

**DETAILED MARKET FEASIBILITY STUDY OF WEAK NITRIC ACID (WNA) & AMMONIUM NITRATE (AN) AT HAZIRA AND SHAHJAHANPUR**

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**Submitted By:**

**Date: March 22, 2022**

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**EXECUTIVE SUMMARY & RECOMMENDATIONS**

1. **Executive Summary**

**Ammonium Nitrate**

The installed capacity of Ammonium Nitrate in India was 1,098 thousand metric tons in FY2015 which increased to 1,100 thousand metric tons in FY2021. The installed capacity of Ammonium Nitrate is further expected to increase to 1,587 thousand metric tons by FY2025.

The production of Ammonium Nitrate in India stood at 575 thousand metric tons in FY2015, further increasing to 744 thousand metric tons in FY2021. The production of Ammonium Nitrate in India is anticipated to reach to 1,217 thousand metric tons by FY2030.

In India, ammonium nitrate domestic consumption stood at 933 thousand metric tons in FY2021, it is expected that domestic consumption of ammonium nitrate will increase at a CAGR of 7.8% by FY2030F and reach up to 1,814 thousand metric tons.

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| India Ammonium Nitrate Installed Capacity, Production, Operating Efficiency, Demand | | | | | |
|  | **2015** | | **2021** | **2025** | **2030** |
| Installed Capacity, By Volume (Thousand Metric Tons) | 1,098 | | 1,100 | 1,587 | 1,587 |
| Production, By Volume (Thousand Metric Tons) | 575 | 744 | | 1,088 | 1,217 |
| Operating Efficiency (%) | 52% | | 68% | 69% | 77% |
| Demand, By Volume (Thousand Metric Tons) | 641 | | 933 | 1,217 | 1,814 |
| Demand Supply Gap | -- | | -- | -129 | -597 |

*References: TechSci Analysis, Secondary Sources, Primary Interviews*

**Capacity & Production**

The installed capacity of Ammonium Nitrate in India operated at an efficiency of 52% in FY2015, which increased to 68% in FY2021. The operational efficiency is further expected to reach to 77% by FY2030.

Demand for Ammonium Nitrate in India was 641 thousand metric tons in FY2015, further increasing to 933 thousand metric tons in FY2021. Demand for Ammonium Nitrate in India in further expected to increase to 1,814 thousand metric tons by FY2030.

|  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| India Ammonium Nitrate Installed Capacity in Thousand Metric Tons By Manufactures | | | | | | | | | | | |
| Company | **FY15** | | | **FY21** | | | | **FY25** | | **FY30** | |
| Deepak Fertilizers and Petrochemicals Limited | 485 | | | 487 | | | | 974 | | 974 | |
| Gujarat Narmada Valley Fertilizers & Chemicals Ltd. | 229 | | | 229 | | | | 229 | | 229 | |
| Rashtriya Chemicals and Fertilizers Limited | 198 | | | 198 | | | | 198 | | 198 | |
| National Fertilizers Limited | 186 | | | 186 | | | | 186 | | 186 | |
| Total | 1,098 | | | 1,100 | | | | 1,587 | | 1,587 | |
| India Ammonium Nitrate Installed Capacity Share By Manufactures | | | | | | | | | | | |
| Company | | **FY15** | | | **FY21** | | | | **FY25** | | **FY30** |
| Deepak Fertilizers and Petrochemicals Limited | | 44% | | | 44% | | | | 61% | | 54% |
| Gujarat Narmada Valley Fertilizers & Chemicals Ltd. | | 21% | | | 21% | | | | 14% | | 13% |
| Rashtriya Chemicals and Fertilizers Limited | | 18% | | | 18% | | | | 12% | | 12% |
| National Fertilizers Limited | | 17% | | | 17% | | | | 12% | | 12% |
| Total | | 100% | | | 100% | | | | 100% | | 100% |
| India Ammonium Nitrate Operating Efficiency, By Manufactures (%) | | | | | | | | | | | |
| Company | | | **2015** | | | **2021** | **2025** | | | **2030** | |
| Deepak Fertilizers and Petrochemicals Limited | | | 63% | | | 87% | 74% | | | 84% | |
| Gujarat Narmada Valley Fertilizers & Chemicals Ltd. | | | 70% | | | 70% | 75% | | | 85% | |
| Rashtriya Chemicals and Fertilizers Limited | | | 51% | | | 75% | 90% | | | 95% | |
| National Fertilizers Limited | | | 5% | | | 6% | 7% | | | 8% | |

*References: TechSci Analysis, Secondary Sources, Primary Interviews, Company Annual Reports*

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| India Ammonium Nitrate Production, By Volume (Thousand Metric Tons), By Manufacturers | | | | |
| Company | **FY15** | **FY21** | **FY25** | **FY30** |
| Deepak Fertilizers and Petrochemicals Limited | 304 | 424 | 725 | 819 |
| Gujarat Narmada Valley Fertilizers & Chemicals Ltd. | 160 | 160 | 171 | 194 |
| Rashtriya Chemicals and Fertilizers Limited | 102 | 149 | 178 | 188 |
| National Fertilizers Limited | 9 | 11 | 13 | 15 |
| Total | 575 | 744 | 1,088 | 1,217 |
| India Ammonium Nitrate Production Share, By Manufacturers | | | | |
| Company (%) | **FY15** | **FY21** | **FY25** | **FY30** |
| Deepak Fertilizers and Petrochemicals Limited | 53% | 57% | 67% | 67% |
| Gujarat Narmada Valley Fertilizers & Chemicals Ltd. | 28% | 22% | 16% | 16% |
| Rashtriya Chemicals and Fertilizers Limited | 18% | 20% | 16% | 15% |
| National Fertilizers Limited | 2% | 1% | 1% | 1% |
| Total | 100% | 100% | 100% | 100% |

*References: TechSci Analysis, Secondary Sources, Primary Interviews, Company Annual Reports*

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Deepak Fertilizers and Petrochemicals Limited | | | | |
|  | **2015** | **2021** | **2025** | **2030** |
| Installed Capacity, By Volume (Thousand Metric Tons) | 485 | 487 | 974 | 974 |
| Production, By Volume (Thousand Metric Tons) | 304 | 424 | 725 | 819 |
| Operating Efficiency (%) | 63% | 87% | 74% | 84% |

*References: TechSci Analysis, Secondary Sources, Primary Interviews, Company Annual Reports*

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Gujarat Narmada Valley Fertilizers & Chemicals Ltd. | | | | |
|  | **2015** | **2021** | **2025** | **2030** |
| Installed Capacity, By Volume (Thousand Metric Tons) | 229 | 229 | 229 | 229 |
| Production, By Volume (Thousand Metric Tons) | 160 | 160 | 171 | 194 |
| Operating Efficiency (%) | 70% | 70% | 75% | 85% |

*References: TechSci Analysis, Secondary Sources, Primary Interviews, Company Annual Reports*

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Rashtriya Chemicals and Fertilizers Limited | | | | |
|  | **2015** | **2021** | **2025** | **2030** |
| Installed Capacity, By Volume (Thousand Metric Tons) | 198 | 198 | 198 | 198 |
| Production, By Volume (Thousand Metric Tons) | 102 | 149 | 178 | 188 |
| Operating Efficiency (%) | 51% | 75% | 90% | 95% |

*References: TechSci Analysis, Secondary Sources, Primary Interviews, Company Annual Reports*

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| National Fertilizers Limited | | | | |
|  | **2015** | **2021** | **2025** | **2030** |
| Installed Capacity, By Volume (Thousand Metric Tons) | 186 | 186 | 186 | 186 |
| Production, By Volume (Thousand Metric Tons) | 9 | 11 | 13 | 15 |
| Operating Efficiency (%) | 5% | 6% | 7% | 8% |

*References: TechSci Analysis, Secondary Sources, Primary Interviews, Company Annual Reports*

Deepak Fertilizers and Petrochemicals Limited had taken initiative to enhance the capacity at maximum level from 485 thousand MT to 487 thousand MT in 2021 after making some changes in the existing process.

Deepak Fertilizers and Petrochemicals Limited operated at an efficiency of 63% in FY2015, which increased to 87% in FY2021. The operational efficiency is further expected to reach to 84% by FY2030.

GNFCL operated at an efficiency of 70% in FY2015, which remained the same in FY2021. The operational efficiency is further expected to reach to 85% by FY2030.

Rashtriya Chemicals and Fertilizers Limited operated at an efficiency of 51% in FY2015, which increased to 75% in FY2021. The operational efficiency is further expected to be 95% by FY2030.

National Fertilizers Limited operated at an efficiency of 5% in FY2015, which increased to 6% in FY2021. The operational efficiency is further expected to reach to 8% by FY2030.

**Planned Capacity Expansion**

RCF, Trombay at present is producing AN-melt at 149,000 MT per annum using Ammonia and dilute Nitric acid in Calcium Ammonium Nitrate (CAN) section of existing Ammonium Nitro Phosphate (ANP) plant after in-house modification of AN Melt section of ANP plant. RCF aims to safely produce up to 575 MTPD (198,000 MTPA) AN Melt from existing plant which is equivalent to 100% capacity utilization. In practical scenario, it is expected to reach only 95% capacity utilization. The enhanced production is possible without any modification / addition in the existing plant.

DFPCL is planning capacity increment of 376,000 MTPA at Gopalpur, Odisha (East Coast). The plant is expected to be commissioned by Q4 FY24 with an aim to cater the east and adjoining central regions of the Indian market.

DFPCL has also initiated debottlenecking to increase technical ammonium nitrate installed capacity by 25% at Taloja manufacturing plant.

DFPCL is also working towards mechanical completion of ammonia (a raw material for weak nitric acid and ammonium nitrate) plant at Taloja, Maharashtra which will lead to zero dependence on imports or domestic third-party ammonia suppliers. This plant is expected to be completed by Q4 FY23 and to have an installed capacity of 500 kilo tons per annum.

NFL plans to increase in capacity utilization at Nangal with an aim to maximize the production of Industrial Products including Ammonium Nitrate. The company has low operating efficiency because of unavailability of storage licensing for ammonium nitrate and halt in calcium ammonium nitrate production. By FY2014, NFL used to manufacture AN melt as an intermediatory product in the calcium ammonium nitrate manufacturing plant, the production of calcium ammonium nitrate has now been halted at NFL.

DFPCL manufactures ammonium nitrate in three forms which are low density ammonium nitrate (LDAN), high density ammonium nitrate (HDAN), and AN melt. LDAN is a value-added product of Deepak Fertilizers. The company is the only manufacturer of HDAN & LDAN.

