0.0	0.0	0.0
<b>Total</b>		<b>1637.7</b>	<b>1817.8</b>	<b>1928.0</b>	<b>2037.2</b>	<b>2155.44</b>	<b>2365.5</b>

## CNG Stations & Vehicles (March 31, 2017)

State	Company Name	No. of CNG Stations	No. of CNG Vehicles
Gujarat	GAIL Gas/Adani Energy/Gujarat Gas,GSPC, GGCL, SGL,HPCL, Vadodara Gas	396	1094973
Delhi / NCR	Indraprastha Gas (IGL) New Delhi	421	939475
Maharashtra	Mahanagar Gas Ltd (MGL) Mumbai, MNGL Pune, GAIL Gas	245	685883
Andhra Pradesh/Telangana	Bhagyanagar Gas Ltd ( BGL) Hyderabad, Godavari Gas	42	39281
Rajasthan	GAIL Gas	3	5688
U.P.	Green Gas Ltd (Lucknow), CUGL (Kanpur), Siti Energy, Adani Energy, GAIL Gas, Sanwaria Gas, IOC-Adani	54	117686
Tripura	Tripura Natural Gas Co. Ltd (TNGCL) Agartala	5	9438
M.P.	Avantika Gas (Indore) / GAIL Gas	24	23310
Haryana	Haryana City Gas Ltd, GAIL Gas, Adani Gas	31	125227
West Bengal	GEECL	7	3172
Karnataka	GAIL Gas Ltd.	3	135
Chandigarh	IOC-Adani	2	1000
<b>All India</b>		<b>1233</b>	<b>3045268</b>

## CGD Factsheet as of June 2017

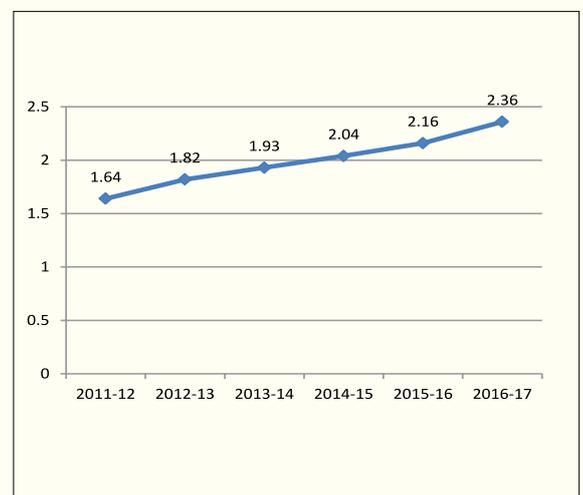
Total gas consumption by CGD (April 2017) mmscmd	22.37
No. of GAs covered	78
No. of CNG stations March 31, 2017	1233
Customer mix (million) March end 2017	
CNG vehicles	3.05
PNG connections	3.62

*Growth trajectory for CNG & PNG remains robust. Gas consumption in the CGD has grown by 36% in April 2017 as compared to April-December 2016.*

## PNG Consumers



## CNG Sales (million tonnes)



# CNG/PNG/Pipelines

PNG Status										
State	City Covered	Company	Sep-16				Mar-17			
			Domestic PNG	Comm. PNG	Ind. PNG	Total	Domestic PNG	Comm. PNG	Ind. PNG	Total
Delhi/NCR	Delhi, Noida, Greater Noida, Ghaziabad.	IGL	675480	1858	864	678202	742205	1903	962	745070
Maharashtra	Mumbai, Thane, Mira-Bhayandar, Navi Mumbai, Pune, Kalyan, Ambernath, Panvel, Bhiwandi	MGL, MNGL, Gujarat Gas	933098	3176	178	936452	999868	3387	191	1003446
Uttar Pradesh	Merrut, Mathura, Agra, Firozabad, Kanpur, Bareilly, Lucknow, Moradabad, Khurja, Allahabad	Green Gas Ltd. (Lucknow), CUGL(Kanpur), GAIL Gas, Sanwariya Gas, Siti Energy, Adani Gas, IOC-Adani Gas	38171	244	478	38893	51195	272	500	51967
Tripura	Agartala	TNGCL	25111	340	48	25499	28669	366	50	29085
Madhya Pradesh	Dewas, Indore, Ujjain, Gwalior	GAIL Gas, AGL	8683	44	82	8809	13888	63	99	14050
Rajasthan	Kota	GAIL Gas	187	1	16	204	157	1	16	174
Assam	Tinsukia, Dibrugarh, Sibsagar, Jorhat	Assan Gas Company	29363	967	392	30722	30023	1002	400	31425
Andhra Pradesh /Telangana	Kakinada, Vijaywada, Hyderabad, Kovvur	BGL, Godavari Gas	5385	46	5	5436	6608	46	5	6659
Haryana	Sonepat, Gurgaon, Faridabad	GAIL Gas, Adani Gas, Haryana City Gas	35744	138	221	36103	54414	166	241	54821
Karnataka	Bengaluru	GAIL Gas	1066	13	3		2446	17	3	2466
Chandigarh	Chandigarh	IOC-Adani Gas					2350	0	0	2350
Kerala	Ernakulam	IOC-Adani Gas					102	2	0	104
Dadra & Nagar Haveli	Dadra & Nagar Haveli	Gujarat Gas					58	5	3	66
<b>Total</b>			<b>3324166</b>	<b>22199</b>	<b>6387</b>	<b>3352752</b>	<b>3585646</b>	<b>21996</b>	<b>6670</b>	<b>3609326</b>

