Report No 91

Pet coke import for Aluminium, Calciner and Steel industry in context of the restriction imposed on pet coke usage and import in the country and recommendations to ensure that we realize the pollution gains of reduced pet coke consumption

October 6, 2018

Environment Pollution (Prevention and Control) Authority for NCR (EPCA)

On 23.8.2018, the Hon'ble Supreme Court listed applications of the Indian Steel Association, Rain CII Carbon, Goa Carbon Ltd, Sanvira Industries Ltd, Kalinga Calciner Ltd, Petro Carbon and Chemicals Pvt Ltd and application for clarification on behalf of Aluminium Association of India for further hearing on 9.10.2018. This report by EPCA is being filed on the above applications, which have sought permission from the Hon'ble Court to be allowed to import pet coke.

This is following the Office Memorandum of the Directorate General of Foreign Trade (DGFT) on August 24, 2018:

- "Import of pet coke for fuel purpose is prohibited. However, import of pet coke is "free" for cement, lime kiln, calcium carbide and gasification industries for use as feedstock or in the manufacturing process only on Actual User basis. Ministry of Environment, Forest and Climate Change, in consultation with customs and Directorate General of Foreign, will bring out detailed guidelines on regulating and monitoring the imported pet coke."

This order of DGFT has been issued in response to the directions of the Hon'ble Supreme Court on July 26, 2018 in which it had recorded the deliberations held between EPCA and MOEF&CC on the pollution potential of pet coke. The Hon'ble Supreme Court had directed as follows:

"It is quite clear that a consensus decision has been taken that the use of imported pet coke all over the country may be permitted only in the following industries : cement, lime kiln, calcium carbide and gasification. It is stated that this would be in compliance with the WTO norms and these industries may be permitted to import pet coke for use as a feedstock or in the manufacturing process and not as a fuel.

EPCA has also stated that it will prefer an arrangement, which prioritizes the use of domestic pet coke as against imported pet coke."

Since then the Hon'ble Supreme Court has permitted in addition the Graphite Electrode industry to use and import pet coke (directions passed on September 6, 2018).

EPCA has examined the following issues:

1. Should these industries, namely Aluminium, Calciner and Steel be allowed to use and import pet coke?
2. What will be the pet coke consumption in the country if the use is restricted to these industries, which use it as feedstock?

EPCA concern is that pet coke is a highly polluting fuel and therefore, after months of deliberations there has been an agreement to control the import of this fuel. The exemptions given to industries should not negate the efforts being made to control the usage of this fuel in the country.

This is all the more important as it is difficult to ensure that the industries do not use the fuel for combustion or that the use of the pet coke does not lead to pollution because of fugitive emissions.

For instance, Graphite India is a company, which EPCA had recommended to the Hon'ble Supreme Court, should be allowed to import pet coke (EPCA report No 90). EPCA in its report had stated that the graphite industry used the product, which was high grade needle pet coke for manufacture of graphite electrodes. The industry had also informed EPCA that it was meeting all emission norms. It is on this basis EPCA recommended to the Hon'ble Supreme Court that graphite electrode industry (which has 2 companies, HEG and Graphite India) should be allowed to import pet coke.

However, it was subsequently brought to EPCA's attention that Graphite India's plant in Whitefield, Bengaluru was responsible for pollution in the vicinity. The local community has complained about the presence of black dust in their homes, which is endangering their health. EPCA discussed this matter with representatives of the Graphite India and the Karnataka state pollution control board. The industry representatives informed EPCA that while the Whitefield plant was not using imported pet coke, it was using Indian pet coke. The state pollution board also informed EPCA of its recent visit to the plant and

confirmed the presence of black particles in nearby homes. It was agreed that the likely source of pollution was the fugitive dust from the plant. Graphite India assured EPCA that it would take all measures to ensure that pollution is mitigated within the next 3 months. ***This matter, however, highlights the need for caution in allowing industry to use this highly polluting fuel***.

The report is in two parts;

A: Industry-specific exemptions
B: Estimation of total quantity of pet coke that will be consumed and the safeguards needed to ensure that the fuel does not add to the pollution burden in the country.

Part A: Industry specific exemptions:

A.1.1 Calciners

This industry imports different grades of pet coke and then upgrades this produce to produce calcined pet coke through removal of moisture, volatile matter and by changing the crystalline structure. The pet coke is used as a feedstock in the manufacturing process and not as a fuel. The calcined pet coke is sold to the Aluminium industry for feedstock in smelting process.

There are 28 calciners in the country, of which 6 are port based and entirely dependent on imported raw pet coke. These 6 calciners, manufacture 72 per cent of the calcined pet coke produced in the country.

The 6 companies are as follows:

1. Rain CII Carbon, plant based in Vizag, Andhra Pradesh
2. Sanvira Industries, plant based in Vizag, Andhra Pradesh
3. Goa Carbon, with plants in Goa, Paradeep (Orissa) and Bilaspur (Chattisgarh)
4. Kalinga Calciners Pvt Ltd, plant based in Paradeep (Orissa)
5. India Carbon Ltd, plant based in Budge Budge, West Bengal
6. Petro Carbon N Chemicals Pvt Ltd, plant in Haldia, West Bengal

The industry cannot use domestic pet coke as that grade – called anode grade – is not readily available. The structure of the pet coke in India is different and therefore, import becomes essential.

The industry also provided EPCA with details of the quantity required by the industry (see Annexure 1).

According to this estimation, the 6 industries, with combined production capacity of 1.17 million tonnes require 1.36 million tonnes of imported pet coke to produce 1 million tonnes of calcined pet coke annually.

The industry has also informed EPCA that it meets SO2, NOx and particulate emission standards, as stipulated by CPCB.

A.1.2 EPCA Recommendation on Calciner Industry

The calciner industry should be allowed to import pet coke as its industry uses it for feedstock and not for fuel. This import is required as anode grade pet coke is not available in sufficient quantities in the country.

A.2.1 Aluminium industry

The Aluminium industry requires calcined pet coke as an anode in its electrolysis process. EPCA had already examined this matter and submitted a report on March 22, 2018 (Report no 82), in which it had recommended that the industry could be permitted to use pet coke as it was a feedstock. The aluminium industry also has stipulated emission standards for NOx and SOx, notified as of January 29, 2018. However, EPCA in its report, had not recommended use of imported pet coke by this industry.