UDHE, Germany is the technology provider for Deepak Fertilizers’ biggest manufacturing plant at Taloja. For Low Density Ammonium Nitrate (LDAN), Stam carbon (The Netherlands) is the technology provider for DFPCL. Additionally, it also has partnerships with Norsk Hydro (Sweden), and Grande Paroisse (France).

GNFC, RCF, and NFL produce AN melt as an intermediatory product in the production line of calcium ammonium nitrate. Ammonium nitrate is not the primary focus of these companies, so they have not made necessary investments for LDAN, and HDAN production. For Deepak Fertilizers, technical ammonium nitrate is their main product and that’s why they developed dedicated infrastructure, collaborated with technology providers, and made significant investments focused on .AN market.

DFPCL, GNFC, and RCF, all have ammonium nitro phosphate manufacturing lines where they can produce ammonium nitrate as well. These manufacturers have the benefit to choose to manufacture ammonium nitrate in the same manufacturing line.

GNFC is planning a capacity expansion for ammonia manufacturing by installing Ammonia Make-up Gas Convertor Loop [AMUGL], in existing Ammonia Synthesis loop. This is expected to increase the manufacturing capacity by 50,000 MT per annum which will be used for Weak Nitric Acid and Ammonium Nitrate Plants.

The production of Ammonium Nitrate in India stood at 575 thousand metric tons in FY2015, further increased to 744 thousand metric tons in FY2021. The production of Ammonium Nitrate in India is anticipated to reach to 1,217 thousand metric tons by FY2030.

**Demand-Supply Gap**

**Realistic Approach @CAGR 7.8% (Historical CAGR has been @6.6%)**

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | FY15 | FY16 | FY17 | FY18 | FY19 | FY20 | FY21 | FY22 |
| Capacity | 1,098 | 1,098 | 1,098 | 1,098 | 1,098 | 1,098 | 1,100 | 1,211 |
| Production | 575 | 616 | 637 | 719 | 837 | 700 | 744 | 888 |
| Operating rate (%) | 52% | 56% | 58% | 65% | 76% | 64% | 68% | 73% |
| Import | 90 | 190 | 326 | 220 | 273 | 268 | 218 | - |
| Export | 12 | 22 | 22 | 26 | 31 | 21 | 14 | - |
| Inventory | 11 | 12 | 13 | 14 | 17 | 14 | 15 | - |
| Domestic Consumption | 641 | 771 | 928 | 898 | 1,062 | 933 | 933 | 993 |
| Demand Supply Gap | - | - | - | - | - | - | - | -105 |
|  | **FY23** | **FY24** | **FY25** | **FY26** | **FY27** | **FY28** | **FY29** | **FY30** |
| Capacity | 1,211 | 1,587 | 1,587 | 1,587 | 1,587 | 1,587 | 1,587 | 1,587 |
| Production | 888 | 1,056 | 1,088 | 1,107 | 1,127 | 1,168 | 1,198 | 1,217 |
| Operating rate (%) | 73% | 67% | 69% | 70% | 71% | 74% | 75% | 77% |
| Import | - | - | - | - | - | - | - | - |
| Export | - | - | - | - | - | - | - | - |
| Inventory | - | - | - | - | - | - | - | - |
| Domestic Consumption | 1,059 | 1,134 | 1,217 | 1,310 | 1,415 | 1,533 | 1,665 | 1,814 |
| Demand Supply Gap | -172 | -78 | -129 | -204 | -288 | -365 | -467 | -597 |

*References: TechSci Analysis, Secondary Sources, Primary Interviews*

**Optimistic Approach @CAGR 10.8% (Historical CAGR has been @6.6%)**

**India Ammonium Nitrate Market, Demand-Supply Gap, By Volume (Thousand MT)**

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | FY15 | FY16 | FY17 | FY18 | FY19 | FY20 | FY21 | FY22 |
| Capacity | 1,098 | 1,098 | 1,098 | 1,098 | 1,098 | 1,098 | 1,100 | 1,211 |
| Production | 575 | 616 | 637 | 719 | 837 | 700 | 744 | 888 |
| Operating rate (%) | 52% | 56% | 58% | 65% | 76% | 64% | 68% | 73% |
| Import | 90 | 190 | 326 | 220 | 273 | 268 | 218 | - |
| Export | 12 | 22 | 22 | 26 | 31 | 21 | 14 | - |
| Inventory | 11 | 12 | 13 | 14 | 17 | 14 | 15 | - |
| Domestic Consumption | 641 | 771 | 928 | 898 | 1,062 | 933 | 933 | 999 |
| Demand Supply Gap | - | - | - | - | - | - | - | -112 |
|  | **FY23** | **FY24** | **FY25** | **FY26** | **FY27** | **FY28** | **FY29** | **FY30** |
| Capacity | 1,211 | 1,587 | 1,587 | 1,587 | 1,587 | 1,587 | 1,587 | 1,587 |
| Production | 888 | 1,056 | 1,088 | 1,107 | 1,127 | 1,168 | 1,198 | 1,217 |
| Operating rate (%) | 73% | 67% | 69% | 70% | 71% | 74% | 75% | 77% |
| Import | - | - | - | - | - | - | - | - |
| Export | - | - | - | - | - | - | - | - |
| Inventory | - | - | - | - | - | - | - | - |
| Domestic Consumption | 1,079 | 1,318 | 1,455 | 1,582 | 1,725 | 1,886 | 2,068 | 2,275 |
| Demand Supply Gap | -192 | -262 | -367 | -475 | -597 | -718 | -871 | -1,059 |

*References: TechSci Analysis, Secondary Sources, Primary Interviews*

**Pessimistic Approach @CAGR 6.4% (Historical CAGR has been @6.4%)**

**India Ammonium Nitrate Market, Demand-Supply Gap, By Volume (Thousand MT)**

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | FY15 | FY16 | FY17 | FY18 | FY19 | FY20 | FY21 | FY22 |
| Capacity | 1,098 | 1,098 | 1,098 | 1,098 | 1,098 | 1,098 | 1,100 | 1,211 |
| Production | 575 | 616 | 637 | 719 | 837 | 700 | 744 | 888 |
| Operating rate (%) | 52% | 56% | 58% | 65% | 76% | 64% | 68% | 73% |
| Import | 90 | 190 | 326 | 220 | 273 | 268 | 218 | - |
| Export | 12 | 22 | 22 | 26 | 31 | 21 | 14 | - |
| Inventory | 11 | 12 | 13 | 14 | 17 | 14 | 15 | - |
| Domestic Consumption | 641 | 771 | 928 | 898 | 1062 | 933 | 933 | 980 |
| Demand Supply Gap | - | - | - | - | - | - | - | -92 |
|  | **FY23** | **FY24** | **FY25** | **FY26** | **FY27** | **FY28** | **FY29** | **FY30** |
| Capacity | 1,211 | 1,587 | 1,587 | 1,587 | 1,587 | 1,587 | 1,587 | 1,587 |
| Production | 888 | 1,056 | 1,088 | 1,107 | 1,127 | 1,168 | 1,198 | 1,217 |
| Operating rate (%) | 73% | 67% | 69% | 70% | 71% | 74% | 75% | 77% |
| Import | - | - | - | - | - | - | - | - |
| Export | - | - | - | - | - | - | - | - |
| Inventory | - | - | - | - | - | - | - | - |
| Domestic Consumption | 1,032 | 1,090 | 1,155 | 1,228 | 1,309 | 1,399 | 1,501 | 1,614 |
| Demand Supply Gap | -144 | -34 | -67 | -121 | -181 | -232 | -303 | -397 |

*References: TechSci Analysis, Secondary Sources, Primary Interviews*

TechSci has followed three approaches which are realistic approach (forecast CAGR of 7.8%), optimistic approach (forecast CAGR of 10.8%), and pessimistic approach (forecast CAGR of 6.4%). The pessimistic approach is based on the historic CAGR considering business as usual.

**Rational For Realistic Approach:**

The realistic approach is based on the demand from explosives, mining, construction & infrastructure, and other end use sectors.

The India explosives market has been growing significantly with a CAGR of 8.1% from FY2016-FY2022 and expected to reach between 8.5%-9% by FY2030. The market has been growing on the back of demand from mining, construction, and road & infrastructure industry.

The introduction of Ammonium Nitrate Fuel Oil (ANFO) as a blasting agent substitute for conventional emulsion explosives is expected to increase the demand for ammonium nitrate, which is used in the manufacturing of ANFO.

The total coal production in India was at 716 million tons in FY 2021, which is expected to grow with a CAGR of 9.0% by FY2030. The private and captive coal mines produced 70 million tons and 69.6 million tons, respectively in FY2020.The Government of India is expecting to achieve 1 billion tons of coal production by FY 2024 reaching up to 2 billion tons by 2030. India imported 211 million tons of coal in FY2021 as compared to 248.56 million tons in FY2020.

Coal production at Coal India was 596.08 million tons in FY 2021 and 64.04 million tons at Singareni Collieries (SCCL). For FY 2022, Coal India has set a target of 670 million tons of coal production. SCCL plans to achieve 70.3 million tons of coal production by FY2022. Additionally, Coal India has also approved 32 projects out of which 24 are expansions of existing mines and 8 are greenfield projects worth INR 47,000 Crore which would add 81 million tons coal production per annum.

Coal India Ltd. (CIL) has been facing acute shortage of explosives at Eastern Coalfields, Bharat Coking Coal and Mahanadi Coalfields, while others are also seeing lesser supplies.

As a result of the Beirut explosions, regulations such as Ammonium Nitrate Rules have become more stringent leading to a scarcity of AN at mines in India. Currently, the Western Coalfields Limited (WCL) has suffered the worst due to halt in supply and is running at a shortage of 53.58%. It requires 321 MT of ammonium nitrate per day. Similarly, ECL requires 203 MT of ammonium nitrate per day, and currently possess 123 MT, facing a shortage of 39.41%. Bharat Coking Coal Limited (BCCL) is the only subsidiary which hasn’t recorded any shortage yet. It has a requirement of 197.5 MT of ammonium nitrate per day.

This shortage leads to increasing demand of ammonium nitrate in the explosives industry.

In FY2020, the total crude steel production in India stood at 115.5 million tons, making India the second largest producer in the world. The steel industry is expected to achieve production of 300 million tons by FY2030 under National Steel Policy of India.

India accounts to more than 7% of the installed capacity of global cement industry. In FY2021, India’s cement production was 292.2 million tons which is projected to reach up to 550-600 million tons per annum by 2025. The industry is driven by growing commercial and industrial construction leading to increased limestone mining where explosives are used for limestone production.

