

***India Carbon Black Industry in 2020
&
Review of IMO 2020 impact on
Carbon Black Feedstock***

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Topics

- **India Carbon Black Industry**
 - ✓ Current view
 - ✓ 2025 forecast
 - ✓ Industry players
 - ✓ Supply and Demand Balance
- **IMO 2020 Impact on Carbon Black Feedstock**
 - ✓ Residual fuel market review
 - ✓ World bunker fuel review
 - ✓ What happened in 2020
 - ✓ Impact on decant oils

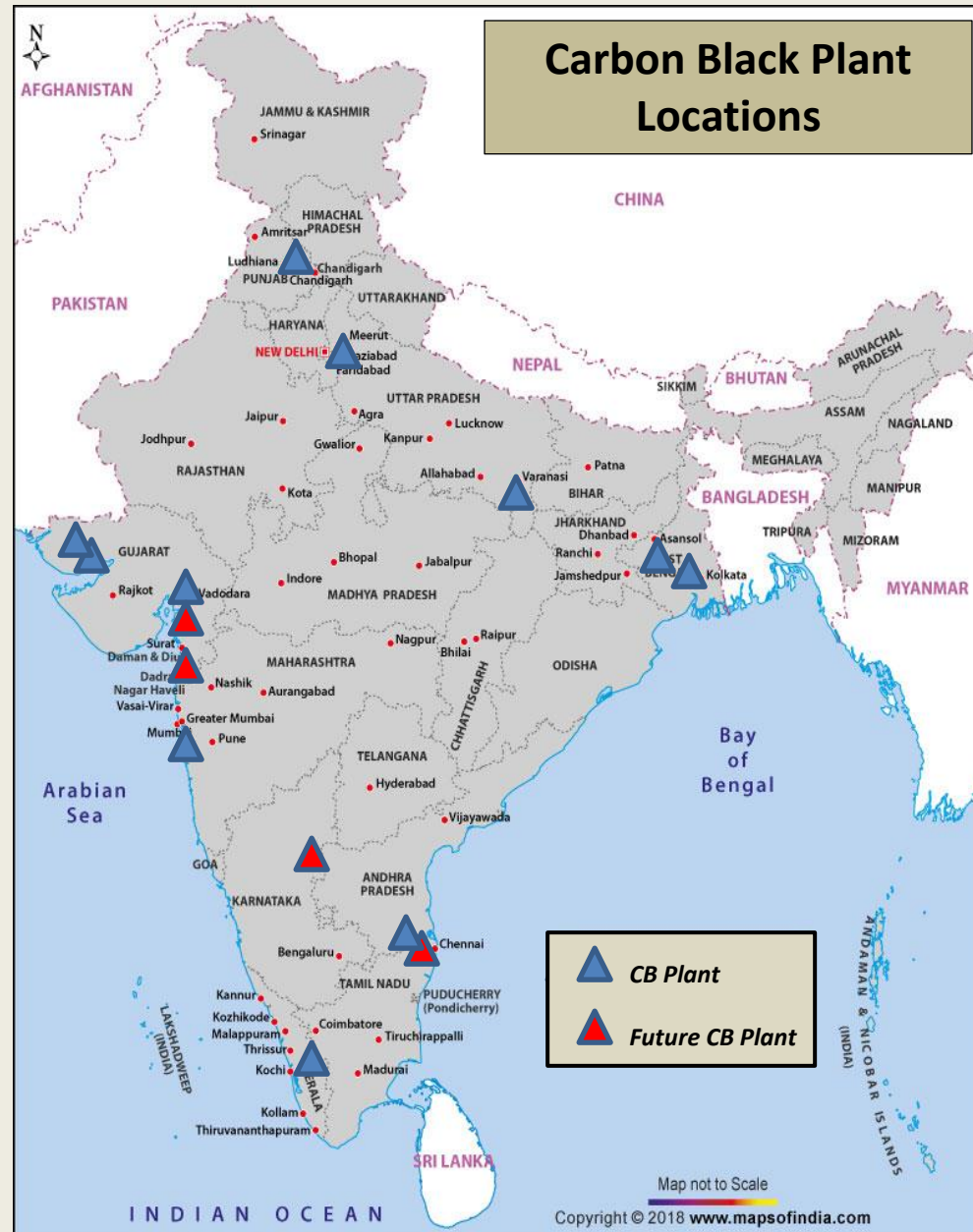
India Carbon Black Industry View

Year	2015	2019	2020	2021	2025
Industry Capacity, KTPY	1031	1176	1316	1503	2054

➤ **Indian Carbon Black industry capacity doubles from 2015 to 2025.**

- **2015: 5 companies, 10 plants and 1,031 KTPY**
- **2020: 6 companies, 11 plants and 1,316 KTPY**
- **2021: 7 companies, 12 plants and 1,503 KTPY**
- **2025: 8 companies, 14 plants and 2,054 KTPY**

➤ **Two new CB plant investments in Gujarat, plus one new plant in Chennai and another in Karnataka.**



India Carbon Black Industry View

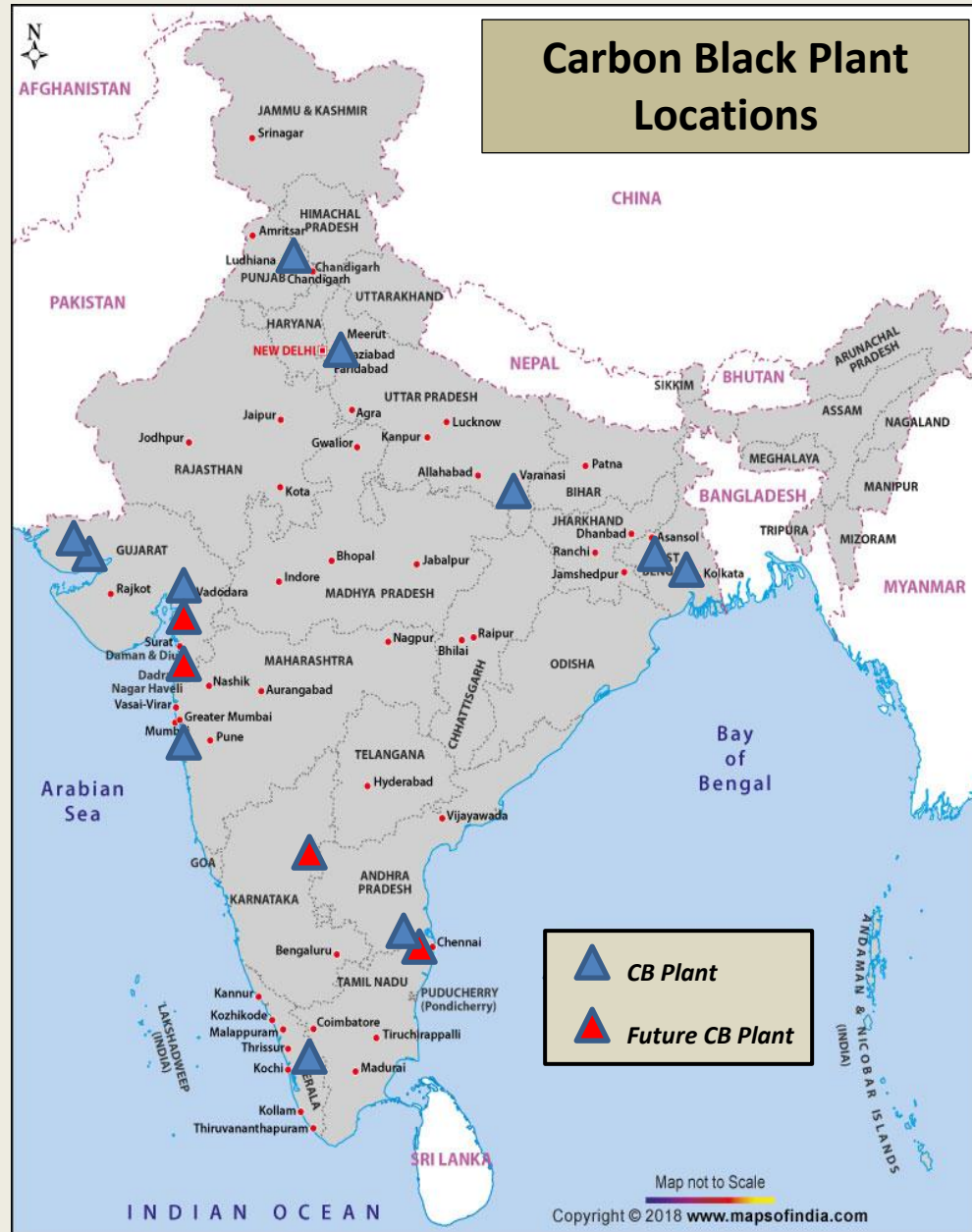
- **Key market for U.S. Carbon Black Feedstock:**
 - **In 2019, 49% of exported U.S. CBO was shipped to India (994 KT). Buyers included:**
 - PCBL: 540 KT**
 - Birla Carbon India: 454 KT**

- **History of U.S. CBO Exports to India:**

Year	2015	2016	2017	2018	2019	2020
KT	797	996	1183	1096	994	484*

*Jan – June 2020

- **In 2020, total volume of U.S. CBO to India might be about the same, even though there were no shipments from mid-April until end-June due to COVID-19.**