## Natural Gas Pipeline Network as on 31.03.2017

Network/Region	Entity	Length (Kms)	Design Capacity (mmscmd)	Pipeline Size	Average flow 2016-17 (mmscmd)	% Capacity utilisation 2016-17
Hazira- Vijaipur- Jagdishpur Pipeline /Gas Rehabilitation & Expansion Projects pipeline/ Dahej-Vijaipur Pipeline & Spur/Vijaipur- Dadri Pipeline	GAIL	4659.00	53.00	36"	33.16	62.57
DVPL-GREP Upgradation (DVPL-2 & VDPL)	GAIL	1119.00	54.00	48"	28.26	52.33
*Chhainsa- Jhajjar -Hissar Pipeline (CJPL) (including Spur lines) commissioned up to Sultanpur, Jhajjar- Hissar under hold (111 Km).	GAIL	265.00	5.00	36"/16"	0.97	19.34
Dahej-Uran-Panvel Pipeline (DUPL/ DPPL) including Spur Lines	GAIL	875.00	19.90	30"/18"	12.62	63.41
*Dadri- Bawana- Nangal Pipeline (DBPL), Dadri-Bawana:106Km, Bawana - Nangal:501 KM, Spur Line of BNPL : 196 Km.	GAIL	834.80	31.00	36"/30"/24"/18"	4.66	15.03
Dabhol -Bangaluru Pipeline (including spur)	GAIL	1097.00	16.00	36"-4"	1.17	7.32
Kochi-Koottanad-Bengaluru- Mangalore (Phase-1)	GAIL	48.00	6.00	16"-4"	1.03	17.08
Assam (Lakwa)	GAIL	8.00	2.50	24"	0.37	14.80
Tripura (Agartala)	GAIL	61.00	2.30	12"	1.44	62.61
Ahmedabad	GAIL	133.00	2.91	12"	0.26	8.93
Rajasthan (Focus Energy)	GAIL	151.40	2.35	12"	1.44	61.28
Bharuch, Vadodara (Undera) including RLNG+ RIL	GAIL	538.00	15.42	24"/16"	4.08	26.47
Mumbai	GAIL	129.00	7.03	26"	6.31	89.76
KG Basin (including RLNG+ RIL)	GAIL	881.00	16.00	18"	5.31	33.19
Cauvery Basin	GAIL	278.00	8.66	18"	2.65	30.59
East- West Pipeline (RGTIL)	Reliance	1480.00	80.00	48"	17.00	21.25
Gujarat State Petronet Ltd.(GSPL) Network including Spur Lines	GSPL	2612.00	43.00	Assorted	25.33	58.91
Assam Regional Network	AGCL, DNPL	816.80	3.24	16" and others	2.25	69.44
Dadri -Panipat	IOCL	140.41	9.50	30"/10"	4.34	45.70
Uran -Trombay	ONGC	24.00	6.00	20"	3.80	63.33
<b>Total</b>		<b>16150.41</b>	<b>383.81</b>		<b>156.44</b>	

*Average utilization of cross country pipelines continues to be low (40%). Both supply and demand are the main hurdles. The CGD sector could hold the key to market development by accelerating the implementing process.*

Source: PPAC \*CJPL and DBPL Pipelines are the extension of DVPL-2 / VDPL. GSPL Network average flow is as on 31.12.2016

# Petcoke - Urgent Need

India's efforts to reduce air pollution could be negated by its unregulated and unmonitored burning of petroleum coke, a fuel dirtier than coal. The rising trend in consumption of furnace oil and pet coke in the country is a fair indication of the complete disregard for our environment.

As most of us are aware, petroleum coke is a by-product of the oil refining process. As refineries worldwide upgrade and process more heavy crude to operate more efficiently and extract more high quality and high value fuels from each barrel of crude oil, more and more of a solid carbonaceous material known as petroleum coke is produced.

## The biggest concern : Environment and Health

Petroleum coke emits 11% more greenhouse gases than coal. In an industrial furnace, petroleum coke behaves like coal, but in the atmosphere its emissions are far worse than coal's. The sulphur content of pet coke varies between 65,000 to 75,000 ppm and due to its higher sulphur content, it contributes much more sulphur dioxide to air pollution than coal for each tonne burnt. Sulphur dioxide offsets the warming effect of greenhouse gases, but the offset is relatively short-lived before sulphur dioxide drops out of the atmosphere and can create health problems in urban areas/cities, while pet coke's higher greenhouse gas content lingers. Pet coke also contains various heavy-metal contaminants, including mercury, arsenic, chromium, nickel, and cadmium.