The infrastructure sector is expected to reach more than INR 50 trillion by FY 2022. Centered on the Hybrid Annuity Model (HAM), the Government of India has initiated more than 60 infrastructure highway projects worth USD 10 billion. To improve the highway network in India, the Government of India has launched the Bharatmala Pariyojana, which is aiming to construct 66,100 km of highways, border and coastal routes and expressways. As of March 2021, total National Highways completed are 1,37,635 km and an estimate of 200,000 km is to be completed in next five years.

The Government of India is promoting indigenous production of ammonium nitrate and weak nitric acid to lessen the dependency on Imports through its Atmanirbhar Bharat initiative. Additionally, the GOI has also introduced schemes such as PLI scheme, 100% FDI, mandatory BIS standards, PCPIR policy, National Mineral Policy, etc to ramp up the domestic production of ammonium nitrate and weak nitric acid.

**Rational For Optimistic Approach:**

The optimistic approach is based on the assumption that all these target end use sectors will attract heavy investments towards planned milestones supported by the positive government regulatory and investment environment by FY2030. Key manufacturers including other stakeholders of ammonium nitrate are also having the similar opinion in line with above.

**Even while considering the pessimistic approach, taking the forecast CAGR of 6.4% there is still a significant demand supply gap of 397 thousand metric tons by FY2030 and so a scope for the client to operate in the market.**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| India Ammonium Nitrate Installed Capacity, Production, Operating Efficiency, Demand — Including NFL & Chambal Scenario | | | | | |
|  | **2015** | | **2021** | **2025** | **2030** |
| Installed Capacity, By Volume (Thousand Metric Tons) | 1,098 | | 1,100 | 1,807 | 1,807 |
| Production, By Volume (Thousand Metric Tons) | 575 | 744 | | 1,226 | 1,408 |
| Operating Efficiency (%) | 52% | | 68% | 68% | 78% |
| Demand, By Volume (Thousand Metric Tons) | 641 | | 933 | 1,217 | 1,814 |
| Demand Supply Gap | -- | | -- | 9 | -406 |

*References: TechSci Analysis, Secondary Sources, Primary Interviews, Company Annual Reports*

**Capacity & Production**

|  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| India Ammonium Nitrate Installed Capacity in Thousand Metric Tons by Manufactures— Including NFL & Chambal Scenario | | | | | | | | | | | |
| Company | **FY15** | | | **FY21** | | | | **FY25** | | **FY30** | |
| Deepak Fertilizers and Petrochemicals Limited | 485 | | | 487 | | | | 974 | | 974 | |
| Gujarat Narmada Valley Fertilizers & Chemicals Ltd. | 229 | | | 229 | | | | 229 | | 229 | |
| Rashtriya Chemicals and Fertilizers Limited | 198 | | | 198 | | | | 198 | | 198 | |
| National Fertilizers Limited | 186 | | | 186 | | | | 186 | | 186 | |
| CFCL | - | | | - | | | | 220 | | 220 | |
| Total | 1,098 | | | 1,100 | | | | 1,807 | | 1,807 | |
| India Ammonium Nitrate Installed Capacity Share by Manufactures— Including NFL & Chambal Scenario | | | | | | | | | | | |
| Company | | **FY15** | | | **FY21** | | | | **FY25** | | **FY30** |
| Deepak Fertilizers and Petrochemicals Limited | | 44% | | | 44% | | | | 54% | | 54% |
| Gujarat Narmada Valley Fertilizers & Chemicals Ltd. | | 21% | | | 21% | | | | 13% | | 13% |
| Rashtriya Chemicals and Fertilizers Limited | | 18% | | | 18% | | | | 11% | | 11% |
| National Fertilizers Limited | | 17% | | | 17% | | | | 10% | | 10% |
| CFCL | | - | | | - | | | | 12% | | 12% |
| Total | | 100% | | | 100% | | | | 100% | | 100% |
| India Ammonium Nitrate Operating Efficiency, By Manufactures (%)— Including NFL & Chambal Scenario | | | | | | | | | | | |
| Company | | | **2015** | | | **2021** | **2025** | | | **2030** | |
| Deepak Fertilizers and Petrochemicals Limited | | | 63% | | | 87% | 74% | | | 84% | |
| Gujarat Narmada Valley Fertilizers & Chemicals Ltd. | | | 70% | | | 70% | 75% | | | 85% | |
| Rashtriya Chemicals and Fertilizers Limited | | | 51% | | | 75% | 90% | | | 95% | |
| National Fertilizers Limited | | | 5% | | | 6% | 22% | | | 28% | |
| CFCL | | | - | | | - | 50% | | | 70% | |

*References: TechSci Analysis, Secondary Sources, Primary Interviews, Company Annual Reports*

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| India Ammonium Nitrate Production, By Volume (Thousand Metric Tons), By Manufacturers— Including NFL & Chambal Scenario | | | | |
| Company | **FY15** | **FY21** | **FY25** | **FY30** |
| Deepak Fertilizers and Petrochemicals Limited | 304 | 424 | 725 | 819 |
| Gujarat Narmada Valley Fertilizers & Chemicals Ltd. | 160 | 160 | 171 | 194 |
| Rashtriya Chemicals and Fertilizers Limited | 102 | 149 | 178 | 188 |
| National Fertilizers Limited | 9 | 11 | 41 | 52 |
| CFCL | - | - | 110 | 154 |
| Total | 575 | 744 | 1,226 | 1,408 |
| India Ammonium Nitrate Production Share, By Manufacturers— Including NFL & Chambal Scenario | | | | |
| Company (%) | **FY15** | **FY21** | **FY25** | **FY30** |
| Deepak Fertilizers and Petrochemicals Limited | 53% | 57% | 59% | 58% |
| Gujarat Narmada Valley Fertilizers & Chemicals Ltd. | 28% | 22% | 14% | 14% |
| Rashtriya Chemicals and Fertilizers Limited | 18% | 20% | 15% | 13% |
| National Fertilizers Limited | 2% | 1% | 3% | 4% |
| CFCL | - | - | 9% | 11% |
| Total | 100% | 100% | 100% | 100% |

*References: TechSci Analysis, Secondary Sources, Primary Interviews, Company Annual Reports*

**India Ammonium Nitrate Market, Demand-Supply Gap, By Volume (Thousand MT) (Including NFL & Chambal Scenario)**

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | FY15 | FY16 | FY17 | FY18 | FY19 | FY20 | FY21 | FY22 |
| Capacity | 1,098 | 1,098 | 1,098 | 1,098 | 1,098 | 1,098 | 1,100 | 1,211 |
| Production | 575 | 616 | 637 | 719 | 837 | 700 | 744 | 888 |
| Operating rate (%) | 52% | 56% | 58% | 65% | 76% | 64% | 68% | 73% |
| Import | 90 | 190 | 326 | 220 | 273 | 268 | 218 | - |
| Export | 12 | 22 | 22 | 26 | 31 | 21 | 14 | - |
| Inventory | 11 | 12 | 13 | 14 | 17 | 14 | 15 | - |
| Demand Supply Gap |  |  |  |  |  |  |  | -105 |
|  | **FY23** | **FY24** | **FY25** | **FY26** | **FY27** | **FY28** | **FY29** | **FY30** |
| Capacity | 1,211 | 1,587 | 1,807 | 1,807 | 1,807 | 1,807 | 1,807 | 1,807 |
| Production | 888 | 1,084 | 1,226 | 1,249 | 1,281 | 1,337 | 1,378 | 1,408 |
| Operating rate (%) | 73% | 68% | 68% | 69% | 71% | 74% | 76% | 78% |
| Import | - | - | - | - | - | - | - | - |
| Export | - | - | - | - | - | - | - | - |
| Inventory | - | - | - | - | - | - | - | - |
| Demand Supply Gap | -171 | -50 | 9 | -61 | -134 | -196 | -287 | -406 |

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| ***Demand at CAGR 7.8%*** | 641 | 771 | 928 | 898 | 1,062 | 933 | 933 | 993 | 1,059 | 1,134 | 1,217 | 1,310 | 1,415 | 1,533 | 1,665 | 1,814 |
| ***Demand -Supply Gap*** | - | - | - | - | - | - | - | -105 | -172 | -50 | 9 | -61 | -134 | -196 | -287 | -406 |

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| ***Demand at CAGR 10.8%*** | 641 | 771 | 928 | 898 | 1062 | 933 | 933 | 999 | 1,079 | 1,318 | 1,455 | 1,582 | 1,725 | 1,886 | 2,068 | 2,275 |
| ***Demand -Supply Gap*** | - | - | - | - | - | - | - | -112 | -192 | -234 | -229 | -332 | -443 | -549 | -690 | -867 |

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Demand at CAGR 6.4%** | 641 | 771 | 928 | 898 | 1062 | 933 | 933 | 980 | 1,032 | 1,090 | 1,155 | 1,228 | 1,309 | 1,399 | 1,501 | 1,614 |
| **Demand -Supply Gap** | - | - | - | - | - | - | - | -92 | -144 | -6 | 71 | 22 | -28 | -62 | -122 | -206 |

*References: TechSci Analysis, Secondary Sources, Primary Interviews*

CFCL has strong focus on manufacturing Urea and selling surplus Ammonia in the merchant market with significantly very less emphasis on manufacturing ammonium nitrate. In addition, if CFCL enters in AN market, it will have to face tough competition from existing competitors in West India. TechSci understands that it is highly unlikely that CFCL will introduce AN plant

NFL has existing two product streams of AN, contributing to a total installed capacity of 1,86,384 MT. Currently, only one stream is functional, producing 11,183 MT. A less possibility exists that The NFL may start operating the second stream which is unlikely to happen as the plant location is at the disadvantage of proximity from customers.

Even considering the above unlikely scenario, there is still a significant demand-supply gap to be capitalized by a new player. However, 2025 is expected to be a challenging year as most of the capacities will get introduced this year.