The question that EPCA posed to aluminium industry was why it needed to separately import pet coke given that calciner industry was importing pet coke for its usage.

The data, submitted by aluminium industry to EPCA (see Annexure 2), is as follows;

1. There are 4 aluminium manufacturers in the country with a combined production capacity of 4 million tonnes per year.
2. The aluminium industry combined requirement of calcined pet coke is 1.4-1.6 million tonnes.
3. Of this requirement, roughly 1 million tonnes is supplied by domestic calciner industry. The remaining, roughly 0.4-0.6 million tonnes requires to be imported by the industry.

The aluminium industry only imports *calcined* pet coke.

DGFT has a separate HS code for calcined pet coke, which allows this import to be tracked separate from fuel grade raw pet coke. BIS has also issued standards for sulphur levels in calcined pet coke (revised based on representations by the aluminium industry from 1.25% of sulphur to 3.5% of sulphur).

A.2.2: EPCA's recommendation on aluminium industry

EPCA would reiterate its previous recommendation that aluminium industry should be allowed to use calcined pet coke.

Given that there is a deficit on calcined pet coke in the country and given the requirement of the industry for a particular grade and structure of pet coke, *EPCA would recommend that aluminium industry be allowed to import calcined pet coke for its use*.

EPCA's understanding is that this industry would require roughly 0.4-0.6 million tonnes of imported *calcined* pet coke annually.

The BIS has already set standards for sulphur levels in calcined pet coke and DGFT has a separate code for calcined pet coke. India imported 1 million tonnes of calcined pet coke in 2017-18, against 12 million tonnes of raw-pet coke. The sulphur content in calcined pet coke is up to 3.5 per cent as against 7-8 per cent sulphur content in raw pet coke.

A.3.1: Steel industry

EPCA in its report 87, of July 11, 2018 and again report no 89 of August 9, 2018, had examined the issue of pet coke import for the steel industry. It had expressed reservations: firstly, pet coke was not essential for the functioning of the steel industry and secondly, this permission would open floodgates for other industries to raise similar demands. This would negate all efforts to curtail the use of this extremely polluting fuel. EPCA had also cautioned that monitoring emissions from the coke oven was a challenge. It was decided that this issue would be further examined; CPCB would study the SO2 emissions in steel plants to assess the pollution potential of this usage.

On October 4, 2018, EPCA has received the report of this study from MOEF&CC (Annexure 3). The report, which monitored emissions of M/S JSW plant in Bellari district of Karnataka between August 15-18, 2018, has the following conclusions:

1. The increase in SO2 emissions due to use of pet coke blend of 5 per cent with coal in the recovery and non-recovery type coke oven was not substantial as monitored SO2 levels were within the prescribed limits of 800 mg/Nm3.
2. The study shows that SO2 emission from non-recovery coke oven is about 10 fold higher than recovery type, but still under emission limits (with 5 per cent blend).
3. The steel industry has installed online continuous emission systems (OCEMS) to monitor its pollution. However, the report says that "there is a need to strengthen the monitoring by installing similar systems in the coke oven gas, which is used for fuel.

Based on this, CPCB has recommended that the use of low or high sulphur pet coke in coke ovens may be permitted subject to compliance to the applicable standard of 800 mg/Nm3.

EPCA would like the opportunity to discuss these findings with MoEF&CC and to finalise its recommendations to the Hon'ble Supreme Court.

EPCA's concerns are as follows:

1. CPCB has noted that emissions have increased with even a 5 per cent pet coke blend in the coal used in the coke ovens of the steel plant. In the non-recovery type coke oven this increase was 10 fold higher than in the recovery-type coke oven. In other words, if the blend of pet coke increases in the coal then the emissions will go up further and would not possibly be within limits.
2. CPCB has also noted that the online monitoring system needs to be improved to monitor emissions from the coke ovens. How will this be done?
3. The total quantity of pet coke usage by steel industry, if the 5 per cent blend is allowed, is not clear. It is not clear if other steel companies also require this 5 per cent blend of pet coke in their production and if so, what is the quantity of pet coke that is required by the steel sector?
4. Most importantly, as this usage requires burning of pet coke in the coke oven plant, will it not open the floodgates for other industries to seek similar exemptions. The limited exemption given to the use of pet coke as a "feedstock" will be difficult to monitor and the entire effort to curtail use of pet coke will be defeated. This also reveals the need for clearly definition of use of pet coke as process/feedstock.

A.3.2: EPCA's recommendation on the steel industry

There is a need to further examine this matter with MOEF&CC. Till then, EPCA is not in a position to recommend the use of pet coke in steel industry.

Part B: What will the total usage of pet coke given the restrictions imposed and permissions given to industries

The effort to limit the use of pet coke is driven by the pollution potential of this fuel. It has been established firmly that burning pet coke is more polluting that coal (other than in small boilers, where it was decided that monitoring emissions of SO2 would a challenge and therefore, usage as fuel should be banned).

Based on this the following actions have been directed:

1. Pet coke usage as fuel in NCR states (Delhi, Haryana, Rajasthan, UP) has been banned.
2. Standards for SO2 and NOx have been set so that emissions from coal burning (the most likely substitute fuel) are also monitored and controlled.
3. Import of pet coke has been banned other than for industries that use it as feedstock in their manufacturing process (not as fuel). The industries that have been provided this exemption are as follows:
   Cement,
   Lime-kiln
   Gasification,
   Calcium Carbide
   Graphite Electrode

   In addition, the following industries are before the Hon'ble Supreme Court seeking permission:
   Calciner
   Aluminium
   Steel

4. DGFT has written to EPCA clarifying that under National Treatment principle (Article 3 of GATT) there cannot be any discrimination between imported pet coke and domestically produced pet coke (Annexure 4).

> "In other words, to be consistent with our WTO commitments, if imported pet coke is prohibited for fuel purpose, domestically produced pet coke also will be subject to the same prohibition. Similarly, domestically produced pet coke will be subject to restricted use only in those sectors where imported pet coke can be used."
>
> "This means we have to bring out legislative/other measures to prohibit domestically produced pet coke to be used for fuel purpose and to restrict use of domestic pet coke only for cement, lime kiln, calcium carbide and gasification industries."