The sulphur level in pet coke is multiple times higher as compared to other fuel. It is for this reason India has moved from petrol/diesel with 10,000 ppm of sulphur in 1996 to 50 ppm in 2010 (extended nationwide in April 2017) and beyond 2020 to less than 10ppm. Petroleum coke contains 5-8% sulphur, which means a potential 1.5 million tonne of sulphur may be going in the environment through the chimneys of various factories in India.

What is worrying is that pet coke's rapid proliferation does not appear to have received serious attention from the Indian government and policymakers. Environment Pollution Control and Prevention Authority (EPCA) are seized of the problem and have recommended a ban on the use of pet coke. The Delhi Pollution Control

## Applications of petroleum coke/using industries

Petroleum coke has more than twice the calorific value of coal and is widely used as an additive/alternative to coal in power plants, cement kilns, foundry, aluminum industry and blast furnaces. Generally, low sulphur pet coke is used in industrial applications, including the production of aluminum, paint, colourings, steel, titanium dioxide, paper, bricks and glass. High sulphur pet coke is used as a fuel for power generation due to its ability to generate high levels of heat. It is often blended with coal for power generation. However, its diverse end-market applications and ease of availability has resulted in its growing demand.

Applications of Petcoke	Markets	Required Quality
Raw material for calcination	Aluminum TiO2	Low volatile (Max. 12%) Low levels of metals Lowsulfur
Carbonbasedreducer	Pig Iron Iron Alloys Carbides	Low sulfur High fixed carbon (>90%) Low levels of metals Granulometry (iron alloys and pig iron)
Raw material for coke kiln	Foundry	Low sulfur High fix carbon (>90%)
Raw material for coke kiln	Greatsteel industries	Low sulfur High fix carbon (>90%)
Fuel	Lime Great steel industries Ceramic red Pelletizing/Sintering Low sulfur High calorific value	Low sulfur High calorific value
Fuel	Cement Kiln Power Plants	High sulfur (>4%) High calorific value

Source: Carvalho and Assis

Committee (DPCC) had declared it as "unacceptable fuel" way back in 1996, but it is not banned outside Delhi borders and is being increasingly used by industries in the NCR, aggravating the pollution problem. When we compare the increasing consumption of petroleum coke to the consumption of coal in India, we realize that the contribution of pet coke could severely impact the efforts India has made in reducing the air pollution sources of sulphur dioxide.

## Increasing use of petroleum coke in India

The consumption of petroleum coke across the country has grown in leaps and bounds; since 2010-11 there has been a four-fold increase in pet coke consumption. During FY 2017, petroleum coke accounted for 40.2 per cent of the total petroleum products imports in India followed by LPG at 29.2 per cent. Not only pet coke, the

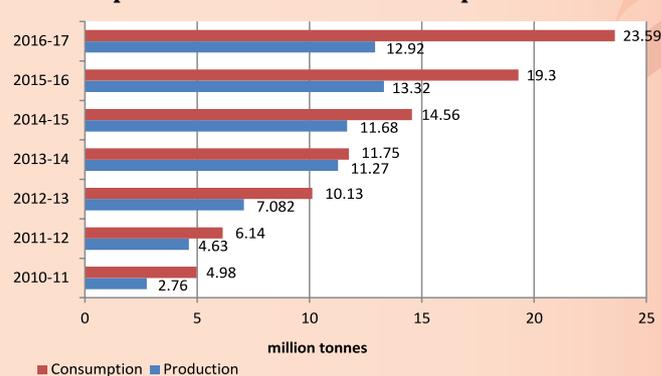
consumption of furnace oil, another dirty fuel, has also increased over the years. Compared to a furnace oil consumption of 5.96 MMT in the year 2014-15 the consumption in 2015-16 increased by 12% (6.6 MMT including imports), and further increased to 7.19 MMT in the year 2016-17.

The following table and chart are testimony to the significant growth in pet coke's consumption and imports. Currently, India produces 12-13 million tonne (MMT) of pet coke. The three private sector refineries in Gujarat produce about 8.5 MMT of pet coke which is equivalent to 66% of the total production. However, the more alarming and disturbing scenario is the soaring imports of pet coke in India. This financial year, India imported 14 MMT petroleum coke which was over 40% more than the previous year and resulting in a 22% increase in consumption when compared to the previous year.