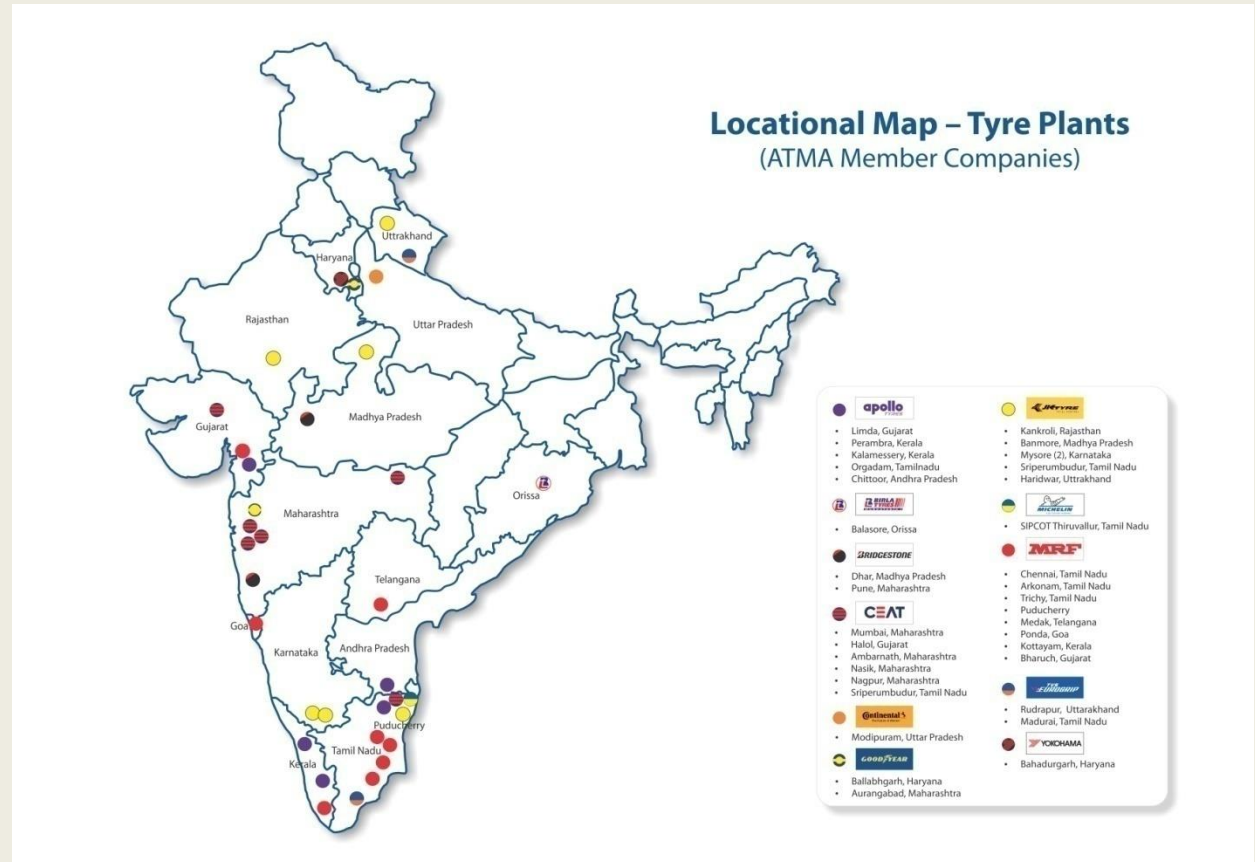


India's Tire Manufacturing Industry

➤ The Indian Tire Manufacturing Industry capacity expanded 31% from 2015 to 2019.

➤ The country has 41 tire companies in 66 tire manufacturing plants.

➤ A number of tire manufacturing plants are concentrated on the west coast in Gujarat and Maharashtra. As well, in southern India in Kerala, Karnataka and Tamil Nadu.



Source: Automotive Tyre Manufacturers' Association, New Delhi, India
Representing 90% of Indian tire production.

Phillips Carbon Black Ltd.

Plant Locations	2015	2019	2020	2021	2025
Durgapur, West Bengal	152	152	152	152	152
Kochi, Kerala	90	90	90	90	90
Palej, Gujarat	90	125	125	125	125
Mundra, Gujarat	140	190	190	190	190
Chennai, Tamil Nadu					150

2015 capacity: **472 KTPY**

2020 capacity: **557 KTPY (+18%)**

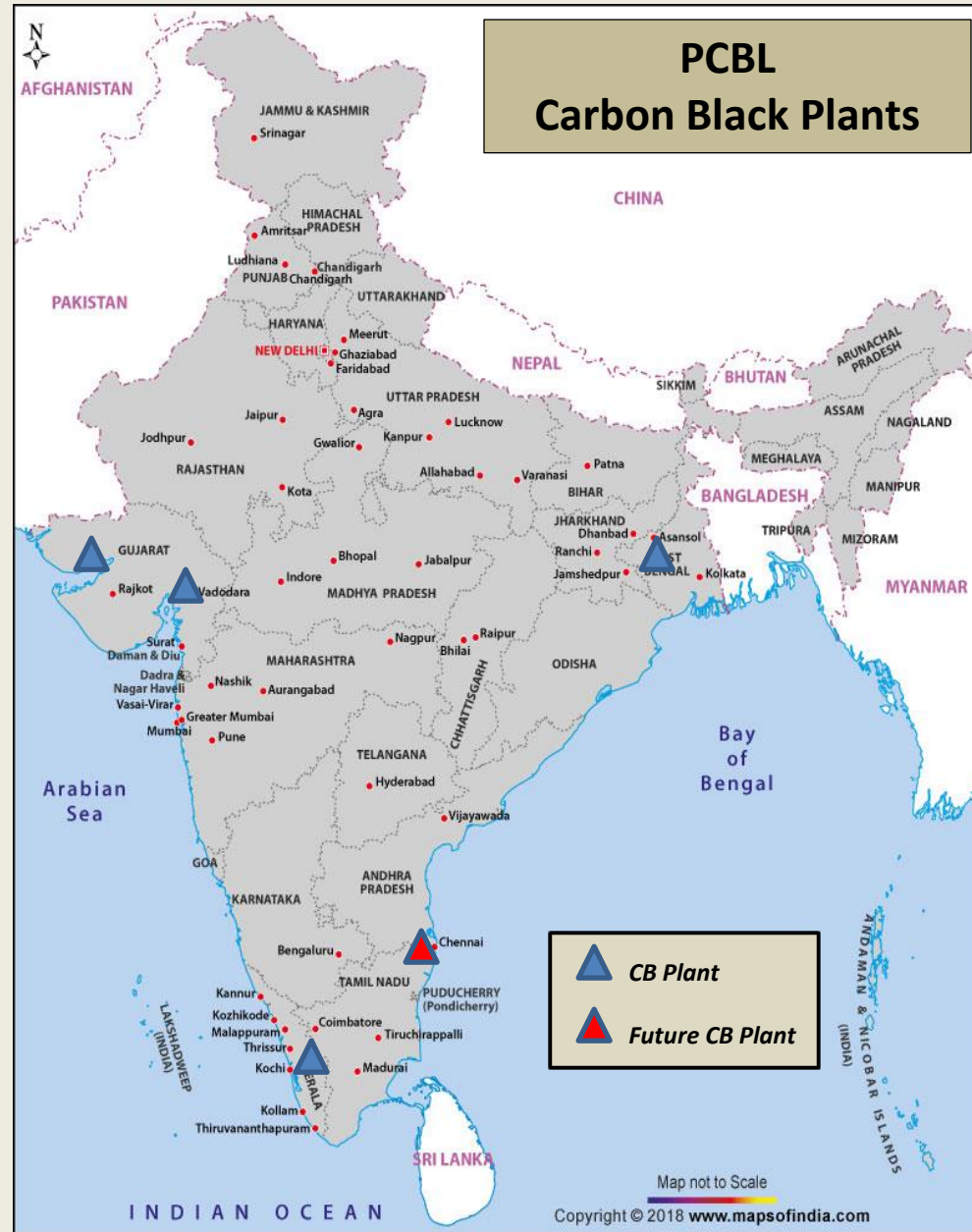
2025 capacity: **707 KTPY (forecast) (+27%)**

CB Production Capacity Expansion:

+50 KTPY Mundra (2018)

+30 KTPY Palej (2019)

+150 KTPY Chennai (2025)



Birla Carbon India

Plant Locations	2015	2019	2020	2121	2025
Renukoot, Uttar Pradesh	80	80	80	80	80
Gummidipoondi, Tamil Nadu	150	150	150	222	222
Patalganga, Maharashtra	84	84	84	84	120