As per this letter, it is clear that to stay compliant with WTO regulations, the usage of domestic and imported pet coke must be restricted only to those industries that use it as a feedstock and not as fuel. This list is restricted to the industries, which have got specific permission to use it and where MOEF&CC has established that this use is for feedstock and is benign.

5. On September 10, 2018 MOEF&CC has issued guidelines for regulation and monitoring of imported pet coke in India (see Annexure 5). The guidelines provide for the following:
   a. All pet coke importing industries are required to obtain consent/registration with state pollution boards.
   b. The consent will specify the quantity permitted for import and its use on a month/annual basis
   c. Import of pet coke for trading is not permitted.
   d. The data will be collated and publicly available on the website of the CPCB, updated on a quarterly basis.

B.1 Domestic and imported pet coke availability and trends

The data for pet coke production and import is as follows (see Annexure 6 for import of pet coke till July 2018 (domestic data is till August 2018):

	Domestic (million tonnes)	Imported (million tonnes)	Total available/usage (million tonnes)	Per month available/usage (million tonnes)
2017-18	13	12.78	25.78	2.15
2018-19 (till July)	6.4*	2.67	9.07	1.8*

- Domestic pet coke data is from April-August 2018

The data for import of pet coke shows that during 2017-18, India imported slightly more than 1 million tonnes of pet coke every month.

In 2018-19 (till July), this import is 0.66 million tonnes per month – down by 35%.

B.2 Estimation of usage in permitted industries

EPCA has found it a challenge to get data on usage of pet coke in the permitted industries, particularly cement and limekiln.

Pet coke usage in cement: As it emerges the cement industry will be the largest user of pet coke in the country. It is also a concern that pet coke, which has been permitted for feedstock, can be used as combustion as most of the cement plants have captive power plants within their estates. Therefore, the chance of misuse is obvious and possible. It is also clear that the emission monitoring systems that would catch the increased emissions from the industry are weak and the systems for enforcement even weaker.

It is also a point of concern that the data on cement manufacturing is not available in the public domain. Pet coke as a feedstock is used in the clinker production of the cement plants. To independently estimate or to verify the usage of pet coke requirement in cement, the total quantity of clinker manufactured in the country is needed. This is not available. Even the data on the total cement manufactured in the country is not available through government/public sources.

The Cement Manufacturers Association of India (CMA) has informed EPCA that the Competitive Commission of India (CCI) has passed directions that companies will not share production data and that this data will not be collated. In other words, there is no estimation provided by government of the actual cement and clinker manufactured in the country. This makes the task of estimating pet coke usage difficult.

EPCA has used two different sources to estimate the requirement of pet coke by cement industry, estimate by the CMA and estimate of how much domestic pet coke has been sold to cement companies.

The CMA estimate (many plants have still not provided information) is as follows: (Annexure 7):

- Production of cement in the country is 223 million tonnes in 2017-18 (against an installed capacity of 332 million tonnes).

- Production of clinker is 168 million tonnes (against 237 million tonnes installed capacity for clinker)

- Based on the above, their estimation is that actual pet coke consumption for cement (as feedstock) is 10.6 million tonnes in 2017-18. This estimate does not include use of pet coke by plants (who are members of CMA, but have not provided data).

This estimate does not include ACC or Ambuja Cement as they are not members of the association.

- *When the requirement (estimated) of ACC and Ambuja is added by the association, then the annual pet coke requirement as feedstock for cement sector is 12.8 million tonnes.*

EPCA has not been supplied information by ACC or Ambuja in spite of requests. EPCA also does not have any way of independently verifying that this quantity of pet coke is required in cement industry.

However, EPCA also got information from the Centre for High Technology of the Ministry of Petroleum and Natural Gas (MoPNG) about sales of pet coke to cement industry by Indian refineries.

This data (see Annexure 8) shows that in 2017-18, the domestic refineries sold 60 per cent of their pet coke to cement industry, which equals to some 7.8 million tonnes.

In 2018-19 (till August) Indian refineries have sold 70 per cent of the pet coke to cement industry, which equals to some 4.5 million tonnes.

There is no information about the import of pet coke by this industry. Therefore, it is not possible to accurately and independently assess usage.

Based on the above, EPCA has done a rough estimation of the quantity of pet coke that will be required by permitted (and still to be permitted) industries.

Budget of pet coke to be used by permitted and (still to be permitted) industries

	Industrial sector	Million tonnes	Remarks
1.	Cement	10-13	This estimation is not verified (explained above)
2.	Lime Kiln	No data	Small scale industry and data for countrywide usage is not available
3.	Gasification	8	Only plant of Reliance is expected to be commissioned in coming years. The requirement is estimated to be 8 million tonnes. Reliance produces some 5-6 million tonnes of pet coke annually
4.	Calcium carbide	No data	But small requirement as plants are limited
5.	Graphite electrode	0.1	Small requirement and specific to needle coke
6.	Calciner*	1.4	Will import fuel and calcined grade pet coke but of anode grade
7.	Aluminium*	0.5	Will import calcined pet coke
8.	Steel*	No data	Not recommended by EPCA

- Still to be permitted

In other words, till the gasification plant of Reliance is commissioned, the requirement for pet coke as feedstock is roughly between 12-15 million tonnes.

In other words, domestic pet coke should be sufficient to meet all requirements (other than the need for special grades of pet coke, which are not available in the country). Certainly the bulk of the cement industries requirement, which is for fuel grade (raw) pet coke can be met through domestic sources.

Therefore, if there is strict enforcement then there should be reduction in the usage of pet coke from roughly 26 million tonnes in the previous year to 12-15 million tonnes in this year (the use by cement industry needs verification).

If this is done, then the pollution abatement gains would be substantial. The CPCB report (as per the MoEF&CC affidavit dated July 26, 2018) clearly shows:

- Emissions from pet coke usage are 5-6 times higher than coal in thermal power plants;
- Emissions from pet coke usage are 3-6 times higher in industrial boilers (15-40 tonnes/hour).