Petcoke (million tonnes)			
	Production (RPC/Pet-coke)	Consumption	Imports
2008-09		6.166	
2009-10		6.586	
2010-11	2.76	4.98	
2011-12	4.63	6.14	
2012-13	7.082	10.13	
2013-14	11.27	11.75	
2014-15	11.68	14.56	
2015-16	13.32	19.3	10.04
2016-17	12.92	23.59	14.04

Source: PPAC, data before 2015-16 not available for imports/exports

Petcoke production vis-a-vis consumption in India



Contd..... page 8

## NGS 2016 Study On Fuel Oil

### CGD Cos. Lose Over 20% Sales To Polluting FO

A crash in crude oil price since June 2014 has prompted factories to reduce using gas for their energy needs and switch to furnace oil, a low-quality refined product that is usually cheaper than crude oil but an environment rogue. Consumers of natural gas and RLNG have switched faster to dirty liquid fuel in industries and regions where environmental laws are not strictly implemented. Most CGD companies including Mahanagar Gas, Gujarat Gas, Adani Gas, Haryana City Gas, Aavantika Gas, Maharashtra Natural Gas, Siti Energy, Central UP Gas and Indraprastha Gas are under pressure. The table below showing the trend of furnace oil sale as well as natural gas sales to industrial/commercial segments of some of the CGD entities is testimony to the dropping oil price.

Gas consumption in the industrial/commercial segment					
	MMSCM			Percentage decline	
	FY 13-14	FY 14-15	FY 15-16	FY 14-15	FY 15-16
Overall consumption/% decline	458.72	389.72	362.38	-15.04%	-7.02%
Furnace Oil Consumption		5.96	6.67		11.94%

\* Data from 7 CGD entities included above, one of the main CGD entities' data not available so figure would be even higher

The switch to liquid petroleum fuels is smooth as factories increasingly use equipment which runs on both gas and liquid fuel. The fuel oil (FO+LSHS) consumption in India has declined by 43% since 2009-10 mainly due to conversion of some large fuel oil based fertilizer plants to gas, the consumption in the year 2015-16 was 6.673 million tonnes (MMT) against 11.629 million tonnes in the year 2009-10. However, this trend in sales has started to reverse. Compared to a consumption of 5.961 MMT in the year

2014-15, there was an increase of 12 % (6.673 MMT) in the year 2015-16 (7.188 MMT in 2016-17). The increase in furnace oil consumption is impacting the natural gas sales of CGD companies to the industrial and commercial segments. And this trend is amply demonstrated by the current sale of natural gas to the industrial and commercial segments of some of the key CGD players (see above Table). It is also observed from CGD companies sales figures that natural gas sales to the two segments have shown a declining trend in the years 2014-15 and 2015-16. Natural gas sales to the industrial and commercial segment of these CGD companies have declined by 15% and 7% in the year 2014-15 and 2015-16 respectively. Compare this drop to the 12% increase in furnace oil consumption in 2015-16.

The sliding oil price has resulted into a lower price of fuel oil, thus making it more competitive to natural gas for similar applications in the industry. Even though it is a dirty fuel, but its price is attractive enough for it to substitute natural gas in industrial use. And given the current trend of consumption of furnace oil in the country, exports have declined and imports are showing an increasing trend as per PPAC data.

	2014-15	2015-16
Imports (MMT)	0.902	1.194
Exports (MMT)	4.762	2.806

We all know that natural gas is a clean burning fuel and its use should be encouraged because of its low GHG emission as compared to furnace oil/fuel oil. Furnace oil is high in sulphur content and therefore raises concern with respect to the environment and health of the citizens. We must discourage the use of furnace oil in urban centres to start with and then extend the same to the entire country.

## India - a dumping ground for world?

Despite our concerns for the environment, at this rate, we could end up consuming more than 30 MMT of pet coke in the coming years. The increase of petroleum coke production is a natural consequence of the increase of crude oil API degree currently available in the international market. This trend is reflected in the discovery of large unconventional oil reservoirs, extremely heavy and with high sulphur content.

USA, China and India are the three major petroleum coke producing and consuming countries. Whereas most pet coke consuming countries are either witnessing a marginal growth or a downtrend [see table below] in their annual consumption, India's consumption continues to increase by 20% year on year. India today has overtaken China in consumption of petroleum coke. India is not only one of the leading producers of petroleum coke but it is also having the dubious distinction of being the largest importer. USA continues to be the largest producer and exporter of pet coke.

Pet coke import of few countries from USA						
'000 bbls	2011	2012	2013	2014	2015	2016
Brazil	14101	12217	12907	13970	12501	11486
Canada	11537	10370	11806	10245	9506	8140
Italy	11459	9268	7077	7978	7176	6119
Japan	20596	20996	22105	22899	23454	20818
South Korea	2831	4558	2463	4209	3833	2129
Portugal	1103	1359	590	1552	1440	413
Germany	2033	1632	1174	620	815	2
China	24771	26179	38434	20845	18358	14228
India	5129	12814	13206	23548	26080	47570

Source: EIA

What is important to note here is that on one hand where both USA and China have been able to reduce their petroleum coke consumption significantly over the last few years because of strict environmental laws and government initiatives, India's petroleum coke consumption has grown by a whopping 400% between the year 2010-11 and 2016-17 primarily on the back of cheap imports.