2015 capacity: **314 KTPY**

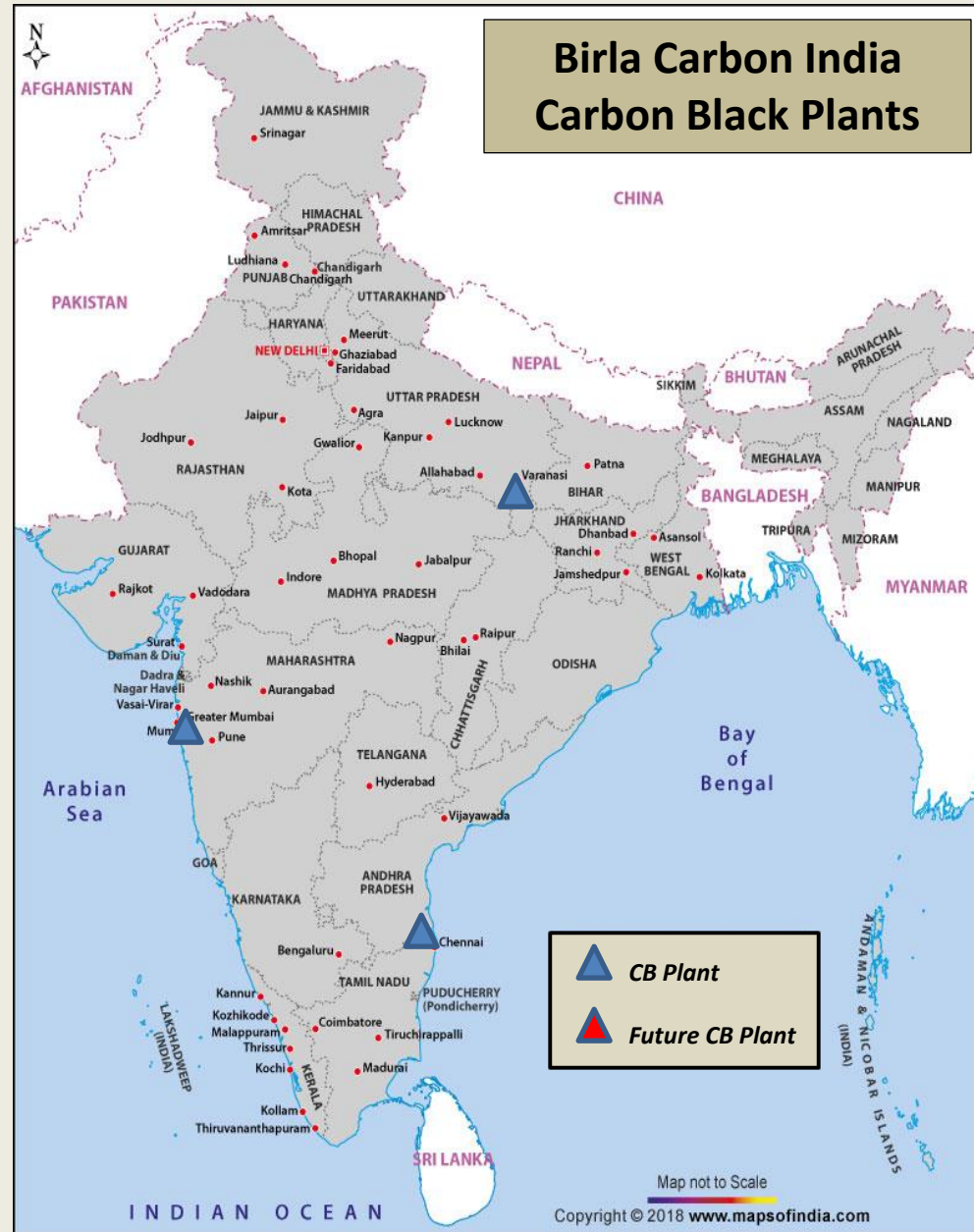
2020 capacity: **314 KTPY**

2025 capacity: **422 KTPY (forecast)(+35%)**

CB Production Capacity Expansion:

+72 KTPY Gummidipoondi (2021)

+36 KTPY Patalganga (future)



Himadri Specialty Chemical

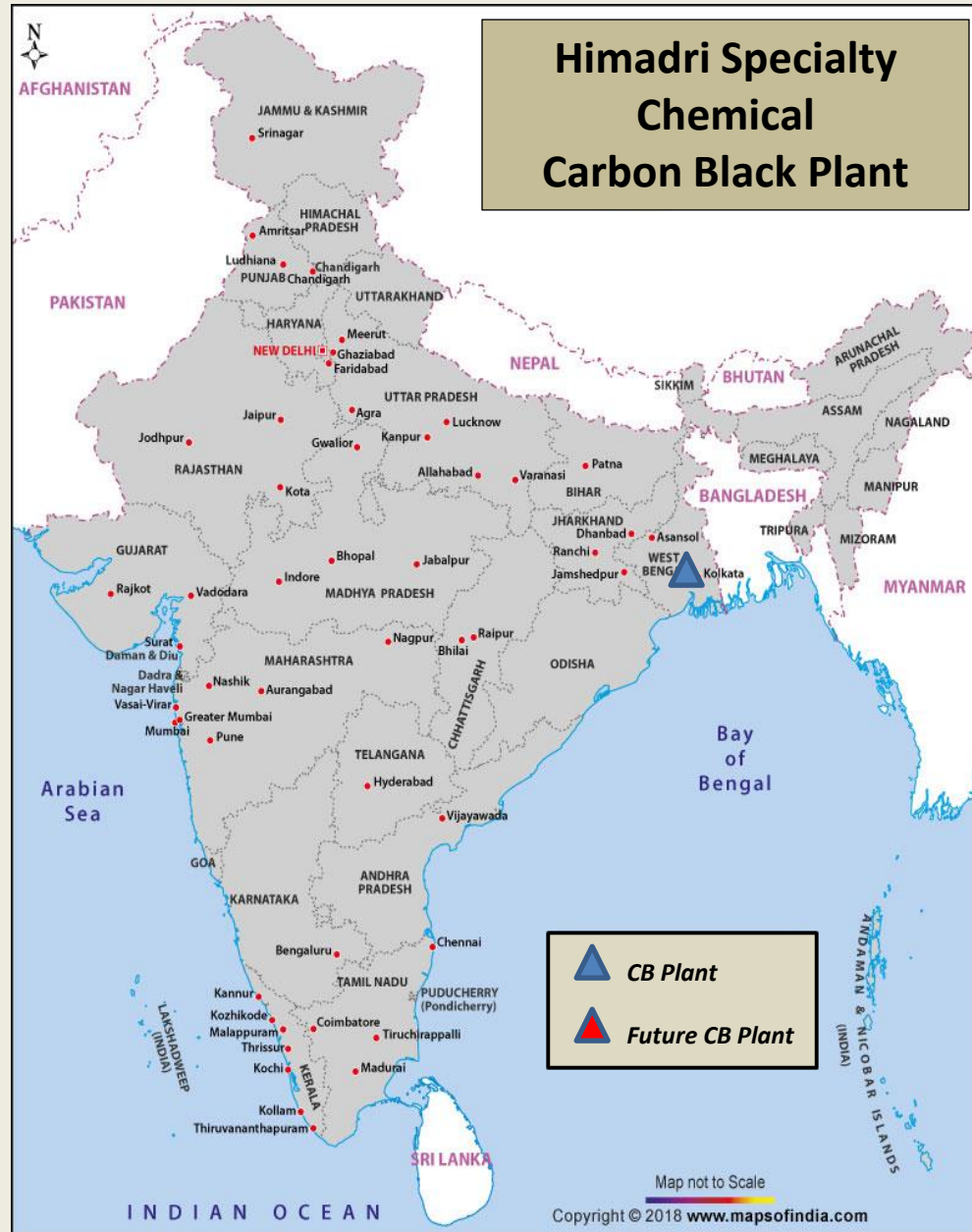
Plant Location	2015	2019	2020	2021	2025
Mahistikry, Hooghly, West Bengal	120	120	180	180	180

2015 capacity: **120 KTPY**

2020 capacity: **180 KTPY (+50%)**

2025 capacity: **180 KTPY (forecast)**

CB Production Capacity Expansion:
+60 KTPY Mahistikry



Balkrishna Industries (BKT)