But realising the pollution gains of reduced use of pet coke will need much strengthened regulations and enforcement. EPCA's recommendation on this are below.

C. EPCA's Recommendations for the consideration of the Hon'ble Court

C.1 On the import of pet coke by additional industries using it as feedstock:

1. Calciner and aluminium industry may be allowed to import pet coke for use as feedstock
2. Steel industry may not be allowed to import pet coke, till further discussions are held between EPCA and MOEF&CC to clarify pending issues

C.2 On the strengthening of regulations to ensure pet coke usage is monitored and the pollution gains are realised

1. MoEF&CC/MoPNG should issue necessary directions mandating the use of pet coke only in the permitted industries as per DGFT letter to EPCA.

2. MoEF&CC should further strengthen implementation of its September 10, 2018 guidelines for import of pet coke by involving custom/port agencies to monitor imports and to ensure that all importing companies have the necessary consent from the pollution boards. The custom/port agencies should also be required to send the information to the state boards so that they have information about quantity of pet coke import and its purpose. This information will ensure enforcement.

3. DGFT and BIS should revise their HS codes and standards to reflect the different grades of pet coke so that imports can be better monitored. The HS codes and standards should be in aligned and should differentiate between raw pet coke (fuel grade and anode grade) and calcined pet coke (anode grade and needle).

4. CPCB and state pollution control boards *must improve monitoring of emissions of particulates, SO2 and NOx to ensure that the emissions from the substitute fuel, mostly coal, are kept under control.* It is evident that combustion of coal will also lead to emissions. The only way to control emissions is to either greatly strengthen monitoring and enforcement of these pollutants or to move industry to cleaner fuel, namely natural gas or electricity.

Annexure 1

Summary

28 operating calciners in India. Total capacity of 2.06 million MT of CPC

6 calciners are entirely dependant on imports. Total capacity of ~1.17 million MT. Operating at 85%. Easy to regulate

22 calciners operate on domestic GPC. Capacity of 0.9 million MT. Operating only at 45% due to shortage of domestic GPC

Aluminum industry is primarily dependant on the import based calciners

Total current GPC import requirement is ~1.4 million MT (expansions not considered)

Current expansions could require ~0.7 million MT of additional GPC imports per annum

S.NO	CALCINER	Location	State	GPC source	Capacity	Production	Capacity Utilization	GPC imported
	Imported GPC based							
1	RAIN CII CARBON	Vizag	Andhra Pradesh	Import	5,00,000			
2	SANVIRA INDUSTRIES LTD	Vizag	Andhra Pradesh	Import	2,00,000			
3	GOA CARBON LTD	Bilaspur	Chattisgarh	Import	40,000			
	GOA CARBON LTD	Goa	Goa	Import	1,00,000			
	GOA CARBON LTD	Paradeep	Odissha	Import	1,25,000			
4	KALINGA CALCINERS PVT LTD	Paradeep	Odissha	Import	60,000			
5	INDIA CARBON LTD	Budge Budge	West Bengal	Import	54,000			
6	PETRO CARBON N CHEMICALS PVT LTD	Haldia	West Bengal	Import	93,750			
	Total import based				**11,72,750**	**10,01,283**	**85%**	**13,51,732**
	Domestic GPC based							
7	NEO CARBON	Barauni	Bihar	Domestic	1,51,200			
8	BIHAR CARBON	Barauni	Bihar	Domestic	33,600			
9	KANISHKA CARBON	Barauni	Bihar	Domestic	45,600			
10	MAHABEER	Barauni	Bihar	Domestic	37,200			
11	UNIVERSAL HYDROCARBON	Barauni	Bihar	Domestic	19,200			
12	KRISHNA CARBON	Barauni	Bihar	Domestic	51,600			
13	PREMIER	Barauni	Bihar	Domestic	21,600			
14	CARBON RESOURCES	Barauni	Bihar	Domestic	36,000			
15	GRAPHITE INDIA	Barauni	Bihar	Domestic	54,000			
16	BRAMHAPUTRA CARBON	Bongaigaon	Assam	Domestic	1,00,000			
17	CARBON RESOURCES	Bongaigaon	Assam	Domestic	24,000			

18	NEW AGE PETCOKE	Bongaigaon	Assam	Domestic	24,000		
19	INDIA CARBON LTD	Guwahati	Assam	Domestic	60,000		
20	DIGBOI CARBON	Digboi	Assam	Domestic	24,000		
21	UPPER ASSAM	Digboi	Assam	Domestic	18,000		
22	NUMALIGARH	Numaligarh	Assam	Domestic	75,000		
23	VEDIC PETROCHEMICAL PVT LTD		Gujarat	Domestic	24,000		
24	SEASOME CARBON PVT LTD		Gujarat	Domestic	24,000		
25	REFRATHERM INTERNATIONAL	Nagpur	Maharashtra	Domestic	16,000		
26	RAIPUR MINERALS	Raipur	Chattisgarh	Domestic	15,000		
27	ELECTROMINERAL INDIA PVT LTD	Katni	Madhya Pradesh	Domestic	12,000		
28	AMRITESH	Angul	Odissha	Domestic	24,000		
	Total domestic based				**8,90,000**	**3,96,096**	**45%**

Annexure 2

Aluminium Industry and CP Coke requirement (India) overview:

in MT

Producer	Aluminium Capacity	C P Coke Requirement	FY 18	
			Production	C P Coke requirement
Nalco	5,00,000	2,05,000	50,00,000	2,05,000
Hindalco	13,00,000	5,33,000	12,89,766	5,28,804
Vedanta	17,00,000	6,97,000	11,00,000	4,51,000
Balco	5,00,000	2,05,000	5,00,000	2,05,000
Total	40,00,000	16,40,000	33,89,766	13,89,804

Annexure 3

Use of Petroleum Coke as an additive in metallurgical coke making in Steel Industry

"Hon'ble Supreme Court of India vide its Order dated 26.07.2018 mentioned that the decision on the use of imported pet coke in the **steel industry** and aluminium industry is still under consideration. We are informed by the learned ASG that studies will have to be conducted and BIS standards will have to be fixed in the case of aluminium industry. 7 The entire exercise may take about eight weeks. We accordingly grant time till 1st October, 2018 for a decision to be taken in the matter. List the applications on 09th October, 2018".