**NFL Scenario—Availability of Ammonia and Possible AN Prodution**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Ammonia Availability, 2021, MT** | | | | | |  |
| **Manufacturing Plant** | **Ammonia Capacity** | **Ammonia Operating Efficiency** | **Ammonia Production** | **Urea Production** | **Ammonia Required for Urea Production** | **Surplus Ammonia After Consumption in Urea** |
| Bhatinda | 297,000 | 113% | 334,838 | 577,229 | 334,793 | 45 |
| Panipat | 297,000 | 114% | 338,313 | 583,219 | 338,267 | 46 |
| Vijaipur | 1,254,000 | 120% | 1,504,800 | 2,506,640 | 1,453,851 | 50,949 |
| Nangal | 314,000 | 109% | 343,767 | 547,000 | 317,260 | 26,507 |

*References: TechSci Analysis, Secondary Sources, Primary Interviews*

All four plants are currently operating at over capacity utilization, ranging from 109% to 120% and managing ammonia production primarily for the Urea Production. The availability of Ammonia for AN and WNA production is limited and dependent on the Urea production.

|  |  |  |  |
| --- | --- | --- | --- |
| **Ammonium Nitrate at Nangal, 2021, MT** | | **WNA At Nangal, 2021, MT** | |
| Ammonium Nitrate Production | 11,183 | WNA Production | 84,269 |
| Ammonia Required For AN | 2,460 | Ammonia Required for WNA | 24,017 |

*References: TechSci Analysis, Secondary Sources, Primary Interviews*

At the NFL's Nangal plant (as of 2021), the remaining volume of Ammonia (post-production of Urea) produced is used to manufacture AN (11,183 MT & WNA (84, 269 MT). Even in the realistic scenario, the forecast AN production by 2030 is only possible if NFL Nangal increases Ammonia's operating efficiency by 2% from 109% in 2021. Nearby plants at Bhatinda and Panipat do not offer much help as these plants have a minimal surplus. Vijaipur plant in Madhya Pradesh is at a disadvantage of proximity with Nangal Plant because it is not economical to transport Ammonia from Vijaipur than selling in the merchant market. In addition, NFL will always have priority to manufacture Urea over AN being a government-controlled entity.

|  |  |  |  |
| --- | --- | --- | --- |
| **Post-Production Increase Ammonium Nitrate at Nangal, 2024, MT** | | **Post-Production Increase WNA at Nangal, 2024, MT** | |
| Ammonium Nitrate Production at Nangal | 39,141 | WNA Production at Nangal | 127,050 |
| Ammonia Required For AN | 8611 | Ammonia Required for WNA | 36,209 |

|  |  |
| --- | --- |
| **Total Ammonia Required at Nangal, 2024** | **44,820** |

*References: TechSci Analysis, Secondary Sources, Primary Interviews*

Assuming the output from the second stream becomes operational in FY 2024, to manufacture 39,141 MT equivalent of AN, the total Ammonia required at the Nangal plant would be 44,820 MT (for AN and WNA production). Therefore, this scenario is not feasible because of the unavailability of Ammonia.

**Market**

In India, ammonium nitrate domestic consumption stood at 933 thousand metric tons in FY2021. The major demand for ammonium nitrate comes from the explosive industries which constitute close to 88% of overall domestic consumption. After explosives sector, mining sector is the largest consumer of explosives in the country followed by construction and infrastructure. The major demand for explosives comes from Coal India Limited which has annual consumption of approximately 65% of total explosives (AN explosives & other explosives) market in India. Owing to the increasing demand for ammonium nitrate from explosive sectors and increasing mining and construction activities in the country, it is expected that domestic consumption of ammonium nitrate will increase at a CAGR of 7.8% by FY2030F.

**Key Region to Focus**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| India Ammonium Nitrate Market, By Region, By Volume (Thousand Metric Tons) | | | | |
| Region | **2015** | **2021** | **2025** | **2030** |
| East | 244 | 375 | 503 | 776 |
| West | 183 | 276 | 365 | 553 |
| South | 137 | 191 | 244 | 354 |
| North | 77 | 92 | 106 | 131 |
| Total | 641 | 933 | 1,217 | 1,814 |
| India Ammonium Nitrate Market, By Region, By Volume (%) | | | | |
| Region | **2015** | **2021** | **2025** | **2030** |
| East | 38% | 40% | 41% | 43% |
| West | 29% | 30% | 30% | 30% |
| South | 21% | 20% | 20% | 20% |
| North | 12% | 10% | 9% | 7% |
| Total | 100% | 100% | 100% | 100% |

*References: TechSci Analysis, Secondary Sources, Primary Interviews*

|  |  |  |
| --- | --- | --- |
| **Region** | **CAGR (2015-2021)** | **CAGR (2022-2030F)** |
| **East** | **7.4%** | **8.6%** |
| **West** | **7.0%** | **8.2%** |
| **South** | **5.6%** | **7.3%** |
| **North** | **3.1%** | **4.0%** |

It is recommended to target East region from a consumption point of view because of the high demand from the region. Owing to presence of large number of coal mines in Jharkhand, Odisha, West Bengal etc. along with high demand of ammonium nitrate from Coal India Ltd. the region contributes to approximately 38% of the market demand. Ammonium nitrate is used at blasting agents in the mines. It is also used to manufacture explosives which are then used in the mines. The region has a consumption volume of 375 thousand MT in FY2021 which is expected to grow with a CAGR of 8.6% and reach at consumption of 776 thousand MT in FY2030.

Followed by this, it is also recommended to target west region as it is the base for several big explosives manufacturers. Solar Explosives Ltd., one of India’s largest explosives manufacturers has plant set-up in Mumbai, Maharashtra. Solar Explosives procures ammonium nitrate to manufacture ANFO explosives. West region contributes to approximately 30% of the total market consumption in FY2021 which is 276 thousand MT in terms of volume. The region is expected to grow with a CAGR of 8.2% to reach up to 553 thousand MT in FY2030.

**Major Explosives Companies Manufacturing Plant in East India:**

|  |  |  |
| --- | --- | --- |
| Company | State | Location |
| Solar Explosives Location | Odisha | Angul Jharsuguda Keonjhar |
| West Bengal | Bardhaman |
| Jharkhand | Hazaribagh Dhanbad |
| IDL Explosives Location | Odisha | Rourkela Angul |
| West Bengal | Bardhaman |
| Jharkhand | Dhanbad Rajarappa |
| IEL | Jharkhand | Gomia |
| Black Diamond Explosives Pvt. Ltd. | Jharkhand | Dhanbad |

*References: TechSci Analysis, Secondary Sources, Primary Interviews*

Other explosives manufacturers present in East India include IBP CO. Limited, AKS Expo-Chem Pvt. Ltd., Orissa Explosives, Gulf Oil Corporation Ltd., etc.

**Key Consumption Sectors to Focus**

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| India Ammonium Nitrate Market, By Consumption Sectors, By Volume (Thousand Metric Tons) | | | | | | | | |
| Consumption Sector | | **FY15** | **FY21** | | **FY25** | | **FY30** | |
| Explosives | | 563 | 818 | | 1068 | | 1592 | |
| Mining | | 30 | 43 | | 56 | | 83 | |
| Commercial & infrastructure | | 17 | 25 | | 33 | | 50 | |
| Pharmaceuticals | | 14 | 21 | | 28 | | 42 | |
| Others | | 17 | 25 | | 33 | | 48 | |
| Total | | 641 | 933 | | 1,217 | | 1,814 | |
| India Ammonium Nitrate Market, By Consumption Sectors, By Volume (%) | | | | | | | | |
| Consumption Sector | **FY15** | | | **FY21** | | **FY25** | | **FY30** |
| Explosives | 87.8% | | | 87.7% | | 87.8% | | 87.8% |
| Mining | 4.7% | | | 4.6% | | 4.6% | | 4.6% |
| Commercial & infrastructure | 2.7% | | | 2.7% | | 2.7% | | 2.8% |
| Pharmaceuticals | 2.2% | | | 2.3% | | 2.3% | | 2.3% |
| Others | 2.7% | | | 2.7% | | 2.7% | | 2.6% |
| Total | 100.0% | | | 100.0% | | 100.0% | | 100.0% |

|  |  |  |
| --- | --- | --- |
| **Consumption Sectors** | **CAGR (2015-2021)** | **CAGR (2022-2030F)** |
| **Explosives** | 6.4% | 7.8% |
| **Mining** | 6.1% | 7.7% |
| **Commercial & Infrastructure** | 6.9% | 8.1% |
| **Pharmaceuticals** | 6.6% | 8.0% |
| **Others** | 6.6% | 7.4% |

*Others include Freezing Mixtures, Rocket Propellants, Paints, Plastics, etc.*

*References: TechSci Analysis, Secondary Sources, Primary Interviews*

It is recommended to target Explosive’s consumption sector because of the high demand from the sector. Owing to drastically growing demand of ANFO and other ammonium nitrate-based emulsion explosives the sector contributes to approximately 88% of the market demand. The growing demand of ANFO along with Coal India’s shortage of explosives is one of major drivers of this segment. Coal India Ltd. (CIL) has been facing acute shortage of explosives at Eastern Coalfields, Bharat Coking Coal and Mahanadi Coalfields, while others are also seeing lesser supplies.

CIL on an average buy explosives worth INR 2,000 Crores annually and even the company’s smaller subsidiaries such as Eastern Coalfields Limited (ECL) receive 45 to 50 ammonium nitrate loaded tankers a day. The explosives consumption sector is expected to maintain dominance in the forecast period and grow with a highest CAGR of 7.8%. The market is forecasted to reach up to 1,592 thousand MT from the current 818 thousand MT.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| India Ammonium Nitrate Market, By Product Type, By Volume (Thousand MT) | | | | |
|  | **FY15** | **FY21** | **FY25** | **FY30** |
| HDAN | 336 | 478 | 616 | 902 |
| AN Melt | 270 | 399 | 525 | 790 |
| LDAN | 35 | 56 | 77 | 122 |
| Total | 641 | 933 | 1,217 | 1,814 |

|  |  |  |
| --- | --- | --- |
| **Product Type** | **CAGR FY2015-FY2021** | **CAGR FY2022-FY2030** |
| **HDAN** | 6.1% | 7.5% |
| **AN Melt** | 6.7% | 8.0% |
| **LDAN** | 8.0% | 9.2% |

*References: TechSci Analysis, Secondary Sources, Primary Interviews*

Deepak Fertilizers is the only manufacturer of all three forms of ammonium nitrate, which are HDAN, LDAN, and AN melt. LDAN is a value-added product of DFPCL. GNFC, RCF, and NFL only manufacture AN melt. GNFC uses converter companies to convert AN melt into HDAN.

HDAN has the highest market size of 478 thousand metric tons in FY 2021, increasing from 336 thousand metric tons in FY 2015 growing with a CAGR of 6.1%. The market for HDAN is expected to reach up to 902 thousand metric tons by FY 2030 growing with a CAGR of 7.5%. HDAN is followed by AN melt and LDAN with market size of 399 thousand metric tons and 56 thousand metric tons, respectively.