Plant Location	2015	2019	2020	2021	2025
Padhar, Bhuj, Gujarat	-	60	140	140	140

2019 capacity: **60 KTPY**

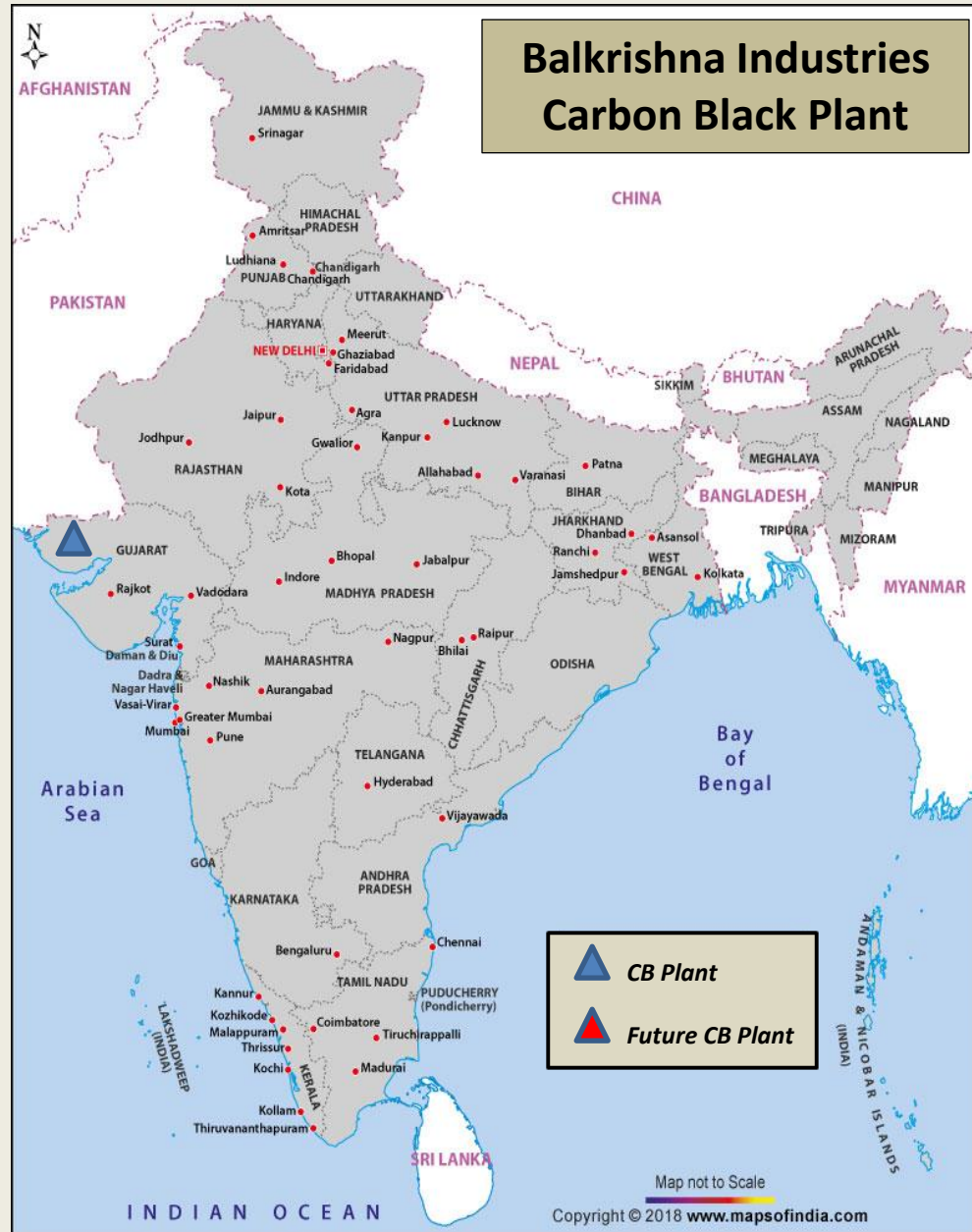
2020 capacity: **140 KTPY**

2025 capacity: **140 KTPY (forecast)**

CB Production Capacity Expansion:

+60 KTPY (2019)

+80 KTPY (2020)



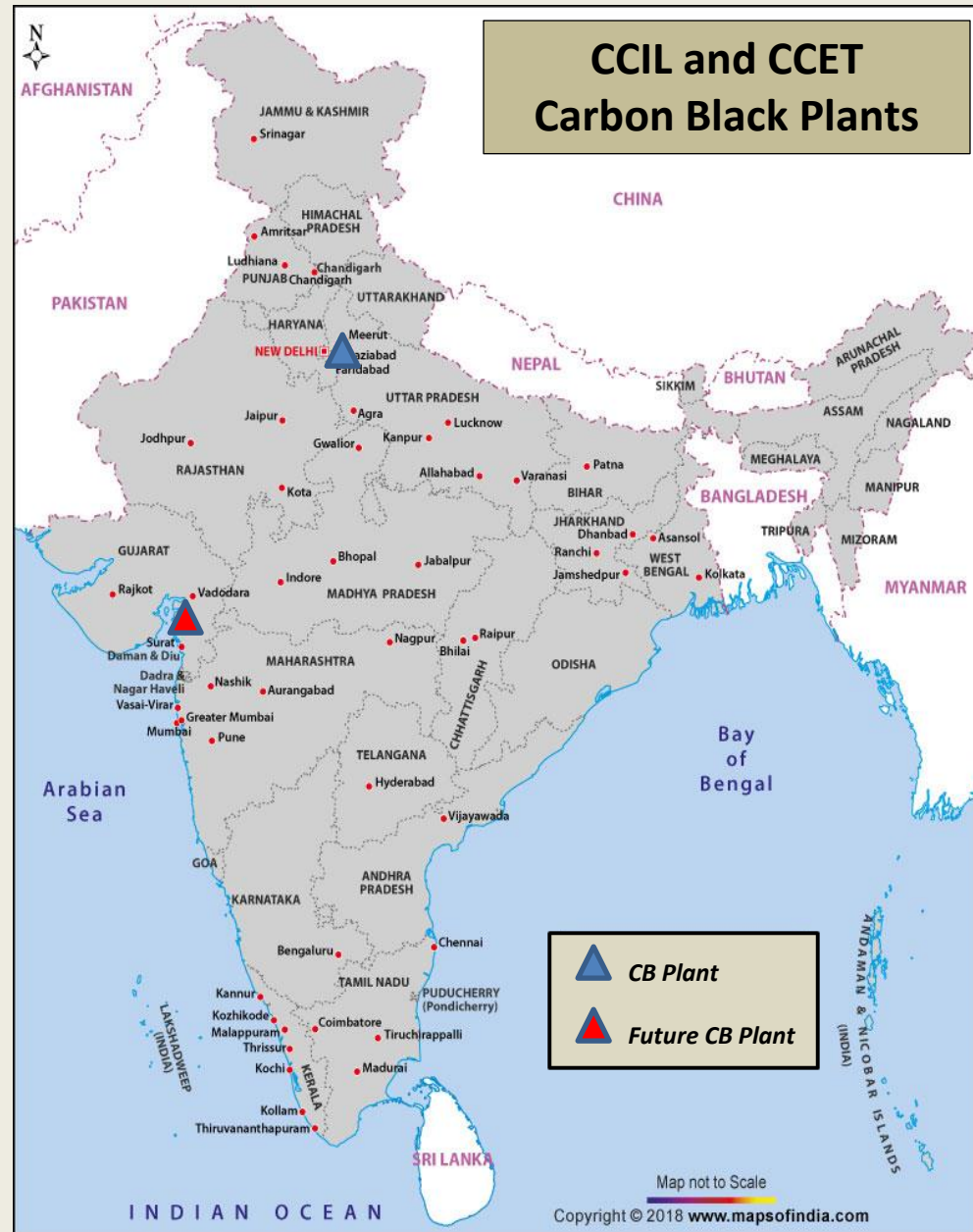
Continental Carbon India Ltd. (CCIL) Continental Carbon Eco. Tech (CCET)

Plant locations	2015	2019	2020	2021	2025
CCIL - Ghaziabad, Uttar Pradesh	85	85	85	85	0
CCET – Galenda, Gujarat	-	-	-	-	150

CCIL:
 2015 capacity: **85 KTPY**
 2020 capacity: **85 KTPY**
 2025 capacity: **0 KTPY** (forecast)

CCET:
 2025 capacity: **150 KTPY** (forecast)

Note:
The CCET investment is for constructing a 150 KTPY carbon black plant and 16 MW power generation unit.