In compliance to the Hon'ble Supreme Court direction dated 26.07.2018, a study for assessment of SO_2 emission has been conducted in one steel plant of M/s JSW Vijayanagar Works, located at Toranagallu, Ballari District, Karnataka during 15 to 18th August, 2018.

Coke making Process

The integrated steel manufacturing involves many process operations like sintering, pelletizing, coke making, iron making, steel making etc. Coke making process involves carbonization (destructive distillation) of coal at a temperature of about 1100 °C in an oxygen deficient atmosphere (absence of air or in controlled atmosphere) in order to produce carbonaceous residue known as Coke (concentrate the carbon). This process also liberates fuel gas called Coke oven Gas, as off gases from the volatile matter present in coal. The unit is producing metallurgical coke through two technologies viz. By-product recovery (Recovery Coke Oven) and Heat recovery routes (Non- Recovery Coke Oven).

Findings:

In order to evaluate the impact of use of pet coke which has higher sulphur content than coal, source emission monitoring has been carried out. Based on monitoring data and information provided by the unit, sulphur balance was also estimated. The findings of the study are summarised as under:

1. Coke Making involves carbonisation coal by removal of volatile matter in coal to obtain strong porous coke for use in blast furnaces.
2. The stamp charge technology is adopted for charging of coal into the ovens where higher bulk density of coal blend is achieved due to compaction, as compared with top charging, which helps in producing superior quality of coke.

3. About 5 to 6% of petcoke was used in the blend of coal and petcoke so as to maintain overall sulphur content less than 0.75%. However, industry has earlier used up to a maximum of 10% of petcoke to optimise the blend composition.

4. The pet coke used by M/s JSW Ltd. has low volatile matter (10 -11%), low ash < 0.4% and relatively high sulphur content 2.19%, as compared with imported coal i.e. Volatile matter 18-39%, ash (5 – 12%) and sulphur (0.43 – 1.16%). Due to use of pet coke, the coke produced has low ash content which helps in reduction in slag generation in iron making and improved productivity.

5. The volatile matter is recovered as coke oven gas in case of recovery type coke making, which is used as a fuel gas in steel plant furnaces after recovery of by products and impurities. Whereas, the volatile matter is burnt in the oven to provide heat for carbonisation, in case of non-recovery coke making.

Sulphur balance in coke oven:

i. The sulphur content in coal blend for coke making increased by about 0.1% i.e. from 0.63% to 0.72% by blending 5% pet coke having 2.19% sulphur content.

ii. It is estimated that about 67% of sulphur gets absorbed in coke, 2% carried with Coke Oven Gas and 29% retained as sulphur sludge and 2% in crude tar in recovery type coke ovens whereas in non-recovery type coke ovens about 64% of sulphur is fixed in coke, 19% carried along with waste gases and un-accounted is about 17%. Though, SO_2 emission from non-recovery type coke ovens is about 10 fold higher than recovery type, even though, the concentration of SO_2 was within the emission standards of 800 mg/Nm3 prescribed by Karnataka State Pollution Control Board .

Sulphur balance in Iron Making through Blast furnace and Corex route

i. The unit produces hot metal by the Blast furnace and Corex route. The Blast furnaces uses coke as primary and coal as supplementary material for energy and reduction process. Whereas non-coking coal is used as primary and coke is used as supplementary materials in Corex. The coke to coal ratio in Blast Furnace and Corex process are about 3:1 and 1:4 respectively.

ii. The calorific value of off gas from BF and Corex are 850 Kcal/Nm^3 and 1800 Kcal/Nm^3 respectively, which are used as fuel gas. The Corex gas is utilised in Direct Reduce Iron (DRI) furnace, and Captive Power Plant 1 form power

generation. The Blast furnace gas is utilized in coke oven, blast furnace, captive power plants, steel making etc. with suitable enrichment with other gases. The volume of fuel gas generated from BF is about 8 times higher than Corex gas.

iii. Out of total sulphur inputs to the Blast Furnace, ~92.5% is coming from coke and coal and the remaining of ~7.5% comes from the sinter, pellet, flux and iron ore. In case sulphur output, ~15.5% goes along with Hot metal, ~ 83% as BF slag, ~ 0.7% as dust and only about ~0.7% sulphur is present in the BF gas which is burnt in various furnaces that is emitted as Sulphur dioxide to the atmosphere. In total sulphur input, 98.5% is going along with hot metal and slag.

iv. The emission due to combustion of mixture of gas (fuel gas) in the BF stove let out to the atmosphere through the stack is meeting the prescribed standards of 800 mg/Nm^3 for SO_2.

v. Out of total sulphur inputs to the Corex process, ~97% is coming from coke and coal and the remaining of ~3% comes from the pellet and flux. In case of sulphur output, ~11% goes along with Hot metal, ~ 76% as slag, only ~ 0.04% sulphur is present in the corex gas which is burnt in various furnaces that emitted as Sulphur dioxide to the atmosphere. In total, 87% of sulphur is going along with hot metal and slag.

Conclusions & Recommendations

1. The increase in SO_2 emission due to use of pet coke @ 5% blend with coal in recovery and non-recovery type coke making processes was not substantial as monitored SO_2 emission levels were within the prescribed limits of 800 mg/Nm^3 of SO_2. Similarly, increase in sulphur content. At the same time, the use of pet coke impact in coke ovens and its subsequent increase in sulphur in coke, usage in later stages of steel making viz. iron making and steel making units are insignificant, as most of the sulphur is recovered as slag, tar and sludge (95%).

i. The study shows that the SO_2 emission from Non – recovery coke oven is about 10 fold higher than recovery type, still complying with the emission standards. Frompoint of view of SO_2 emissions, non-recovery technology has higher emissions and needs to be controlled to the applicable emission limit of 800 mg/Nm^3.

ii. Due to the advantages of using pet coke in replacing imported coal, the use of low or high sulphur pet coke in coke ovens may be permitted subject to compliance to the applicable SO_2limits of 800 mg/Nm^3 in clean coke oven gas in case of recovery type coke making. Similarly, the use of low or high sulphur pet coke may be permitted in non-recovery type cokemaking subject to compliance to the applicable limit of 800 mg/Nm^3 in the stack after the waste heat recovery boiler.

iii. The Integrated Iron and Steel sectors are falling under 17 categories of highly polluting industrial sector and the these units are directed to install Online Continuous Emission / Effluent Monitoring Systems (OCEMS) to know the compliance of effluent and emission standards on real time basis. The real time data of OCEMS installed in the stacks are transmitted to CPCB with alert raised in case of exceedances. However, there is need to strengthen the monitoring by installing OCEMS systems in the clean coke oven gas used as a fuel in the steel plant, also for effective monitoring and compliance.