## Gas takes the hit!

In the USA, the country's Environment Protection Agency has mandated rules for petroleum coke storage, as it fears contamination from heavy metals and particulates. And

*"The increased numbers in pet coke and furnace oil consumption have come at the cost of natural gas, a clean fuel. The competitive price of furnace oil and petroleum coke has adversely impacted natural gas sales across the country, especially of CGD companies in India"*

*"The same sulphur, which is removed from the automotive fuel, ends up in the bottom as petroleum coke. This, when burnt, will greatly add to air pollution"*

USA needs to dump this dirty fuel on the world. With the Chinese getting smarter about their air, India has become the dumping ground. We are buying the world's dirtiest fuel and the USA, which is the largest producer, is moving to cleaner natural gas or shale gas.

Whereas in India the increased numbers in pet coke and furnace oil consumption have come at the cost of natural gas, a clean fuel. The competitive price of furnace oil and petroleum coke has adversely impacted natural gas sales across the country, especially of CGD companies in India.

## Transplanting emissions from one source to another! Is this a good idea?

Given the above background and our journey into the auto fuel segment, from BS-III to BS VI, our refineries continue to pump out more and more of pet coke. With the expected introduction of BS-VI compliant fuel of much lower sulphur emissions by 2020, we would likely be producing more of petroleum coke, especially the private refineries processing sour heavy crudes. To meet BS-VI vehicle emission standards, refineries will have to further bring down sulphur to 10 ppm or lower. Consequent to the improvement in fuel quality, automobile manufacturers would also need to upgrade technology to take advantage of the improved fuel. However, the same sulphur, which is removed from the automotive fuel, ends up in the bottom as petroleum coke. This, when burnt, will greatly add to air pollution. It is just that instead of harmful emissions from the tailpipe of automobiles, these emissions will be transferred and emitted from the chimneys of industries burning pet coke.

## So, what is the way ahead?

The question then is what can be done with this by-product. The best would be to find a way to use it without adding to the pollution. But for this, we need to have a policy for petroleum coke. Currently, it is literally a vacuum.

The entire issue around regulating petroleum coke is complex. The country's power generation basically depends on coal. Petroleum coke used with coal increases the efficiency of power generation. Coal is polluting, but petroleum coke which has a higher content of sulphur is far more dangerous in terms of sulphur oxide emitted. A combination of regulation and restriction should work.

First, we could consider stopping the import of cheap petroleum coke by creating import barriers.

Second, we should use the domestic petroleum coke only in the industries where emissions can be controlled. For instance, in the cement industry's clinker plants. In the past

few years, cement makers have been increasingly relying on petroleum coke since it is a cheaper alternative to coal. Therefore, we must ensure friendly tax regime for petroleum coke or any restriction on its usage as a fuel for cement plants.

Third, we must bring into force stricter environmental rules and regulations for use of petroleum coke. Recent changes in China's environmental laws and their success in bringing down the consumption of petroleum coke in the last two years should be a model. China is on the verge of announcing the threshold level of sulphur allowed in pet coke, this could further impact imports, especially US pet coke exports to China which are predominantly high sulphur.

Fourth, introduce high penalties for offenders of the regulations. Tighter regulations on air pollution in China and USA have already impacted growth.

We would like to see a downward trend in petroleum coke consumption in India soon with tighter environmental

norms, import tariff barriers, restrictive use and heavy penalties for defaulters. A balance needs to be struck between production and consumption, however, whichever route we take, we must comply with emission standards for pollutants, especially in relation to sulphur dioxide. The current consumer market of petroleum coke needs to expand by including new technologies for the use of petroleum coke.

### Sources

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2. Analysis of Petroleum Coke Consumption in Some Industrial Sectors by Aldo Ramos Santos, Rogério José da Silva, Maria Luiza Grillo Renó
3. <https://www.pressreader.com/india/business-standard/20170227/282106341416855>
4. Indian Petroleum Statistics, Ministry of P&NG
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6. S&P Platts

## THE GST DOUBLE WHAMMY

Since natural gas has not been included under GST, the existing legacy taxes viz. Central Excise Duty, State VAT, Central Sales Tax will continue to be applicable on natural gas. Disparity in VAT rates applicable to natural gas in different states will continue to exist even in GST regime.

### Increase in cost of production/marketing of gas

Input tax credit of GST paid by upstream and mid-stream companies engaged in production and marketing of natural gas on procurement of goods and services used would not be available to these companies. The cost of imported LNG will also be further adversely affected as transportation of LNG by vessel and activity of regasification of LNG (which forms around 12% to 15% of total cost of RLNG) will attract GST and tax credit of same will not be available against sale of RLNG.