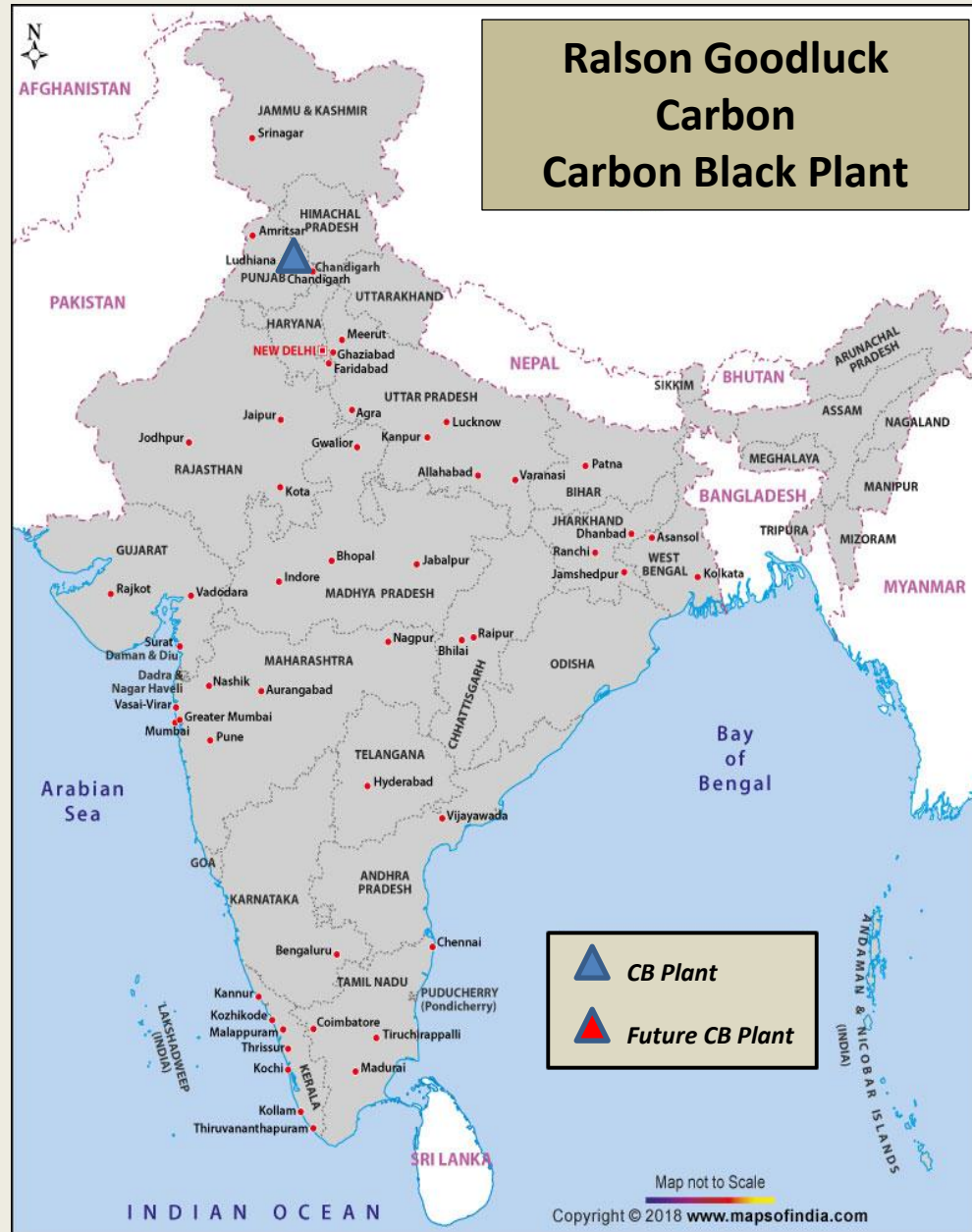
Ralson Goodluck Carbon

Plant Location	2015	2019	2020	2021	2025
Malerkotla, Punjab	40	40	40	40	40

2015 capacity: **40 KTPY**

2020 capacity: **40 KTPY**

2025 capacity: **40 KTPY** (forecast)



Epsilon Carbon

Plant Location	2015	2019	2020	2021	2025
Ballari, Karnataka	-	-	-	115	300

2021 capacity: **115 KTPY**

2025 capacity: **300 KTPY** (forecast)

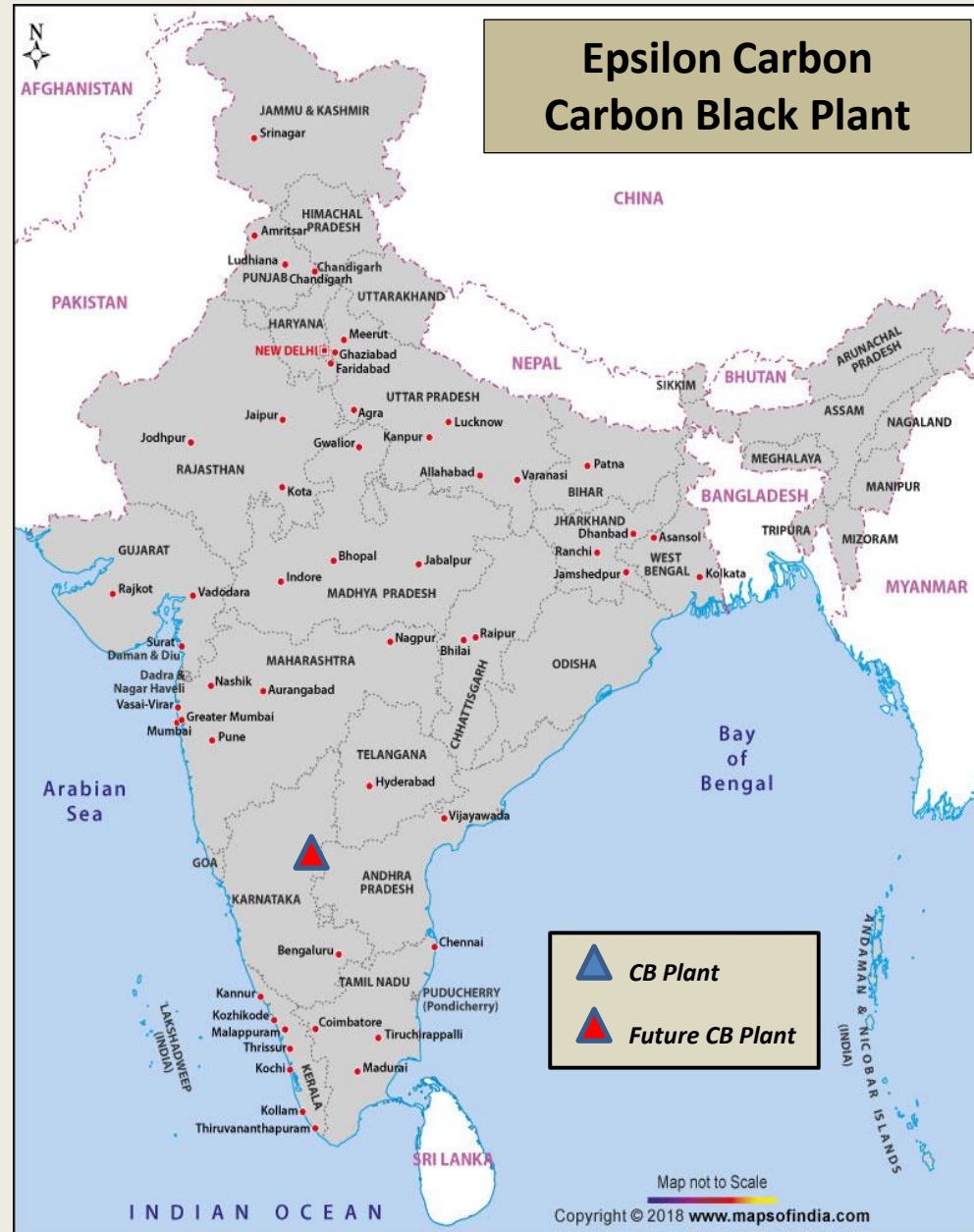
CB Production Capacity Expansion:

+115 KTPY (2021 – phase 1)

+185 KTPY (phases 2 and 3)

CB Feedstock:

Epsilon’s 220 KTPY coal tar distillation plant will supply coal tar in addition to coke oven fuel gas from JSW Steel.