Annexure 4

आलोक चतुर्वेदी
महानिदेशक
Alok Chaturvedi
Director General

May pl see
3.10
Sanitaji

भारत सरकार
वाणिज्य एवम् उद्योग मंत्रालय
विदेश व्यापार महानिदेशालय
उद्योग भवन, नई दिल्ली-110011
Government of India
Ministry of Commerce & Industry
Directorate General of Foreign Trade
Udyog Bhawan, New Delhi - 110011

D.O. No. 01/89/180/22/AM-12/PC-2(A)/[E-1463] /752 **Dated: 27th September, 2018**

Respected Sir,

Please refer to the D.O letter no EPCA -R/2018/L- September 14, 2018 seeking input on the specific WTO Rules that affect the Order of the Hon'ble Supreme Court.

2. In pursuance to the Hon'ble Supreme court's order dated 26/07/2018 (MC Mehta vs UOI WP No. 13029/1985) Central Government has issued Notification No. 25 dated 17th August, 2018 vide which import of Pet Coke for fuel purposes is "prohibited" and its import is "free" for cement, lime kiln, calcium carbide & gasification industries when used as feed stock or in the manufacturing process, on Actual User Condition.

3. India is a founding member of WTO. Under Article XX (General Exception) of GATT, 1994- (GATT being one of the WTO Agreements), a member country can impose restriction on import to protect human, animal or plant life or health reason. But under National Treatment principle {Article 3 of GATT}, there cannot be any discrimination between imported pet coke and domestically produced pet coke. In other words, to be consistent with our WTO commitments, if imported pet coke is prohibited for fuel purpose, domestically produced pet coke also will be subject to same prohibition. Similarly, domestically produced pet coke also will be subject to restricted use only in those sectors where imported pet can be used. That means we have to bring out legislative/ other measure (i) to prohibit domestically produced pet coke to be used for fuel purpose and (ii) restrict use of domestic pet coke only cement, lime kiln, calcium carbide & gasification industries.

4. If we don't bring out this discipline for domestically produced pet coke, our treatment towards imported pet coke will be WTO inconsistent and such treatment will most probably be challenged in the WTO Dispute Settlement Body for the simple reason that it affects the exporting countries' commercial/ economic interests. It may also lead to litigation in the courts within the country.

With regards,

Yours sincerely,

(Alok Chaturvedi)

Dr. Bhure Lal,
Chairman , EPCA
Core VIA 3rd Floor, India Habitat centre,
Lodhi Road,
New Delhi -110003

Annexure 5

No. Q-18011/54/2018-CPA
GOVERNMENT OF INDIA
MINISTRY OF ENVIRONMENT, FOREST & CLIMATE CHANGE
(CP Division)

2nd Floor, Vayu Wing, IPB, Jorbagh Road
New Delhi-110003
Dated: September 10, 2018

OFFICE MEMORANDUM

Subject: W.P.(C) No. 13029 of 1985 in the matter of M.C. Mehta Vs. Union of India & Ors. before the Hon'ble Supreme Court of India -regarding.

GUIDELINES FOR REGULATION AND MONITORING OF IMPORTED PETCOKE IN INDIA

In exercise of the powers conferred by sub-sections (1) and (2) of section 3 of the Environment (Protection) Act, 1986 (29 of 1986), the Central Government hereby issues the following Guidelines for Regulation and Monitoring of Imported Petcoke in India, namely: -

1. Guidelines for Regulation and Monitoring of Imported Petcoke in India: -

As per notification of Director General of Foreign Trade (DGFT) dated 17.8.2018, Import of Petcoke for use as fuel is prohibited. However, import of Petcoke is allowed for the following industries namely, cement, lime kiln, calcium carbide and gasification for use as feedstock or in the manufacturing process only on actual user basis as per the conditions stipulated below:

(1) Petcoke importing industries namely, cement, lime kiln, calcium carbide and gasification shall obtain the consent of and registration with the concerned State Pollution Control Boards (SPCB)/ Pollution Control Committees (PCC).

(2) Consent issued by the concerned SPCB/ PCC shall clearly specify the quantity permitted for import and its use on a per month and per annum basis.

(3) Only registered industrial units with valid consent from SPCBs/PCCs as per clause (1) shall be permitted to directly import pet coke and consignment shall be in the name of user industrial units for their own use only.

(4) Import of pet coke for the purpose of trading shall not be permitted.

(5) Authorised importers of Petcoke shall furnish opening and closing stock of imported Petcoke to the concerned SPCB/ PCC on a quarterly basis.

(6) The SPCBs/ PCCs shall develop an electronic record system for uploading of consents, registration and record of use of imported Petcoke by industrial units, as mentioned above and the said Boards/ Committees shall share this data with the Central Pollution Control Board on a quarterly basis. This data shall be published on the Central Pollution Control Board website on receipt from the SPCB/ PCC.

These Guidelines shall come into force from the date of publication of Office Memorandum by Ministry of Environment, Forest and Climate Change.

2. This issues with the approval of Competent Authority.

ch. Murali krishna
(Dr. Murali Krishna)
Scientist 'D'/ Joint Director
E-mail: cm.krishna@gov.in
Tel: 011-24695414

To

(1) Chairman
Central Pollution Control Board
Parivesh Bhawan, East Arjun Nagar
Delhi-110032

(2) Member Secretary
Central Pollution Control Board
Parivesh Bhawan, East Arjun Nagar
Delhi-110032

-for circulating to SPCBs/PCCs.

CC

DS (IT)- for uploading the Guidelines at the Website of Ministry of Environment, Forest and Climate Change.