Both the above will lead to increase in the cost of production and marketing of natural gas and such companies will have to build-in such tax costs in the selling price of natural gas which in turn will increase the cost of industrial inputs in the hands of industrial consumers.

### High Cost for natural gas-based industries to further weaken gas' position against competitive fuels:

This will lead to skewed distortion in price against alternate products like coal, fuel oil and LPG for industrial and commercial and domestic consumers respectively. Natural gas already faces stiff competition from coal/coke and FO in CGD business owing to their lower prices. With the inclusion of these alternative fuels under GST and non-inclusion of CNG/PNG, this price differential will further increase leading to further erosion of CGD entities' business. There will be a higher cost of price for natural gas companies/ industrial/ domestic customers because:

- CGD Companies will not be able to offset the CGST, SGST or IGST paid on their various inputs, input services and capital goods (e.g. GST paid on procurement of capital goods such as compressors, dispensers, pipes and other capital goods and various input services such as security services, Works Contract services, Annual Maintenance Services) against their existing output taxes (i.e. Central excise duty and VAT) which would continue to be applicable on sale of PNG / CNG.
- Natural Gas is primarily an industrial input used as fuel/feedstock by industries like power, fertilizer, petrochemical, LPG and CGD. As gas based industry will not get benefit of tax credit of VAT paid on purchases of natural gas after introduction of GST, consumers of natural gas will not be able to offset taxes (i.e. VAT) paid on their procurement of natural gas against their output CGST, SGST or IGST, it will result in increase in cost of production of such industrial consumers and a dampener for its use.

### Increase in complexity due to dual compliance for GST and non-GST products

Post introduction of GST, CGD companies will not only have to comply to the existing indirect taxes (i.e. State VAT and Central excise duty), but will have to comply with taxation of supply of products and services (other than PNG and CNG) which are subject to GST (i.e. CGST & SGST or IGST), resulting in a lot of additional tax compliance and administrative burden not only for CGD Companies but also for the Government (both Central and State) including multiple audits, assessments under existing laws as well as GST laws, thus making tax compliance more complex.

## Annexures

### Global pet coke statistics for key countries

Petcoke Production (million metric tonnes)							
	2008	2009	2010	2011	2012	2013	2014
US	55.429	53.911	54.727	56.784	57.004	57.68	58.142
China	6.045	4.936	13.845	16.88	17.675	17.393	18.318
Brazil	3.268	3.515	3.484	4.281	5.075	5.483	5.413
Venezuela	7.723	8.253	9.235	7.291	7.109	7.324	4.955
Spain	1.057	1.111	1.15	1.543	3.086	3.435	3.744
Mexico	1.881	1.962	1.511	1.628	2.579	3.182	3.018
Russ.Fed	1.203	1.252	1.039	1.052	1.268	2.105	2.736
UK	2.029	2.07	2.106	2.18	2.072	1.773	1.745
India	NA	NA	2.76	4.63	7.082	11.27	11.68

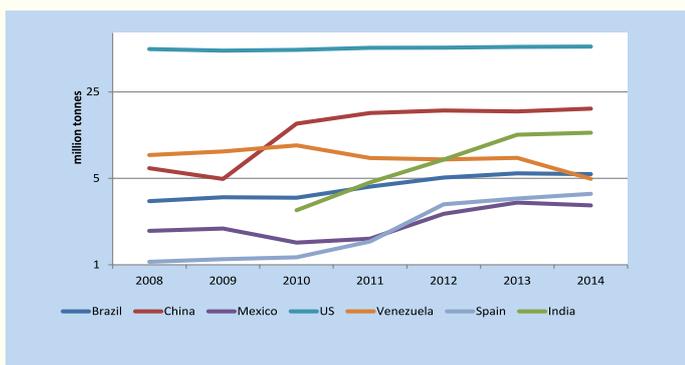
Petcoke Imports (million metric tonnes) (other countries)							
	2008	2009	2010	2011	2012	2013	2014
China	0.851	3.297	7.739	8.111	7.034	9.349	5.35
Japan	4.638	4.654	5.016	4.429	4.998	4.871	5.064
Brazil	4.03	3.746	4.419	5.01	4.232	4.305	4.38
Mexico	3.454	2.153	2.875	3.461	3.25	2.923	2.509
Canada	2.074	1.931	1.975	2.26	2.276	2.541	2.309
Spain	4.091	4.045	3.713	3.207	1.866	1.027	1.344
France	1.456	1.425	1.22	1.448	1.179	0.932	0.909