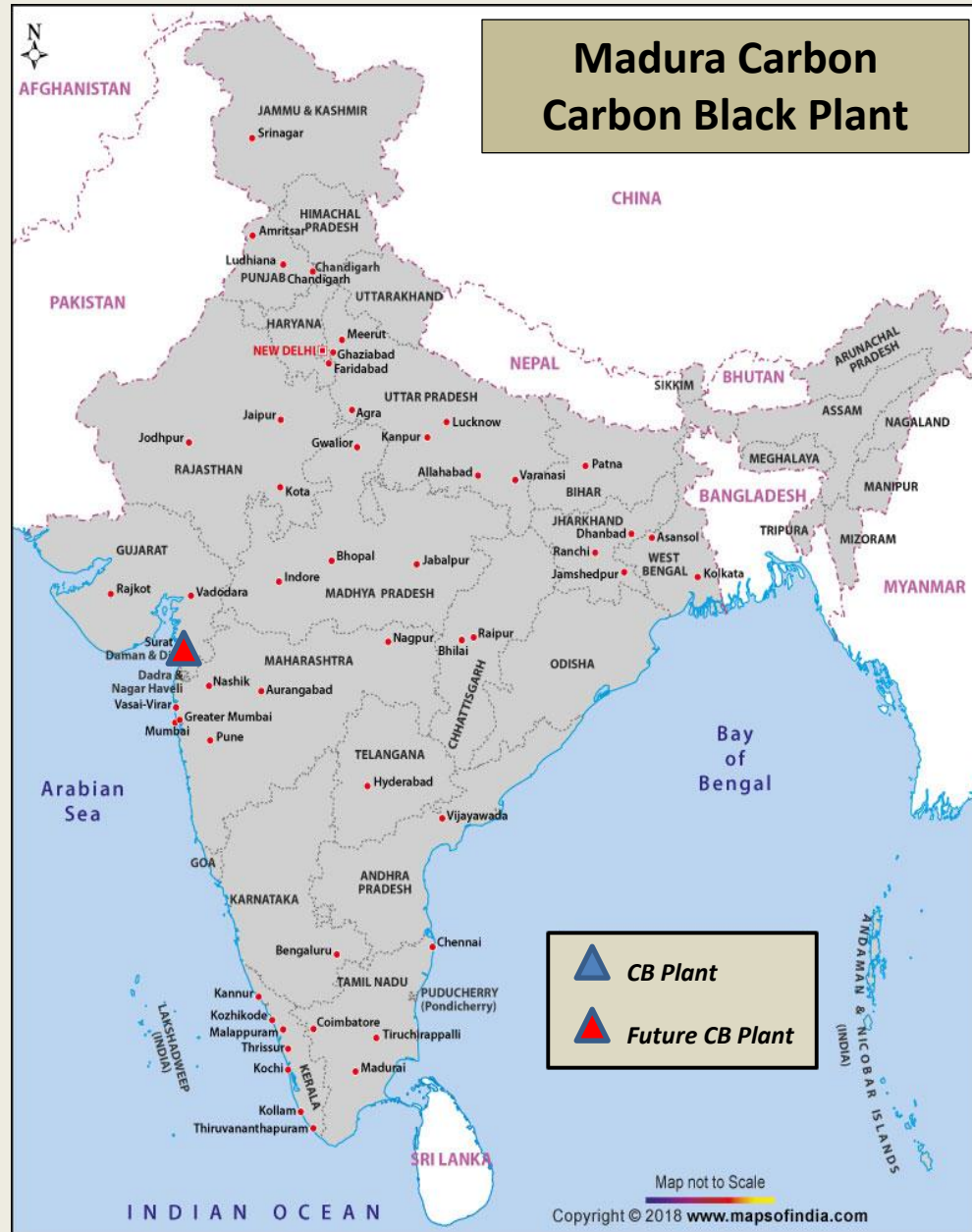


Madura Carbon

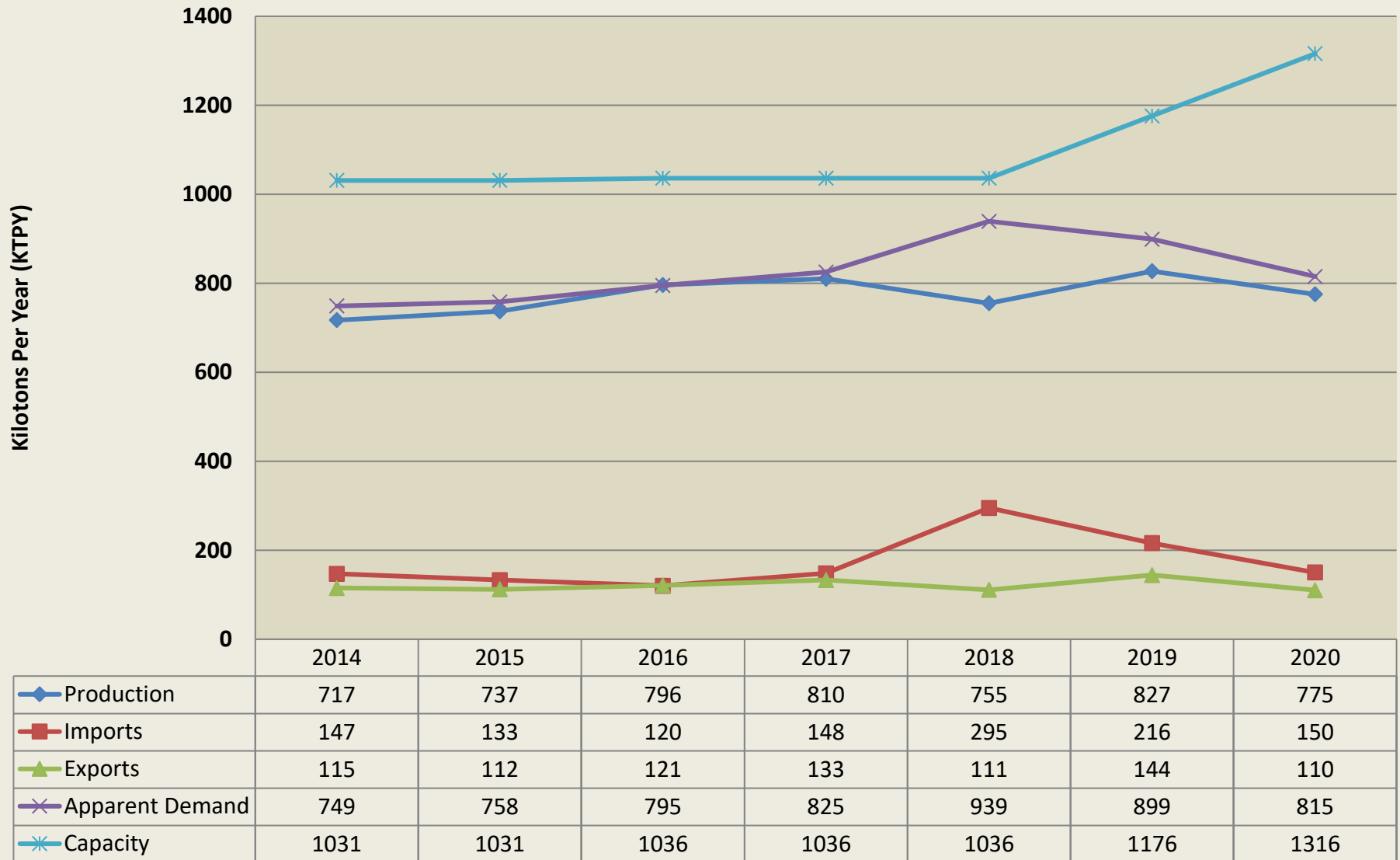
Plant Location	2015	2019	2020	2021	2025
Fansa, Valsad, Gujarat	-	-	-	-	230

2025 capacity: **230 KTPY** (forecast)

Note:
The Madura investment is for constructing a 230 KTPY carbon black plant and 45 MW power generation unit.



Carbon Black Supply/Demand Balance 2014 – 2020



Supply/Demand Balance

- From 2014 – 2019, the average plant utilization rate for the industry was 70 – 80%. This rate dropped below 60% in 2020 due to COVID-19.
- In 2019, carbon black imports dropped 27% from 295 KT(2018) to 216 KT. Largest import volumes were from China (82 KT) and Korea (60 KT).
- In 2019, carbon black exports were up 29% to 144 KT, with Sri Lanka (26 KT) and Vietnam (22 KT) the leading importing countries.

India Carbon Black Industry Overview

- Capacity will double from 2015 to 2025 to 2,054 KTPY.
- India remains the primary market for U.S. CBO exports.
- 2020 CB output and CBO demand declined due to COVID-19.
- The industry is operating at 62% utilization in 2020, down from the typical 70 – 80%.
- Tire manufacturers expanded 31% 2015 – 2019. Growing demand will encourage more CB capacity growth.
- More CB production investments are expected during the next 5 – 10 years, primarily in western and southern states.

Post IMO 2020 – Residual Market Review

- International Maritime Organization Jan. 1, 2020 mandate:

Required global bunker fuel sulfur limit to decrease from 3.5% to 0.5%

- Ship owner options:

- Burn VLS distillates, resids, LNG, LPG, etc.
- Use HS resid but scrub SO_x from ship exhaust gas
- Slow steaming to reduce bunker consumption
- Obtain waiver or just ignore IMO mandate
- Increase freight rates (bunker surcharges) due to higher fuel costs

- Refinery options:

- Introduce 0.5% resid bunker fuels while reducing HSFO supplies, destroy surplus HS resid
- Sell VLS FCC gas oil feedstock into marine fuel market
- Segregating available LS and VLS resid blend stocks
- Increasing coking, hydrocracking and resid desulfization

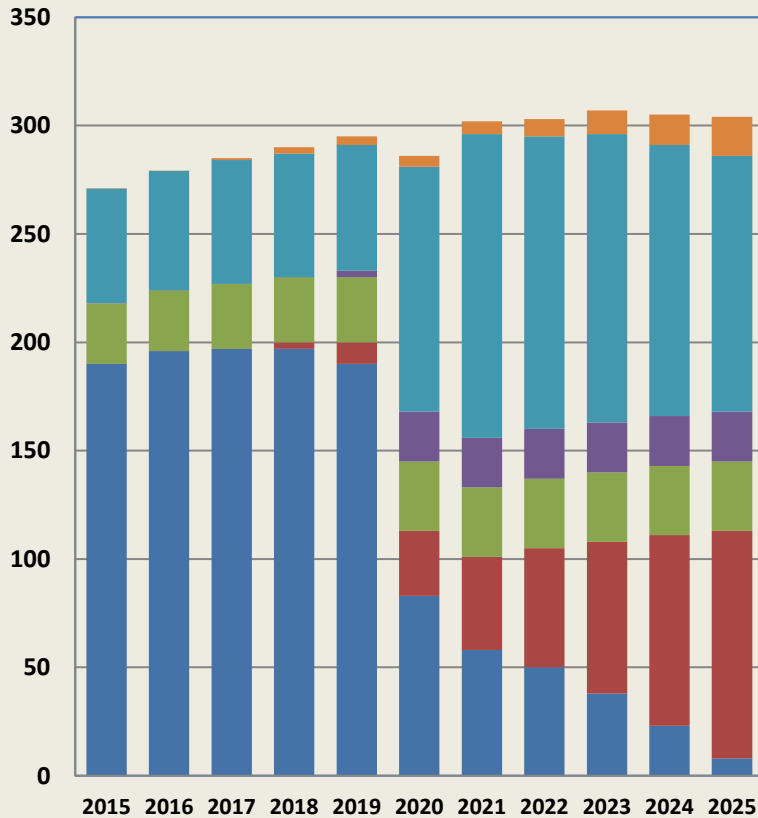
- HSFO/Carbon Black Oil nomenclature:

- Ultra Low Sulfur (ULSFO) 0.0 – 0.1 % Sulfur
- **Very Low Sulfur (VLSFO) 0.1 – 0.5**
- Low Sulfur (LSFO) 0.5 – 1.5
- Medium Sulfur (MSFO) 1.5 – 2.5
- **High Sulfur (HSFO) 2.5 – 4.0**