Annexure 6

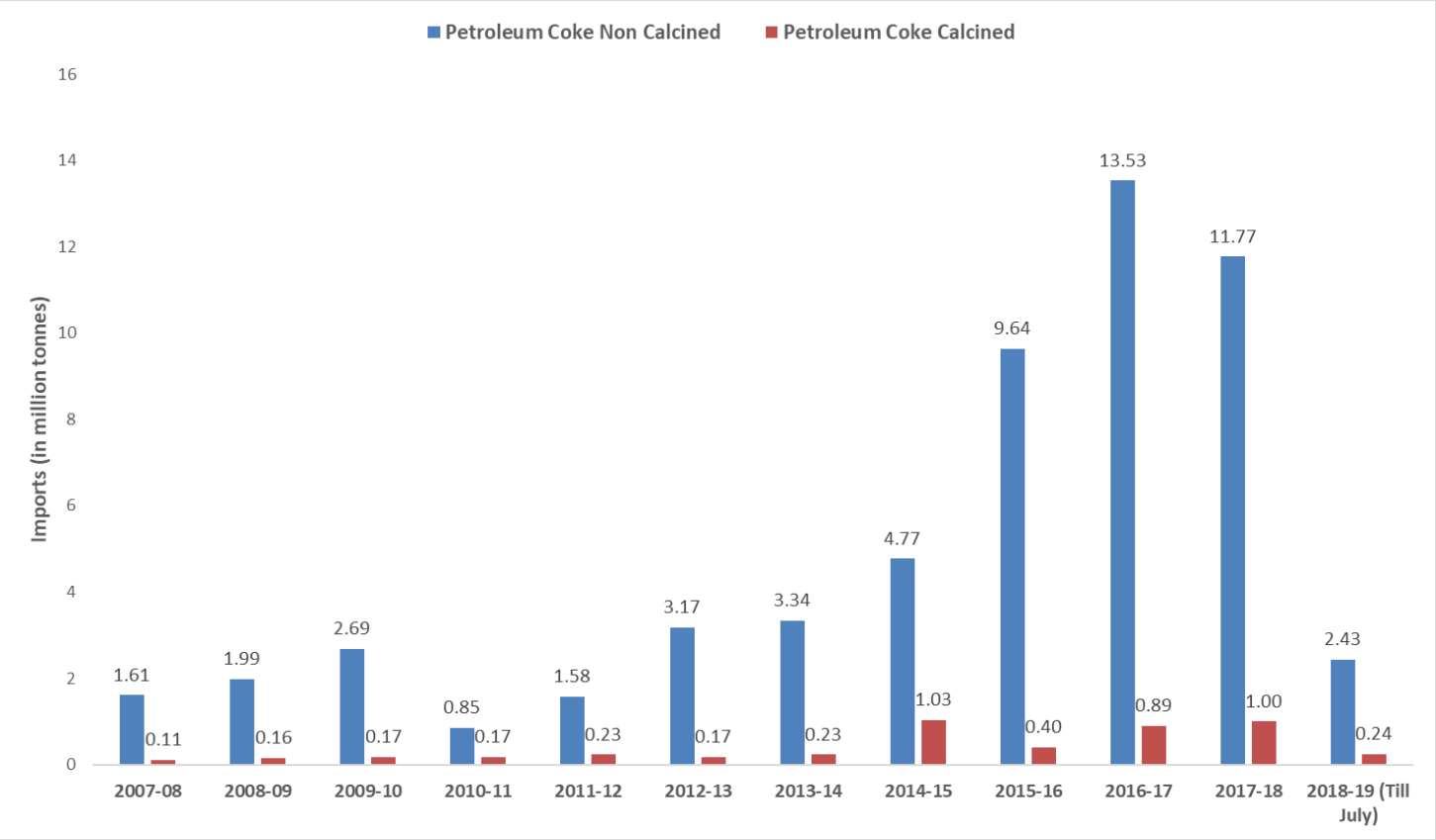
Petroleum Coke Import Trends –

Table 1: Annual Import trends of Petroleum Coke into India, 2007-2019 (in million tonnes)

Import Trends (in million tonnes)	2007-08	2008-09	2009-10	2010-11	2011-12	2012-13	2013-14	2014-15	2015-16	2016-17	2017-18	2018-19 (Till July)
Non-Calcined	1.61	1.99	2.69	0.85	1.58	3.17	3.34	4.77	9.64	13.53	11.77	2.43
Calcined	0.11	0.16	0.17	0.17	0.23	0.17	0.23	1.03	0.40	0.89	1.00	0.24
Total Petroleum Coke	1.72	2.15	2.87	1.02	1.81	3.34	3.57	5.81	10.04	14.37	12.78	2.67

Source: EXIM database, Ministry of Commerce & Industry

Graph: Import trends of Calcined & Non-Calcined Petroleum Coke into India, 2007-2019 (in million tonnes)



Source: EXIM database, Ministry of Commerce & Industry

Annexure 7

Installed production capacity for cement: 332 mnt

Of which we have got the details

Actual production figures for cement from above plants 223 mnt

Installed production capacity for clinker of above plants 237 mnt

Actual production figures for clinker 168 mn t

Out of the above 223 mnt cement production, a capcity of 22mnt did not use petcoke