**India Ammonium Nitrate Market, Sales By Company, By Volume (% share) – FY2021**

*Others include Imports*

|  |  |
| --- | --- |
| Company | Sales, By Volume (Thousand Metric Tons) |
| Deepak Fertilizers and Petrochemicals Limited | 428 |
| Gujarat Narmada Valley Fertilizers & Chemicals Ltd | 159 |
| Rashtriya Fertilizers and Chemicals Limited | 140 |
| National Fertilizers Limited | 9 |
| Other | 198 |
| Total | 934 |

*References: TechSci Analysis, Secondary Sources, Primary Interviews, Company Annual Reports*

**Price**

|  |  |  |
| --- | --- | --- |
| India Import Average Selling Price of Ammonium Nitrate – CIF Price (INR Per Metric Ton) | | |
| Years | **INR/Ton** | |
| 2015 | 21,717 | |
| 2021 | 19,058 | |
| 2025 | 23,327 | |
| 2030 | 25,492 | |
| India Export Average Selling Price of Ammonium Nitrate - FOB Price (INR Per Metric Ton) | | |
| Years | | **INR/Ton** |
| 2015 | | 26,632 |
| 2021 | | 27,859 |
| 2025 | | 24,596 |
| 2030 | | 28,480 |
| India Ex-Factory Average Selling Price of Ammonium Nitrate (INR Per Metric Ton) | | |
| Years | | **INR/Ton** |
| 2015 | | 38,208 |
| 2021 | | 38,323 |
| 2025 | | 34,794 |
| 2030 | | 39,334 |

*References: TechSci Analysis, Secondary Sources, Primary Interviews, Ministry of Commerce, DGFT*

**Anti-Dumping Duty & Landed Cost (INR/MT), By Year**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| 2018 | | | | 2019 | | |
| Country Name | **ASP** | **Anti-dumping duty (INR/MT)** | **Landed Cost (ASP+ Anti-Dumping) INR/MT** | **ASP** | **Anti-dumping duty (INR/MT)** | **Landed Cost (ASP+ Anti-Dumping) INR/MT** |
| Russia | 17,118 | 867 | 17,985 | 20,993 | 867 | 21,860 |
| Russia\* |  | 1,897 | 19,015 |  | 1,897 | 22,890 |
| Indonesia | 16,103 | 1,978 | 18,082 | - | 1,978 | - |
| Georgia | 16,199 | 4,097 | 20,296 | - | 4,097 | - |
| Iran | 13,937 | 4,580 | 18,517 | 14,074 | 4,580 | 18,654 |

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| 2020 | | | | 2021 | | |
| Country Name | **ASP** | **Anti-dumping duty (INR/MT)** | **Landed Cost (ASP + Anti-dumping) INR/MT** | **ASP** | **Anti-dumping duty (INR/MT)** | **Landed Cost (ASP+ Anti-Dumping) INR/MT** |
| Russia | 20,993 | 867 | 21,860 | 18914 | 867 | 19,780 |
| Russia\* |  | 1,897 | 22,890 |  | 1,897 | 20,811 |
| Indonesia | - | 1,978 | - | - | 1,978 | - |
| Georgia | - | 4,097 | - | - | 4,097 | - |
| Iran | - | 4,580 | - | - | 4,580 | - |

*\*Two different anti-dumping duty is imposed on Russia from two different companies. Anti-dumping duty of INR 867 per ton is imposed on JSC Azot, Kemerovo (technical ammonium nitrate manufacturer). For manufacturers other than on JSC Azot, Kemerovo, anti-dumping duty of INR 1,897 per ton is imposed.*

**Transportation and Logistics**

Ammonium nitrate is manufactured in three forms namely low-density ammonium nitrate (LDAN), high density ammonium nitrate (HDAN), and ammonium nitrate melt (AN melt).

LDAN and HDAN have lesser logistic cost as these are easier to transport. LDAN and HDAN are transported in HDPE bags. They are transported in 25 kg ,50 kg ,100kg,1000 kg and1200 kg bags. The bags are made of laminated HDPE woven fabric with inner liners made of LDPE. The bags are packed after thermal heat sealing of liners and stitched with HDPE which provides protection from weather and handling in transportation, sustaining its quality. LDAN and HDAN can be transported for more than 1000 km without any technical issues. The transportation cost for these grades is 2.5-3 INR per ton per km. Ideally, these products are moved in 50 kg bags in truck with truck capacity of 30 MT. LDAN and HDAN are imported in jumbo packs of 1 MT each.

AN melt has technical and transportation issues as it can neither be transported to more than 1000 km nor be imported. Domestically AN melt is transported in insulated tankers which are preheated at 120 degrees Celsius. These trucks have capacity of 25-35 MT. Since there is a transportation limitation, GNFC uses converter companies who convert AN melt into HDAN and then transport it to explosives manufacturers at longer distance. For 1000 km, transportation cost of AN melt is 3,500-4,000 INR per MT.

|  |  |  |  |
| --- | --- | --- | --- |
| LDAN/HDAN | | | |
| Distance (KM) | **Capacity (MT)** | **Per Km Per MT (INR)** | **Final Price Per Truck (INR)** |
| 100 | 25 | 3.60 | 9,000 |
| 200 | 25 | 3.40 | 17,000 |
| 300 | 25 | 3.25 | 24,375 |
| 400 | 25 | 3.10 | 31,000 |
| 500 | 25 | 3.00 | 37,500 |
| AN Melt | | | |
| Distance (KM) | **Capacity (MT)** | **Per Km Per MT (INR)** | **Final Price Per Tanker (INR)** |
| 100 | 25 | 5.00 | 12,500 |
| 200 | 25 | 4.75 | 23,750 |
| 300 | 25 | 4.50 | 33,750 |
| 400 | 25 | 4.30 | 43,000 |
| 500 | 25 | 4.20 | 52,500 |

**Weak Nitric Acid Market**

The installed capacity of weak nitric acid in India was 1,628 thousand metric tons in FY2015 which increased to 1,814 thousand metric tons in FY2021. The installed capacity of weak nitric acid is anticipated to increase up to 2,177 thousand metric tons by FY2025.

The production of weak nitric acid in India stood at 1,319 thousand metric tons in FY2015, further increasing to 1,471 thousand metric tons in FY2021. The production of weak nitric acid in India is anticipated to reach to 1,931 thousand metric tons by FY2030.

The installed capacity of weak nitric acid in India operated at 81% efficiency in FY2015, which remains the same in FY2021. The operational efficiency is expected to reach to 89% by FY2030.

The demand for weak nitric acid in India was 1,275 thousand metric tons in FY2015, further increasing to 1,456 thousand metric tons in FY2021. Demand for weak nitric acid in India in further expected to increase to 2,414 thousand metric tons by FY2030.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| India Weak Nitric Acid Installed Capacity, Production, Operating Efficiency, Demand | | | | |
|  | **2015** | **2021** | **2025** | **2030** |
| Installed Capacity, By Volume (Thousand Metric Tons) | 1,628 | 1,814 | 2,177 | 2,177 |
| Production, By Volume (Thousand Metric Tons) | 1,319 | 1,471 | 1,782 | 1,931 |
| Operating Efficiency (%) | 81% | 81% | 82% | 89% |
| Demand, By Volume (Thousand Metric Tons) | 1,275 | 1,456 | 2,250 | 2,414 |
| Demand-Supply Gap | -- | -- | -468 | -483 |

*References: TechSci Analysis, Secondary Sources, Primary Interviews*

**Capacity & Production**

The installed capacity of weak nitric acid in India was 1,628 thousand metric tons in FY2015 which increased to 1,814 thousand metric tons in FY2021.

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| India Weak Nitric Acid Installed Capacity, By Company, By Volume (Thousand Metric Tons) | | | | | | | | |
| Company | **FY15** | | | **FY21** | **FY25** | | **FY30** | |
| Deepak Fertilizers and Petrochemicals Limited | 703 | | | 889 | 1,186 | | 1,186 | |
| Rashtriya Chemicals and Fertilizers Limited | 396 | | | 396 | 396 | | 396 | |
| Gujarat Narmada Valley Fertilizers & Chemicals Ltd. | 348 | | | 348 | 348 | | 348 | |
| National Fertilizers Limited | 182 | | | 182 | 182 | | 182 | |
| Kutch Chemical | - | | | - | 66 | | 66 | |
| Total | 1,628 | | | 1,814 | 2,177 | | 2,177 | |
| India Weak Nitric Acid Installed Capacity, By Company, By Volume (%) | | | | | | | | |
| Company | | **FY15** | **FY21** | | | **FY25** | | **FY30** |
| Deepak Fertilizers and Petrochemicals Limited | | 43% | 49% | | | 54% | | 54% |
| Rashtriya Chemicals and Fertilizers Limited | | 24% | 22% | | | 18% | | 18% |
| Gujarat Narmada Valley Fertilizers & Chemicals Ltd. | | 21% | 19% | | | 16% | | 16% |
| National Fertilizers Limited | | 11% | 10% | | | 8% | | 8% |
| Kutch Chemical | | - | - | | | 3% | | 3% |
| Total | | 100% | 100% | | | 100% | | 100% |

*References: TechSci Analysis, Secondary Sources, Primary Interviews, Company Annual Reports*

|  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| India Weak Nitric Acid Production, By Company, By Volume (Thousand Metric Tons) | | | | | | | | | | | | |
| Company | | | **FY15** | | | **FY21** | | | **FY25** | | | **FY30** |
| Deepak Fertilizers and Petrochemicals Limited | | | 429 | | | 626 | | | 839 | | | 958 |
| Rashtriya Chemicals and Fertilizers Limited | | | 376 | | | 368 | | | 384 | | | 392 |
| Gujarat Narmada Valley Fertilizers & Chemicals Ltd. | | | 425 | | | 393 | | | 429 | | | 436 |
| National Fertilizers Limited | | | 89 | | | 84 | | | 91 | | | 100 |
| Kutch Chemical | | | - | | | - | | | 40 | | | 46 |
| Total | | | 1,319 | | | 1,471 | | | 1,782 | | | 1,931 |
| India Weak Nitric Acid Production, By Company, By Volume (%) | | | | | | | | | | | | |
| Company | **FY15** | | | **FY21** | | | **FY25** | | | **FY30** | | |
| Deepak Fertilizers and Petrochemicals Limited | 33% | | | 43% | | | 47% | | | 50% | | |
| Rashtriya Chemicals and Fertilizers Limited | 29% | | | 25% | | | 22% | | | 20% | | |
| Gujarat Narmada Valley Fertilizers & Chemicals Ltd. | 32% | | | 27% | | | 24% | | | 23% | | |
| National Fertilizers Limited | 7% | | | 6% | | | 5% | | | 5% | | |
| Kutch Chemical | - | | | - | | | 2% | | | 2% | | |
| Total | 100% | | | 100% | | | 100% | | | 100% | | |
| India Weak Nitric Acid Operating Efficiency, By Company (%) | | | | | | | | | | | | |
| Company | | **2015** | | | **2021** | | | **2025** | | | **2030** | |
| Deepak Fertilizers and Petrochemicals Limited | | 61% | | | 70% | | | 71% | | | 81% | |
| Rashtriya Chemicals and Fertilizers Limited | | 95% | | | 93% | | | 97% | | | 99% | |
| Gujarat Narmada Valley Fertilizers & Chemicals Ltd. | | 122% | | | 113% | | | 123% | | | 125% | |
| National Fertilizers Limited | | 49% | | | 46% | | | 50% | | | 55% | |
| Kutch Chemical | | - | | | - | | | 60% | | | 70% | |