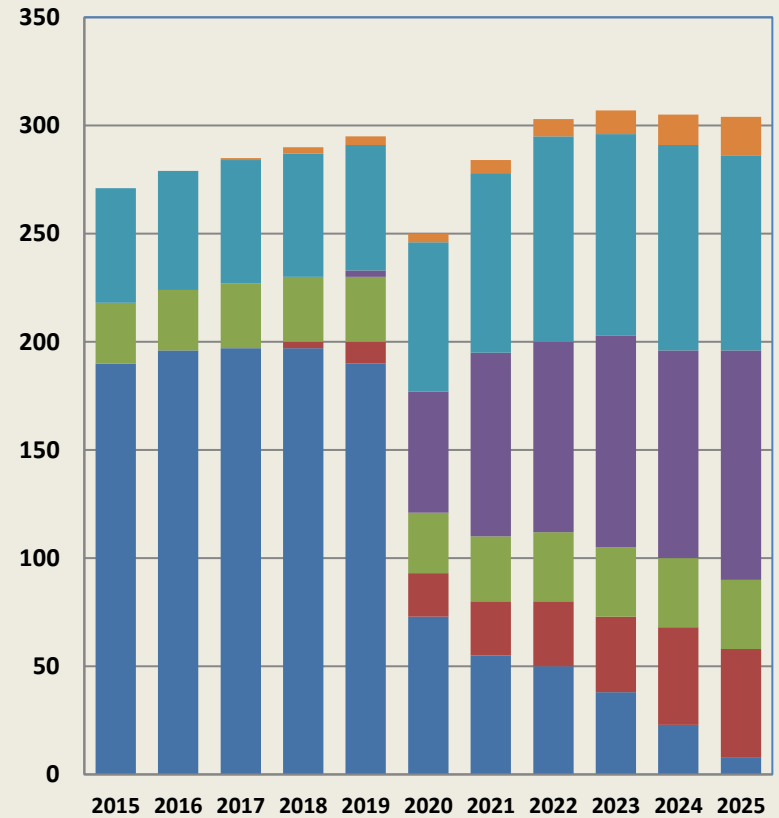
World Bunker Fuel Types

History & Forecast (Million tons/year)

2019 Estimate



2020 Estimate



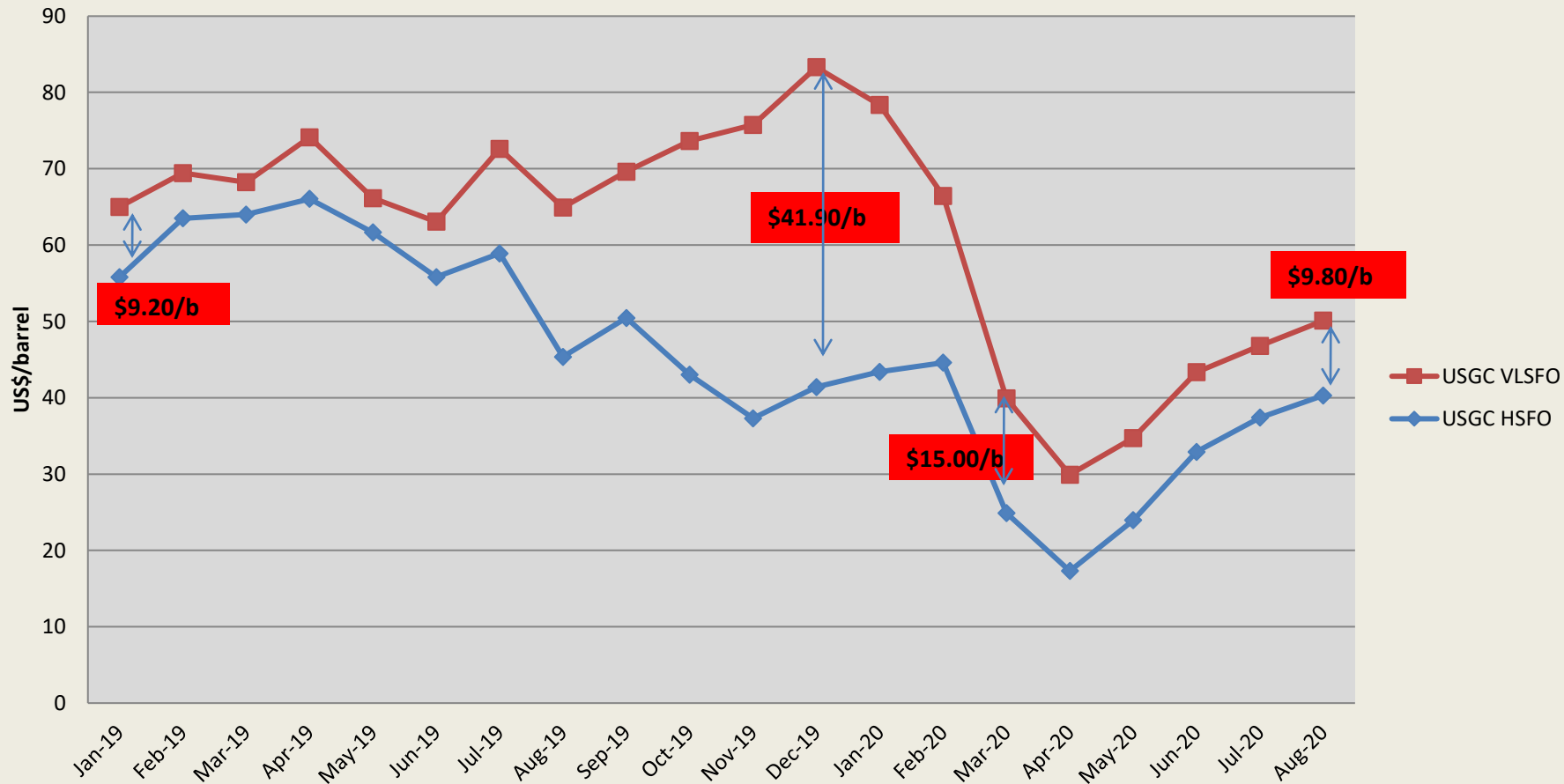
■ Marine Diesel 0.5% S ■ VLSFO ■ Marine Diesel 0.1% S ■ LNG ■ Scrubbed HSFO ■ Unscrubbed HSFO

Post IMO 2020 – Oil Market Review

- In 2019, the forecast was high value for VLSFO and lower value for HS residual fuels due to the IMO 2020 mandate.
- Expectations were a 3 – 5 year market correction as the HS glut was absorbed.
- From July – December 2019, the price difference of HSFO and VLSFO increased significantly, peaking in December across global markets in anticipation of IMO 2020.
- However, from January through March 2020, the price differential dramatically dropped with HSFO retaining value against VLSFO. Fuel values furthered decreased due to COVID-19.
- The price ratio % of USGC HSFO to Brent Crude increased from 60% in November 2019 to 89% in August 2020.