Actual petcoke consumption from above plants 10.6 mn tonnes

CMA: Information requied by EPCA 2017-18

as on October 5, 2018

S no	CMA Member Companies	Capacity		Production		Pet Coke Consumed
		Clinker	Cement	Clinker	Cement	
		(Million Tonnes)				
1	Binani Cement-Line 1 + Line 2	4.800	4.850	1.690	1.727	0.000
2	Birla Corporation Limited , MP Birla Group	6.400	9.800	5.100	8.020	0.273
3	Reliance Cement Corporation Pvt Ltd MP Birla Group	3.300	5.580	2.950	4.510	0.125
4	Century Cement	1.670	2.400	1.480	1.970	0.098
	Maihar Cement	3.000	4.200	2.950	3.360	0.130
	Manikgarh Cement	4.500	6.000	2.951	3.050	
5	Emami Cement Ltd	3.200	2.500	2.130	1.920	0.134
6	India Cements Ltd-Chennai	11.090	15.550	8.010	11.120	0.665
7	J K Cement Ltd Nimbahera	2.800	3.250	2.040	2.364	0.165
	J K Cement - Muddapur	2.200	3.500	1.554	1.904	0.130
	J K Cement - Mangrol	2.900	2.750	2.418	2.224	0.170
	J K Cement - Jharli (Grinding Unit)		1.800		1.315	
	J K Cement-Gotan	0.263	0.472	0.150	0.078	0.193
	J K White Cement Works-Gotan	0.600	0.618	0.394	0.556	0.041
8	J K Lakshmi Cement Ltd- Sirohi	4.785	4.635	4.978	2.949	0.349
	J K Lakshmi Cement Ltd- Durg	1.500	3.200	1.492	2.120	0.097
9	J S W Cement			1.066	1.479	0.057
10	The KCP Ltd Unit-II	1.550	1.860	1.330	1.520	0.028
11	Kesoram Industries Limited, Cement Division Unit: Kesoram Cements	1.200	1.750	0.690	0.980	Nil
	Kesoram Industries Limited, Cement Division Unit: Vasavadatta Cements	5.366	5.750	3.587	4.365	0.044
12	Malabar Cements Ltd	0.400	0.660	0.370	0.406	0.021
13	Mangalam Cement Ltd	2.310	4.000	2.060	2.440	0.154
14	Saurashtra Cement	1.500	3.060	1.230	1.400	0.123
15	Gujarat Sidhee Cement	1.200	1.400	1.294	1.219	0.058
16	My Home Industries Private Ltd-Mellacheruvu Village	3.043	3.300	2.770	2.210	0.012
	Shree Jayajothi Cement Pvt Ltd-Yanakandla village	2.200	3.200	1.461	1.796	0.008
17	Nuvoco Vistas Corp Ltd					
	Nuvoco-Arasmeta	1.660	1.800	1.550	1.720	0.050
	Nuvoco-Sonadih	3.000	0.550	2.600	0.540	0.100
	Nuvoco-Chittaurgarh	1.590	2.100	1.720	1.900	0.140
	Nuvoco-Jojobera		4.550		4.550	
	Nuvoco-Mejia		1.400		1.480	
	Nuvoco-Bhiwani		0.500		0.470	
18	Orient cement-Devapur	3.500	3.000	2.840	2.600	0.593
	Orient cement- Chittapur	2.000	3.000	1.509	1.824	0.115
19	Prism Johnson Limited-Unit I	2.300	3.000	1.860	1.940	0.100
	Prism Johnson Limited-Unit II	3.000	4.500	2.150	2.810	0.111
20	Sanghi Industries	3.500	4.000	2.200	2.400	0.000

CMA: Information requied by EPCA 2017-18

as on October 5, 2018

S no	CMA Member Companies	Capacity		Production		Pet Coke Consumed
		Clinker	Cement	Clinker	Cement	
		(Million Tonnes)				
21	Shree Cement Ltd	25.870	48.850	15.130	22.200	1.341
22	Shree Digvijay Cement Co. Ltd	1.000	1.200	0.800	0.960	0.070
23	Shriram Cement Works	0.343	0.438	0.275	0.438	0.015
24	Bagalkot Cement & Industries Ltd	0.330	0.545	0.168	0.254	0.004
25	Deccan Cements	1.700	1.800	1.247	1.466	0.000
26	Parasakti Cement Industries Limited	1.440	1.440	0.845	0.955	0.000
27	Dalmia Cement (Bharat) Ltd	20.000	39.000	10.500	16.250	0.750
28	UltraTech Cement	75.700	96.500	45.990	57.660	3.250
29	Sagar Cement (R)Ltd	0.825	0.990	0.628	0.705	0.021
	Sagar Cement Ltd	2.790	3.300	1.650	1.940	0.116
30	Mawmluh Cherra Cements Ltd	0.219	0.252	0.040	0.043	
31	Rain Cements Ltd. Unit-1	1.000		5,53	8.020	
	Rain Cements Ltd. Unit-2	2.600		9.930	13.220	0.420
32	Star Cement Ltd	0.792	0.990	0.515	0.424	
	Star Cement Ltd (Megha)	1.750		1.541		0.0075
33	Heidelberg Cement	3.600	5.270	2.740	4.610	0.170
34	Zuari Cement Ltd	5.000	7.200	3.370	4.190	0.120
	Total:	**237.286**	**332.260**	**167.942**	**222.572**	**10.567**
CMA Non Members - estimated data						
35	ACC Ltd		32.000	17.340	26.560	1.172
36	Ambuja Cements Ltd		29.650	17.440	22.000	1.064
	Total:	**237.286**	**393.910**	**202.722**	**271.132**	**12.802**

Response awaited from the following Member Companies

S no	CMA Memer Companies	Installed Capacity Mn.T
1	Cement Corporation of India Ltd	3.90
2	Chettinad Cement Corporation Ltd	12.00
3	Anjani Portland Cement Ltd	1.16
4	Jaiprakash Associates Ltd	11.75
5	Penna Cement Industries Ltd	7.00
6	The Ramco Cements Ltd	16.69
7	Tamil Nadu Cements Corporation Ltd	0.79
8	Jammu & Kashmir Cements Ltd	0.20
9	Panyam Cements & Minerals Industrie	0.53
10	Meghalaya Cement Ltd	0.86
11	Khyber Industries (P) Ltd	0.33
12	Hi-Bond Cement (I) Private Ltd	1.32
	Total	**56.53**

Annexure 8

Petcoke sales to Cement Industry

Provided to EPCA by Centre for High Technology

(Figures in Million Metric Tonnes|)

	2017-18		April - August 2018	
	Total Sales	**Direct Sales to Cement Industry**	**Total sales**	**Direct sales to Cement Indsutry**
IOCL	3.166	47%	1.256	52%
CPCL	0.06	0%	0.157	10%
BPCL/BORL	1.045	90%	0.508	95%
NRL	0.095	0%	0.014	0%
HMEL	0.872	51%	0.427	56%
MRPL	0.81	93%	0.368	100%
RIL	4.8	68%	2.73	81%
NEL	2.217	43%	0.966	61%
Total	**13.065**	**60%**	**6.426**	**71%**