*References: TechSci Analysis, Secondary Sources, Primary Interviews, Company Annual Reports*

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Deepak Fertilizers and Petrochemicals Limited | | | | |
|  | **2015** | **2021** | **2025** | **2030** |
| Installed Capacity, By Volume (Thousand Metric Tons) | 703 | 889 | 1,186 | 1,186 |
| Production, By Volume (Thousand Metric Tons) | 429 | 626 | 839 | 958 |
| Operating Efficiency (%) | 61% | 70% | 71% | 81% |

*References: TechSci Analysis, Secondary Sources, Primary Interviews, Company Annual Reports*

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Gujarat Narmada Valley Fertilizers & Chemicals Ltd. | | | | |
|  | **2015** | **2021** | **2025** | **2030** |
| Installed Capacity, By Volume (Thousand Metric Tons) | 348 | 348 | 348 | 348 |
| Production, By Volume (Thousand Metric Tons) | 425 | 393 | 429 | 436 |
| Operating Efficiency (%) | 122% | 113% | 123% | 125% |

*References: TechSci Analysis, Secondary Sources, Primary Interviews, Company Annual Reports*

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Rashtriya Chemicals and Fertilizers Limited | | | | |
|  | **2015** | **2021** | **2025** | **2030** |
| Installed Capacity, By Volume (Thousand Metric Tons) | 396 | 396 | 396 | 396 |
| Production, By Volume (Thousand Metric Tons) | 376 | 368 | 384 | 392 |
| Operating Efficiency (%) | 95% | 93% | 97% | 99% |

*References: TechSci Analysis, Secondary Sources, Primary Interviews, Company Annual Reports*

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| National Fertilizers Limited | | | | |
|  | **2015** | **2021** | **2025** | **2030** |
| Installed Capacity, By Volume (Thousand Metric Tons) | 182 | 182 | 182 | 182 |
| Production, By Volume (Thousand Metric Tons) | 89 | 84 | 91 | 100 |
| Operating Efficiency (%) | 49% | 46% | 50% | 55% |

*References: TechSci Analysis, Secondary Sources, Primary Interviews, Company Annual Reports*

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Kutch Chemical Limited | | | | |
|  | **2015** | **2021** | **2025** | **2030** |
| Installed Capacity, By Volume (Thousand Metric Tons) | - | - | 66 | 66 |
| Production, By Volume (Thousand Metric Tons) | - | - | 40 | 46 |
| Operating Efficiency (%) | - | - | 60% | 70% |

*References: TechSci Analysis, Secondary Sources, Primary Interviews, Company Annual Reports*

Deepak Fertilizers and Petrochemicals Limited had taken initiative to enhance the capacity at maximum level from 885 thousand MT in FY2020 to 889 thousand MT in 2021 after making some changes in the existing process.

The production of weak nitric acid in India stood at 1,319 thousand metric tons in FY2015, further increasing to 1,471 thousand metric tons in FY2021. The production of Weak Nitric Acid in India is anticipated to reach to 1,931 thousand metric tons by FY2030.

The installed capacity of weak nitric acid with Deepak Fertilizers and Petrochemicals Limited operated at an efficiency of 61% in FY2015, which increased to 70% in FY2021. The operational efficiency is further expected to reach to 81% by FY2030.

The installed capacity of weak nitric acid with Rashtriya Chemicals and Fertilizers Limited operated at an efficiency of 95% in FY2015, which dipped to 93% in FY2021. The operational efficiency is expected to reach to 99% by FY2030.

The installed capacity of weak nitric acid with GNFCL operated at an efficiency of 122% in FY2015, which dipped to 113% in FY2021. The operational efficiency is expected to reach to 125% by FY2030.

The installed capacity of Weak Nitric Acid with National Fertilizers Limited operated at an efficiency of 49% in FY2015, which dipped to 46% in FY2021. The operational efficiency is further expected to reach to 55% by FY2030.

**Planned Capacity Expansions**

DFPCL is working towards mechanical completion of ammonia (a raw material for weak nitric and ammonium acid) plant at Taloja, Maharashtra which will lead to zero dependence on imports or domestic third-party ammonia suppliers. This plant is expected to be completed by Q4 FY23 and to have an installed capacity of 500 kilo tons per annum. Weatherly Inc. (U.S.A.) is the technology provider for Deepak Fertilizers for weak nitric acid.

GNFC is planning a capacity expansion for ammonia manufacturing by installing Ammonia Make-up Gas Convertor Loop [AMUGL], in existing Ammonia Synthesis loop. This is expected to increase the manufacturing capacity by 50,000 MT per annum which will be used for Weak Nitric Acid and Ammonium Nitrate Plants.

Kutch Chemical Industries Limited is planning to set up a WNA manufacturing plant with installed capacity of 66 thousand metric tons per annum and 49.5 thousand metric tons per annum for CNA. The company is purchasing old existing plant from Europe. Payments for this plant have already been done and it will be operational from FY 2022. Currently, the company is procuring WNA from DFPCL, and GNFC. Kutch Chemicals will use WNA to captively manufacture CNA, they will not supply it to the market.

**Demand-Supply Gap**

**India Weak Nitric Acid Market, Demand-Supply Gap, By Volume (Thousand MT)**

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | FY15 | FY16 | FY17 | FY18 | FY19 | FY20 | FY21 | FY22 |
| Capacity | 1,628 | 1,628 | 1,628 | 1,628 | 1,810 | 1,810 | 1,814 | 1,814 |
| Production | 1,319 | 1,399 | 1,421 | 1,546 | 1,596 | 1,553 | 1,471 | 1,565 |
| Operating rate (%) | 81% | 86% | 87% | 95% | 88% | 86% | 81% | 86% |
| Import | 0 | 0 | 4 | 27 | 36 | 30 | 26 | - |
| Export | 17 | 14 | 11 | 16 | 11 | 13 | 12 | - |
| Inventory | 26 | 28 | 28 | 31 | 32 | 31 | 29 | - |
| Domestic Consumption | 1,275 | 1,357 | 1,385 | 1,527 | 1,589 | 1,539 | 1,456 | 1,660 |
| Demand Supply Gap | - | - | - | - | - | - | - | -95 |
|  | **FY23** | **FY24** | **FY25** | **FY26** | **FY27** | **FY28** | **FY29** | **FY30** |
| Capacity | 1,814 | 2,111 | 2,177 | 2,177 | 2,177 | 2,177 | 2,177 | 2,177 |
| Production | 1,565 | 1,704 | 1,782 | 1,852 | 1,904 | 1,904 | 1,931 | 1,931 |
| Operating rate (%) | 86% | 81% | 82% | 85% | 87% | 87% | 89% | 89% |
| Import | - | - | - | - | - | - | - | - |
| Export | - | - | - | - | - | - | - | - |
| Inventory | - | - | - | - | - | - | - | - |
| Domestic Consumption | 1,797 | 1,950 | 2,250 | 2,268 | 2,293 | 2,325 | 2,365 | 2,414 |
| Demand Supply Gap | -232 | -246 | -468 | -416 | -389 | -421 | -433 | -483 |

*References: TechSci Analysis, Secondary Sources, Primary Interviews*

As of FY2022 there is demand-supply gap in weak nitric acid; there is a shortage of supply by 95 thousand metric tons. However, the gap is expected to increase in the forecast period owing to the increasing demand from ammonia nitrate and fertilizers applications sectors. The market is estimated to observe a demand-supply gap of 483 thousand metric by FY2030.

A high demand-supply gap exists starting from 95KMT in 2022 and reaching 483KMT in 2030

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| India Weak Nitric Acid Installed Capacity, Production, Operating Efficiency, Demand —Including GNFC, CFCL & NFL Capacity Expansions | | | | |
|  | **2015** | **2021** | **2025** | **2030** |
| Installed Capacity, By Volume (Thousand Metric Tons) | 1,628 | 1,814 | 2,588 | 2,588 |
| Production, By Volume (Thousand Metric Tons) | 1,319 | 1,471 | 1,954 | 2,217 |
| Operating Efficiency (%) | 81% | 81% | 76% | 86% |
| Demand, By Volume (Thousand Metric Tons) | 1,275 | 1,456 | 2,250 | 2,414 |
| Demand-Supply Gap | -- | -- | -296 | -198 |

*References: TechSci Analysis, Secondary Sources, Primary Interviews*

**Capacity & Production**

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| India Weak Nitric Acid Installed Capacity, By Company, By Volume (Thousand Metric Tons) —Including GNFC, CFCL & NFL Capacity Expansions | | | | | | | | |
| Company | **FY15** | | | **FY21** | **FY25** | | **FY30** | |
| Deepak Fertilizers and Petrochemicals Limited | 703 | | | 889 | 1,186 | | 1,186 | |
| Rashtriya Chemicals and Fertilizers Limited | 396 | | | 396 | 396 | | 396 | |
| Gujarat Narmada Valley Fertilizers & Chemicals Ltd. | 348 | | | 348 | 579 | | 579 | |
| National Fertilizers Limited | 182 | | | 182 | 182 | | 182 | |
| Chambal Fertilizers and Chemicals Limited | - | | | - | 180 | | 180 | |
| Kutch Chemical | - | | | - | 66 | | 66 | |
| Total | 1,628 | | | 1,814 | 2,588 | | 2,588 | |
| India Weak Nitric Acid Installed Capacity, By Company, By Volume (%)—Including GNFC, CFCL & NFL Capacity Expansions | | | | | | | | |
| Company | | **FY15** | **FY21** | | | **FY25** | | **FY30** |
| Deepak Fertilizers and Petrochemicals Limited | | 43% | 49% | | | 46% | | 46% |
| Rashtriya Chemicals and Fertilizers Limited | | 24% | 22% | | | 15% | | 15% |
| Gujarat Narmada Valley Fertilizers & Chemicals Ltd. | | 21% | 19% | | | 22% | | 22% |
| National Fertilizers Limited | | 11% | 10% | | | 7% | | 7% |
| Chambal Fertilizers and Chemicals Limited | | - | - | | | 7% | | 7% |
| Kutch Chemical | | - | - | | | 3% | | 3% |
| Total | | 100% | 100% | | | 100% | | 100% |