Petcoke Consumption (million metric tonnes)							
	2008	2009	2010	2011	2012	2013	2014
US	30.837	28.282	25.283	24.438	24.224	23.525	22.576
China	5.932	6.834	18.282	21.031	22.117	24.261	21.606
India*	6.166	6.586	4.98	6.14	10.13	11.75	14.56
Brazil	6.671	6.985	7.744	9.01	8.908	9.334	9.287
Japan	5.446	4.591	6.198	5.595	5.885	5.828	6.201
Mexico	5.158	3.922	4.295	5.101	5.22	5.395	5.427
Canada	4.005	3.55	3.685	3.881	3.906	4.095	3.782
Russ.Fed	1.203	1.252	1.571	1.696	1.844	2.627	3.233
Spain	4.628	4.681	4.376	4.076	3.379	2.22	1.919
UK	2.296	2.275	2.227	2.008	2.092	2.027	1.66
France	2.353	2.258	1.955	2.15	1.807	1.427	1.352

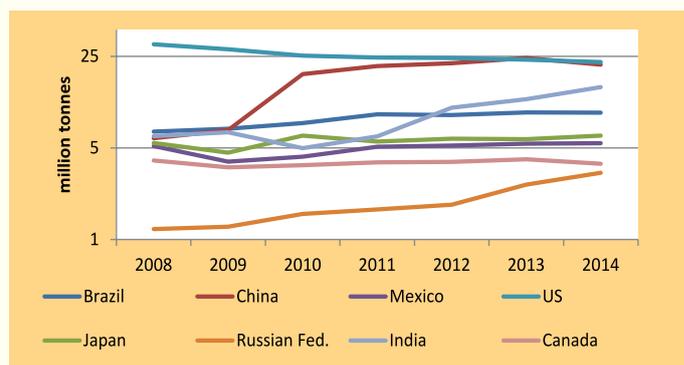
Petcoke Exports (million metric tonnes) (other countries)							
	2008	2009	2010	2011	2012	2013	2014
US	25.403	25.946	30.029	33.825	33.458	34.704	35.842
Venezuela	7.209	7.708	8.622	6.809	6.638	6.838	4.626
Spain	0.5	0.507	0.516	0.599	1.679	2.603	2.767
China	0.964	1.399	2.102	3.11	2.292	2.321	2.443

\* taken data for financial years from 2008-09 to 2014-15 for India from PPAC  
Source: UN Data

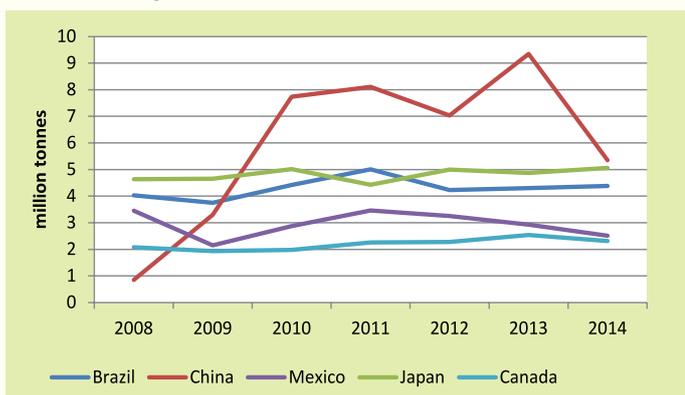
### Petcoke Production



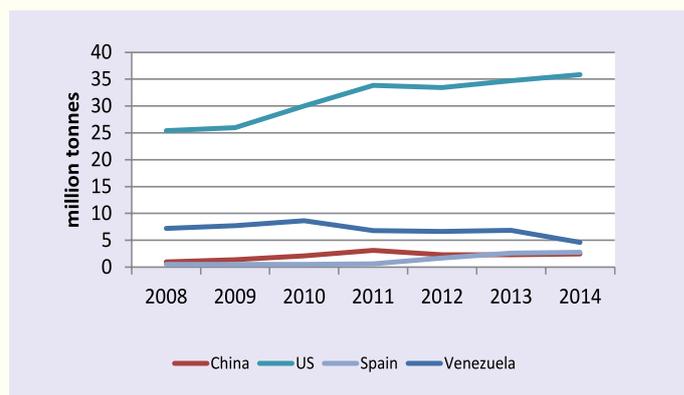
### Petcoke Consumption



### Petcoke Imports



### Petcoke Exports



## Events update

### IGL launches unique health support CSR initiative for drivers

Indraprastha Gas Limited has launched a two-month long preventive healthcare campaign focused on auto, taxi and bus drivers. The Swasth Saarthi Abhiyaan (SSA), was launched by Union Minister for Science and Technology and Earth Sciences and Environment, Forest and Climate Change, Dr Harsh Vardhan and Minister of State (Independent Charge) for Petroleum and Natural Gas, Mr.Dharmendra Pradhan.



Under the campaign, free basic health check up to drivers will be provided at all IGL Stations in the national capital till 31st August 2017.

According to Mr.Pradhan, IGL in association with the St Stephen hospital will offer free blood test, sugar test, eye test and the facility for cataract surgery to drivers. The company also plans to provide health insurance, which would also include death benefits, to drivers in the city.

