

October 14, 2019

Indian Refineries Better Prepared to Comply with Bunker Fuel Requirements

Stratas Advisors

Indian crude refineries with complex and modern configurations are now better positioned to deal with challenges of producing compliant bunker fuel. Refineries have a high level of hydrocracking (0.11) and coking (0.16) capacity relative to crude distillation capacity, which allows them to produce LSFO (low sulfur fuel oil).

Indian refineries are getting ready to meet the domestic demand of LSFO (0.5S m/m), which goes into effect on Jan. 1, 2020. The required reduction of bunker fuel sulfur specifications from 3.5% to 0.5% poses the most disruptive and largest challenge for the refining and shipping industries. The refining industry in India has the following options as part of a solution.

- **Blending Options:** Blending HVGO/LVGO/LCO/HCO/VBGO/ with residue oil to produce LSFO (<0.5% S)
- **Refinery Feedstock:** Using low sulfur crude mix (sweet crude) as a refinery input to produce IMO-compliant bunker fuel.
- **Refinery Configuration:** Investment in residue upgradation technologies.

The Indian Oil Corp. (IOCL) has already announced the production of LSFO (<0.5% S) at two location. These two refineries' complex secondary processing units and hydrotreating units has a Nelson Index of >10. The selection of the two refineries is very strategic as the Koyali refinery is on west coast near the Kandla port, and the Haldia refinery is situated on east coast to fulfill international and domestic bunker fuel demand in Indian ports.

Unit: MBPD (Thousands Barrel a day)

Company	Location	CDU	Coker	Catalytic Cracking	Hydro-cracking	Middle Distillates Hydrotreating
Indian Oil Co. Ltd.	Koyali	275	60	20	24	72
Indian Oil Co. Ltd.	Haldia	151	30	14	33	61

Source: *Stratas Advisors*

The total low sulfur fuel oil (<0.5% S) production from IOCL refineries is 18 Mbpd, which is fulfilling India's domestic bunker demand. The total bunker oil demand in India is 25 Mbpd (18 Mbpd for domestic bunkering, 7 Mbpd for international

bunkering).

Unit: MBPD (Thousands Barrel a day)

Company	Location	LSFO Production	Target Date
Indian Oil Co. Ltd.	Koyali	13	October-19
Indian Oil Co. Ltd.	Haldia	5	December-19

Source: *Stratas Advisors*

The IOCL Koyali refinery has opted to use a low-sulfur feed stock crude (North Gujarat Crude) and blending method. The Koyali refinery has five crude distillation units, out of which they plan to distill North Gujarat crude (28° API, sulfur content -0.1%, pour point 27°C, distillate yield low 33-35%, high organic acidity). They have restarted the vis-breaker unit to get low viscous product for bunker fuel blending.

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