*References: TechSci Analysis, Secondary Sources, Primary Interviews, Company Annual Reports*

|  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| India Weak Nitric Acid Production, By Company, By Volume (Thousand Metric Tons) —Including GNFC, CFCL & NFL Capacity Expansions | | | | | | | | | | | | |
| Company | | | **FY15** | | | **FY21** | | | **FY25** | | | **FY30** |
| Deepak Fertilizers and Petrochemicals Limited | | | 429 | | | 626 | | | 839 | | | 958 |
| Rashtriya Chemicals and Fertilizers Limited | | | 376 | | | 368 | | | 384 | | | 392 |
| Gujarat Narmada Valley Fertilizers & Chemicals Ltd. | | | 425 | | | 393 | | | 475 | | | 550 |
| National Fertilizers Limited | | | 89 | | | 84 | | | 127 | | | 145 |
| Chambal Fertilizers and Chemicals Limited | | | - | | | - | | | 90 | | | 126 |
| Kutch Chemical | | | - | | | - | | | 40 | | | 46 |
| Total | | | 1,319 | | | 1,471 | | | 1,954 | | | 2,217 |
| India Weak Nitric Acid Production, By Company, By Volume (%)—Including GNFC, CFCL & NFL Capacity Expansions | | | | | | | | | | | | |
| Company | **FY15** | | | **FY21** | | | **FY25** | | | **FY30** | | |
| Deepak Fertilizers and Petrochemicals Limited | 29% | | | 25% | | | 20% | | | 18% | | |
| Rashtriya Chemicals and Fertilizers Limited | 32% | | | 27% | | | 24% | | | 25% | | |
| Gujarat Narmada Valley Fertilizers & Chemicals Ltd. | 7% | | | 6% | | | 6% | | | 7% | | |
| National Fertilizers Limited | - | | | - | | | 5% | | | 6% | | |
| Chambal Fertilizers and Chemicals Limited | - | | | - | | | 2% | | | 2% | | |
| Kutch Chemical | 29% | | | 25% | | | 20% | | | 18% | | |
| Total | 100% | | | 100% | | | 100% | | | 100% | | |
| India Weak Nitric Acid Operating Efficiency, By Company (%)—Including GNFC, CFCL & NFL Capacity Expansions | | | | | | | | | | | | |
| Company | | **2015** | | | **2021** | | | **2025** | | | **2030** | |
| Deepak Fertilizers and Petrochemicals Limited | | 61% | | | 70% | | | 71% | | | 81% | |
| Rashtriya Chemicals and Fertilizers Limited | | 95% | | | 93% | | | 97% | | | 99% | |
| Gujarat Narmada Valley Fertilizers & Chemicals Ltd. | | 122% | | | 113% | | | 82% | | | 95% | |
| National Fertilizers Limited | | 49% | | | 46% | | | 70% | | | 80% | |
| Chambal Fertilizers and Chemicals Limited | | - | | | - | | | 50% | | | 70% | |
| Kutch Chemical | | - | | | - | | | 60% | | | 70% | |

*References: TechSci Analysis, Secondary Sources, Primary Interviews, Company Annual Reports*

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| India Weak Nitric Acid, Demand-Supply Gap, By Volume (Thousand MT) —Including GNFC, CFCL & NFL Capacity Expansions | | | | | | | | |
|  | **FY15** | **FY16** | **FY17** | **FY18** | **FY19** | **FY20** | **FY21** | **FY22** |
| Capacity | 1,628 | 1,628 | 1,628 | 1,628 | 1,810 | 1,810 | 1,814 | 1,814 |
| Production | 1,319 | 1,399 | 1,421 | 1,546 | 1,596 | 1,553 | 1,471 | 1,565 |
| Operating rate (%) | 52% | 56% | 58% | 65% | 76% | 64% | 68% | 73% |
| Import | 0.02 | 0.02 | 4 | 27 | 36 | 30 | 26 | - |
| Export | 17 | 14 | 11 | 16 | 11 | 13 | 12 | - |
| Inventory | 26 | 28 | 28 | 31 | 32 | 31 | 29 | - |
| Domestic Consumption | 1,275 | 1,357 | 1,385 | 1,527 | 1,589 | 1,539 | 1,456 | 1,660 |
| Demand Supply Gap | - | - | - | - | - | - | - | -95 |
|  | **FY23** | **FY24** | **FY25** | **FY26** | **FY27** | **FY28** | **FY29** | **FY30** |
| Capacity | 1,814 | 2,111 | 2,588 | 2,588 | 2,588 | 2,588 | 2,588 | 2,588 |
| Production | 1,565 | 1,740 | 1,954 | 2,021 | 2,100 | 2,114 | 2,179 | 2,217 |
| Operating rate (%) | 73% | 67% | 69% | 70% | 71% | 74% | 75% | 77% |
| Import | - | - | - | - | - | - | - | - |
| Export | - | - | - | - | - | - | - | - |
| Inventory | - | - | - | - | - | - | - | - |
| Domestic Consumption | 1,797 | 1,950 | 2,250 | 2,268 | 2,293 | 2,325 | 2,365 | 2,414 |
| Demand Supply Gap | -232 | -210 | -296 | -247 | -193 | -211 | -186 | -198 |

*References: TechSci Analysis, Secondary Sources, Primary Interviews*

Board of Directors, Chambal Fertilizers and Chemicals Ltd (CFCL) has approved the WNA plant at its existing site at Gadepan, Rajasthan. The estimated investment is INR 1,170 Crores for the proposed capacity of 220 KMT of AN and 180KMT of WNA. It will take 36 months for the proposed plant to be operational, conditioned to see the light of implementation shortly. However, no significant development is reported on the implantation level.

CFCL has strong focus on manufacturing Urea and selling surplus Ammonia in the merchant market with significantly very less emphasis on manufacturing ammonium nitrate. In addition, if CFCL enters in AN market, it will have to face tough competition from existing competitors in West India. TechSci understands that it is highly unlikely that CFCL will introduce AN plant

NFL has existing two product streams of WNA, contributing to a total installed capacity of 191,000 MT. Currently, only one stream is functional, producing 84,269 MT. A less possibility exists that NFL may start operating the second stream because it would primarily support the second existing unit of AN, which is unlikely to happen as the plant location is at the disadvantage of proximity from customers.

The management of GNFC has approved a capacity expansion in the existing weak nitric acid plant of 231 KMT from FY2025 onwards, depending on the market conditions.

There is a demand-supply gap observed even when capacity expansions of NFL, Chambal Fertilizer and GNFC is considered.

**Market**

In India, weak nitric acid domestic consumption stood at 1,456 thousand metric tons in FY2021 growing from 1,275 thousand metric tons with a CAGR of 2.2%. The major demand for WNA comes from the ammonium nitrate industry which constitute approximately 39% of overall domestic consumption followed by fertilizers manufacturing with 26% market share. Other consumption sectors are concentrated nitric acid manufacturing, dyes & paints, explosives, nitroaromatics, etc. manufacturing. Owing to the increasing demand for weak nitric acid from end use segments, it is expected that domestic consumption will increase at a CAGR of 4.8% by FY2030F reaching up to 2,414 thousand metric tons.

**Key Region to Focus**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| India Weak Nitric Acid Market, By Region, By Volume (Thousand Metric Tons) | | | | |
| Region | **2015** | **2021** | **2025** | **2030** |
| West | 465 | 543 | 867 | 966 |
| South | 327 | 378 | 590 | 640 |
| East | 297 | 329 | 494 | 514 |
| North | 186 | 207 | 299 | 294 |
| Total | 1,275 | 1,456 | 2,250 | 2,414 |
| India Weak Nitric Acid Market, By Region, By Volume (%) | | | | |
| Region | **2015** | **2021** | **2025** | **2030** |
| West | 36% | 37% | 39% | 40% |
| South | 26% | 26% | 26% | 27% |
| East | 23% | 23% | 22% | 21% |
| North | 15% | 14% | 13% | 12% |
| Total | 100% | 100% | 100% | 100% |

*References: TechSci Analysis, Secondary Sources, Primary Interviews*

|  |  |  |
| --- | --- | --- |
| **Region** | **CAGR (2015-2021)** | **CAGR (2022-2030F)** |
| **West** | **2.6%** | **5.6%** |
| **South** | **2.5%** | **5.0%** |
| **East** | **1.7%** | **4.1%** |
| **North** | **1.7%** | **3.0%** |

It is recommended to target West region from a consumption point of view because of the high demand from the region. The high market demand is because of high ammonium nitrate and fertilizers manufacturing in the region.

Gujarat is the largest manufacturer of fertilizers in India accounting to more than 25% of the total production of nitrogenous as well as phosphatic fertilizers of the country. The state has more than 14% of the India's total installed capacity of fertilizers. West India WNA market is growing from 465 thousand metric tons in FY2015 to 543 thousand metric tons in FY2021 with a CAGR of 2.6% during this period. It is forecasted to grow with a CAGR of 5.6% and reach up to 966 thousand metric tons by FY2030.

Followed by this, it is also recommended to target south region as it is the base for fertilizers manufacturers. Some high fertilizer manufacturing states include Andhra Pradesh, Karnataka, Kerela, Tamil Nadu, etc. The region’s WNA market is growing from 327 thousand metric tons in FY2015 to 378 thousand metric tons in FY2021 with a CAGR of 2.5% during this period. It is forecasted to grow with a CAGR of 5.0% and reach up to 640 thousand metric tons by FY2030.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| India Weak Nitric Acid Market, By Sales, By Volume (Thousand Metric Tons) | | | | |
| Sales | **2015** | **2021** | **2025** | **2030** |
| Captive | 1,066 | 1,225 | 1,923 | 2,074 |
| Merchant | 210 | 231 | 327 | 341 |
| Total | 1,275 | 1,456 | 2,250 | 2,414 |
| India Weak Nitric Acid Market, By Sales, By Volume (%) | | | | |
| Sales | **2015** | **2021** | **2025** | **2030** |
| Captive | 84% | 84% | 85% | 86% |
| Merchant | 16% | 16% | 15% | 14% |
| Total | 100% | 100% | 100% | 100% |

*References: TechSci Analysis, Secondary Sources, Primary Interviews*

The merchant sale of weak nitric acid is about 231 thousand metric tons, contributing to approximately 18% of the total market. Most of the WNA is used by its producers in the vertically integrated production of a wide range of chemical products such as fertilizers, ammonium nitrate, concentrated nitric acid, nitro aromatic compounds, etc. Out of the total demand of weak nitric acid in India, approximately 84% is captive use accounting to 1,225 thousand metric tons of the total domestic consumption.