The Swasth Saarthi web application, which will give drivers easy access to their health records online, was also launched on the occasion.

### GAIL India Launches Digital Campaign #Switch2Swachh

On World Environment Day, GAIL India launched a digital campaign, #Switch2Swachh. With the latest campaign, GAIL has taken the charge to change the air quality level with collective efforts from society as well and even hosted car pollution check-up camps. With this campaign, GAIL is aiming to enable a cleaner greener India and to ensure an ecological balance in the country.

As per the recent reports, the Central Pollution Control Board (CPCB) has marked the air quality for both Delhi and Gurgaon as poor and the Air Quality Index (AQI) for Particulate Matter (PM) is alarmingly higher than the safe

levels here. Keeping in notice, GAIL came up with such an initiative of setting up these camps as it was an immediate need of the hour.

The camps are set up at the Fuel Station next to Safdarjung Airport at Jor Bagh Station and HP Fuel Pump next to Hotel Ashoka, checked and serviced cars, enabling their emissions to be within the permissible levels.

### MGL inaugurates its 200th CNG filling station in Badlapur

Mahanagar Gas Limited has crossed the 200th CNG station mark in Mumbai Metropolitan Region. The company commissioned its 200th CNG filling station in Badlapur recently.

In the MMR, MGL caters to over 5 lakh vehicles plying on CNG through its network of 200 + CNG stations with over 1100 dispensing points and a compression capacity of over 28 lakh kgs of CNG per day. The 200th station aims at deeper penetration of CNG in the Kalayn-Dombivli, Ambernath and Badlapur region.

IRaajev Mathur, Managing Director of MGL, said, Mahanagar Gas has been meeting the demand for CNG efficiently and judiciously. Ease of access and accessibility of CNG stations across our operational areas is the driving force of our CNG network and with the 200th CNG station. This is a step towards facilitating the increasing number of customers in the MMR.

### Petronet in talks to buy stake in GSPC's Mundra LNG terminal

Petronet LNG Ltd, India's biggest importer of liquid gas, is in talks to buy 25% stake in Gujarat State Petroleum Corp.'s (GSPC) almost complete Rs4,500 crore Mundra LNG import terminal in Gujarat.

The 5-million tonne a year import terminal, the third facility in Gujarat for import of natural gas in its liquid form in ships, is nearing completion and GSPC is keen to shed some of its stakes to lighten its debt burden.

GSPC first offered its 50% stake in the project to state refiner Indian Oil Corporation (IOC), but the company was willing to take no more than 25-26%. So now, GSPC is talking to Petronet for selling 25% stake, according to media reports.

The Adani group holds 25% interest in the LNG import terminal. GSPC LNG, a unit of GSPC, will hold 25% stake, similar to IOC and Petronet once the deal concludes.

Petronet operates a 15 metric tonne a year LNG import facility at Dahej in Gujarat and has another 5-mt a year terminal at Kochi in Kerala.

### Record 71 students of GAIL Utkarsh Super 100 clear IIT-JEE

GAIL (India) Limited, in line with their endeavour to support and sponsor 100 odd students under its flagship program of GAIL Utkarsh Super 100, attains a record breaking high, with 71 students in the IIT-JEE, clearing out of 96 students qualified in the mains. This is by now the biggest score of successful candidates that GAIL nurtured

# Events update

through Centre for Social Responsibility and Leadership at the Kanpur center.

Started in 2009-10 with GAIL Utkarsh 30, the second stint of the program was for 60 students in 2010-11 which then culminated to GAIL Utkarsh 100 from 2011-12 onwards. Till last year, a total of 511 students were admitted to study engineering in prestigious institutions including IIT-JEE and NITs.

GAIL has been undertaking the developments of poor but talented students whose parents' annual income come up to INR 2.50 lakh per annum. Students are selected via open tests conducted through a school to school outreach program and interviews. They are given free coaching with mock exams being conducted in addition to class room teachings at the center.

### Natural Gas Society welcomes MNGL, CUGL as its new members

GNatural Gas Society welcomes its new members MNGL and CUGL. Maharashtra Natural Gas Limited, which currently supplies CNG in Pune & Pimpri-Chinchwad city including adjoining areas of Hinjewadi, Chakan & Talegaon, and plans to expand in other regions in Maharashtra recently bacem a member of NGS.



Central UP Gas Limited too recently joined hands with NGS as its member. CUGL was constituted for developing City Gas Distribution project in Kanpur.



*The Natural Gas Society (NGS), a registered society under the Societies Act, is the emerging voice of the Indian natural gas industry and has been established to catalyse the development of the industry. NGS seeks to establish itself as an industry think tank and to provide critical inputs into sectoral policy through research, collaboration and dialogue. NGS aims to encourage competitiveness of domestic gas industry. NGS aims to provide a forum for exchange of ideas and to develop best practices for the Indian gas industry, especially in transmission and distribution segments of value chain.*