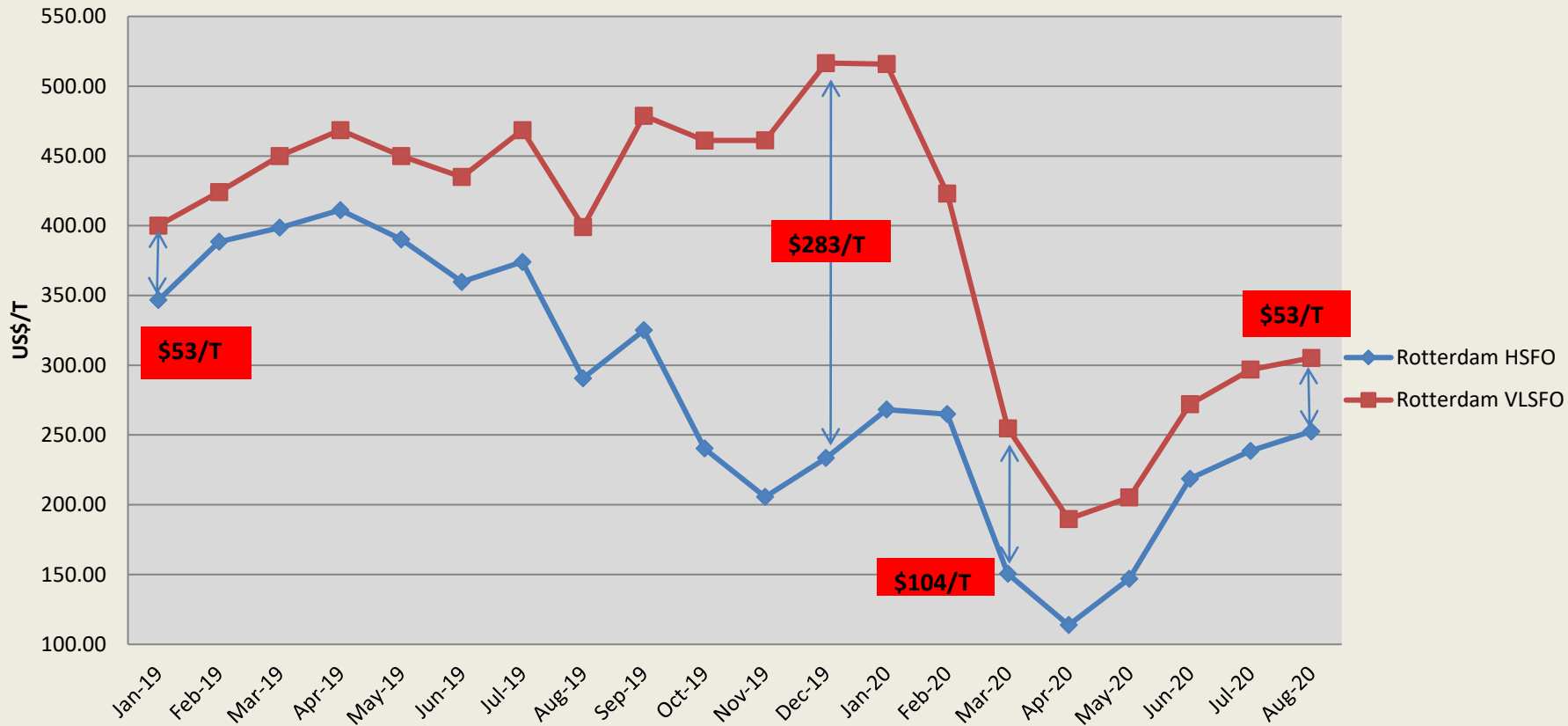
USGC HSFO vs. VLSFO

Price Trend: USGC HSFO vs. VLSFO, 2019 - 2020



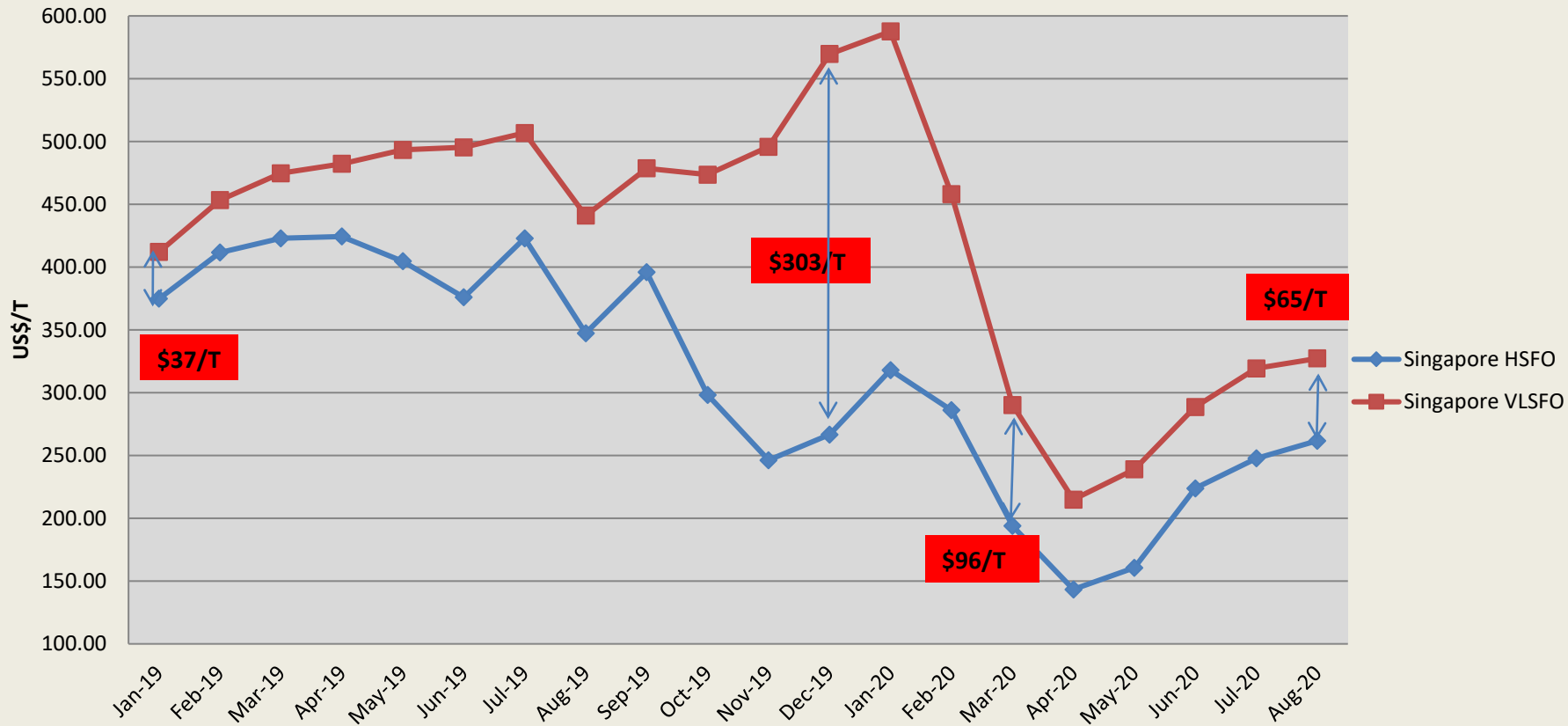
Rotterdam HSFO vs. VLSFO

Price Trend: Rotterdam HSFO vs. VLSFO, 2019 - 2020



Singapore HSFO vs. VLSFO

Price Trend: Singapore HSFO vs. VLSFO, 2019 - 2020



Fuel Oil Valuation Decreases 2019 - 2020

- **US Gulf Coast**

- HSFO

- 2019: \$54/barrel
- 2020: \$33/barrel* -38%

- VLSFO

- 2019: \$70/barrel
- 2020: \$49/barrel * -31%

- **Rotterdam**

- HSFO

- 2019: \$330/T
- 2020: \$207/T - 37%

- VLSFO

- 2019: \$451/T
- 2020: \$308/T -32%

- **Singapore**

- HSFO

- 2019: \$366/T
- 2020: \$229/T* -37%

- VLSFO

- 2019: \$481/T
- 2020: \$341/T* -29%

*January – August 2020

Post IMO 2020 - what happened?

- During 4Q2019, U.S. Refineries began consuming HSFO as a coker feedstock or to blend with light shale crude oils, replacing pricy heavy crude imports.
- HSFO was then replaced with lower priced crudes during March and April as energy values dropped due to COVID-19. Saudi crudes dominated imports to U.S. refineries.
- Since March, VLSFO prices decreased due to a supply glut as a result of the collapse in demand for container trade, the cruise industry and dry bulk due to COVID-19. Bunker demand is forecast to decrease 10 – 15% in 2020 due to lower demand and restrictions on shipping & ship crew movements in many countries.
- With the narrow VLSFO-HSFO price spread, many planned investments into vessel scrubber installations were postponed or cancelled. The short payback assumption with a wide VLSFO-HSFO differential does not currently exist; therefore the investment payback on scrubbers is 3 – 5 years. A spread below \$100/T raises questions on the scrubber investment. The spread narrowed to \$91/T in April.
- Vessels already equipped with scrubber systems consumed HSFO and vessels newly equipped with scrubbers entered the market. During July, HSFO accounted for 24% of bunker sales in Singapore.
- Open-loop marine gas scrubbers, which are 80% of installations, simply convert an air pollution into a water pollution. Many countries are requiring closed-loop in their waters.
- Concerns about VLSFO and blended fuel qualities prior to IMO 2020 do not appear to have been a major issue for vessel operators.

Post IMO 2020 - what happened?

- Changes in demand and refining this summer:
 - HSFO demand in the Middle East increased for power generation (main supply Singapore).
 - HSFO demand increased as more vessels re-entered the market with installed scrubbers.
 - Demand from U.S. refineries for HS resids to replace expensive crudes continued (main supply Russia). The Indian refining industry increased demand for HSFO as a coker feedstock, as well.
 - COVID-19 has impacted the refining industry, with many FCC units at reduced operating rates, shut down or converted to produce bio-fuels; therefore there are reduced supplies of available HSFO.

The overall utilization rate for U.S. refineries is forecast to be 80% in 2020. In PADD 3 (including Texas, Louisiana, Arkansas and New Mexico), the average operating rate for January – June was 83%. The rate was 77.8% in June, up from 75.8% in April. In comparison, the average operating rate July – December 2019 for PADD 3 was 93%.

In late August, the International Energy Association reduced the 2020 oil demand to 91.9 million b/d, the first reduction since the spring reflecting more restrictive measures on mobility due to COVID-19, including reduced demand in the aviation sector.

- Currently HSFO values have recovered to pre-COVID price levels, while VLSFO values have increased, but remain below pre-COVID levels.

Post IMO 2020 – Decant Oil CBO Effects

- HS decant oil remains cheaper than VLSFO; however the price differential remains narrow. There has been price recovery for HSFO and VLSFO since April and prices will eventually recover.
- There could be more limited supplies of available, quality HS decant CBFS due to changes in FCC operation, use as a coker feedstock and with more vessels equipped with scrubbers; however the glut of an oversupply of HS feedstock did not occur this year.
- The refining industry continues to adjust to the changes in demand due to COVID-19; therefore time periods for actions of ship owners and refiners remain uncertain.
- Due to lower carbon black demand worldwide, there were no Gulf Coast CBO exports from mid-April until one ship loaded in late June. There were CBO cargos loaded in July and August for delivery to Asia.
- The U.S. Carbon Black industry continues to invest in off-gas SOx scrubbers under agreements with the EPA. The scrubber systems remain economical investments.
- U.S. HS decant oils continue to be more competitively priced on a delivered basis compared to Chinese CBO mix as a source of CBFS for South Asia:

July 2020: U.S. HS CBO \$294/T CIF South Asia vs. China CBO 60/40 Mix \$416/T CIF South Asia

Thank you ITA!

*We look forward to
meeting you at the
2021 ITA Conference in Rome!*