**Key Consumption Sectors to Focus**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| India Weak Nitric Acid Market, By Consumption Sectors, By Volume (Thousand Metric Tons) | | | | |
| Consumption Sector | **FY15** | **FY21** | **FY25** | **FY30** |
| Ammonium Nitrate | 401 | 525 | 786 | 880 |
| Fertilizers | 385 | 406 | 623 | 647 |
| CNA | 253 | 267 | 465 | 491 |
| Merchant WNA | 210 | 231 | 327 | 341 |
| SNA | 25 | 27 | 50 | 55 |
| Total | 1,275 | 1,456 | 2,250 | 2,414 |
| India Weak Nitric Acid Market, By Consumption Sectors, By Volume (%) | | | | |
| Consumption Sector | **FY15** | **FY21** | **FY25** | **FY30** |
| Ammonium Nitrate | 31% | 36% | 35% | 36% |
| Fertilizers | 30% | 28% | 28% | 27% |
| CNA | 20% | 18% | 21% | 20% |
| Merchant WNA | 16% | 16% | 15% | 14% |
| SNA | 2% | 2% | 2% | 2% |
| Total | 100.0% | 100.0% | 100.0% | 100.0% |

|  |  |  |
| --- | --- | --- |
| **Consumption Sectors** | **CAGR (2015-2021)** | **CAGR (2022-2030F)** |
| **Ammonium Nitrate** | **4.6%** | **4.2%** |
| **Fertilizers** | **0.9%** | **4.8%** |
| **CNA** | **0.9%** | **6.9%** |
| **Merchant WNA** | **1.6%** | **3.4%** |
| **SNA** | **1.3%** | **6.7%** |

*Others include Nitroaromatics, Dyes & Paints, Explosives, etc.*

*References: TechSci Analysis, Secondary Sources, Primary Interviews*

It is recommended to target ammonium nitrate consumption sector because of the high demand from the sector. Weak nitric acid is captively used to manufacture ammonium nitrate which in turn is used in manufacturing explosives. Approximately 36% of the total market is accounted by ammonium nitrate applications. The market is growing from 401 thousand metric tons in FY2015 to 525 thousand metric tons in FY2021 with a CAGR of 4.6% during this period. WNA ammonium nitrate applications market is forecasted to grow with a CAGR of 4.2% and reach up to 880 thousand metric tons by FY2030.

Followed by this, it is recommended to focus on fertilizers consumption sector. Fertilizers end use sectors have close to 28% market share in the total consumption. Weak nitric acid is captively used to manufacture nitrogenous fertilizers. The market is growing from 385 thousand metric tons in FY2015 to 406 thousand metric tons in FY2021 with a CAGR of 0.9% during thisperiod. WNA fertilizers applications market is forecasted to grow with a CAGR of 4.8% and reach up to 647 thousand metric tons by FY2030.

**India Weak Nitric Acid Market, Sales By Company, By Volume (% share) – FY2021**

*Others Include Imports*

*References: TechSci Analysis, Secondary Sources, Primary Interviews, Company Annual Report*

|  |  |
| --- | --- |
| Company | Sales, By Volume (Thousand Metric Tons) |
| National Fertilizers Limited | 64 |
| Gujarat Narmada Valley Fertilizers & Chemicals Ltd. | 62 |
| Deepak Fertilizers and Petrochemicals Limited | 53 |
| Rashtriya Fertilizers and Chemicals Limited | 25 |
| Others | 26 |
| Total | 231 |

**Price**

|  |  |
| --- | --- |
| India Import Average Selling Price of Weak Nitric Acid – CIF Price (INR Per Metric Ton) | |
| Years | **INR/Ton** |
| 2017 | 23, 723 |
| 2021 | 14,010 |
| 2025 | 21,940 |
| 2030 | 24,596 |
| India Export Average Selling Price of Weak Nitric Acid - FOB Price (INR Per Metric Ton) | |
| Years | **INR/Ton** |
| 2015 | 20,693 |
| 2021 | 26,032 |
| 2025 | 25,045 |
| 2030 | 27,231 |
| India Ex-Factory Average Selling Price of Weak Nitric Acid (INR Per Metric Ton) | |
| Years | **INR/Ton** |
| 2015 | 21,237 |
| 2021 | 20,652 |
| 2025 | 25,009 |
| 2030 | 26,893 |

*References: TechSci Analysis, Secondary Sources, Primary Interviews, Ministry of Commerce, DGFT*

*\*DGFT had made entry errors on the public portal for 2015 and 2016. TechSci did not consider these entries for the analysis.*

The price of 33% WNA is INR 10,560 as of October 2021.

**Competitive Business Environment: AN Market**

* DFPCL has maximum installed capacity (44%) and will have a share of 61% by 2030 of India’s total capacity in absence of new plant
* Except for NFL, each manufacturer operates at minimum 70% (two-third operating efficiency and will reach high operating efficiency at a level of 85% (GNFC), 90% (DFPCL), 95% (RCF) by 2030. Capacity Utilization is linked with the proximity of market (Primarily Up to 1000 KM) and market penetration
* DFPCL is only manufacturer of ammonium nitrate in prill/ granule/solid form giving it an advantage of PAN India market coverage as AN Melt has limitation of transportation beyond 1,000 KM
* DFPCL has higher market penetration primarily because of its offerings of ammonium nitrate in prill/ granule/solid form
* DFPL is the only manufacturer of Pharma-grade AN, offering it an added advantage
* Perceived quality of DFPL is high over to other manufactures
* All manufactures have disadvantages to the proximity of eastern region market. New plant DFPCL in Gopalpur, Odisha (East Coast) will offer an advantage
* GNFC, RCF, and NFL produce AN melt as an intermediatory product in the production line of calcium ammonium nitrate as fertilizer industry is their key focus although Deepak Fertilizer has their key focus on AN market
* All manufactures will get benefited as there would always be Demand Supply Gap (Optimistic, Realistic and Pessimistic)
* Export market potential is an added opportunity for all manufacturers
* Increasing Tariff on Imports will always be beneficials for all manufacturers

**Strategic Relevance of Proposed Locations Shahjahanpur Vs Hazira**

**Shahjahanpur: Ammonium Nitrate and Weak Nitric Acid Market Coverage Based on Distance**

**Ammonium Nitrate**

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Ammonium Nitrate: Demand Coverage With Respect to Distance( KM) At Proposed Facility : Shahjahanpur(Volume MT)** | | | | | | | | | | |
| **End-Use** | **%** | **MT** | **0-300** | **301-500** | **501-800** | **801-1000** | **1001-1400** | **1401-1700** | **1701-2000** | **> 2000** |
| Explosive | 8,18,399 | 88% | - | - | 2,72,799 | 2,29,152 | 2,61,887 | 54,559 | - | - |
| Mining | 42,947 | 5% | - | - | 3,767 | 21,044 | 14,473 | 2,920 | 743 | - |
| Commercial & infrastructure | 25,197 | 3% | - | - | 9,070 | 2,268 | 3,275 | 2,016 | 5291 | 3275 |
| Pharmaceuticals | 21,156 | 2% | - | 1,269 | 1,904 | 2,538 | 7,405 | 4,019 | 4019 | - |
| Others | 25,495 | 3% | - | 765 | 1,275 | 3,825 | 5,608 | 6,374 | 7649 | - |
| Domestic Demand MT | 9,33,194 | 100% | - | 2,039 | 2,88,908 | 2,58,842 | 2,92,680 | 69,759 | 17607 | 3359 |
| Domestic Demand Coverage % | | | **0%** | **0.22%** | **31%** | **28%** | 31% | 7% | 2% | 0.4% |

**Total % Demand Coverage Up to 1000 KM: 59%**

**Weak Nitric Acid**

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **End-Use** | **%** | **MT** | **0-300** | **301-500** | **501-800** | **801-1000** | **1001-1400** | **1401-1700** | **1701-2000** | **> 2000** |
| **Fertilizers** | 60% | 1,38,585 | 12,472 | 15,244 | 23,559 | 18,016 | 30,489 | 13,858 | 9,702 | 15,244 |
| **CNA** | 10% | 23,098 | 692 | 5,082 | 6,006 | 1,848 | 3,233 | 2,541 | 2,309 | 1,385 |
| **Others** | 30% | 69,293 | - | 4,157 | 6,237 | 9,700 | 22,868 | 13,165 | 13,165 | - |
| **Domestic Demand** | | 2,30,975 | 13,182 | 24,486 | 35,808 | 29,566 | 56,576 | 29,552 | 25,157 | 16,648 |
| **Domestic Demand Coverage %** | | | **6%** | **11%** | **16%** | **13%** | 24% | 13% | 11% | 7% |

**Total % Demand Coverage Up to 1000 KM: 46%**

**Hazira: Ammonium Nitrate and Weak Nitric Acid Market Coverage Based on Distance**

**Ammonium Nitrate**

|  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Ammonium Nitrate: Demand Coverage With Respect to Distance( KM) At Proposed Facility: Hazira (Volume MT)** | | | | | | | | | | | |
| **End-Use** | | **%** | **MT** | **0-300** | **301-500** | **501-800** | **801-1000** | **1001-1400** | **1401-1700** | **1701-2000** | **> 2000** |
| Explosive | 88% | | 8,18,399 | - | 136,400 | - | 253,703 | 18,823 | 81,840 | - | 327,360 |
| Mining | 5% | | 42,947 | - | 1,657 | - | 6,228 | 8,160 | 9,835 | 16,320 | 742 |
| Commercial & infrastructure | 3% | | 25,197 | 2,016 | 1,008 | 2,520 | 9,323 | 6,048 | 1,008 | - | 3,275 |
| Pharmaceuticals | 2% | | 21,156 | 4,231 | 3,597 | 1,693 | 3,597 | 6,769 | 635 | 423 | 212 |
| Others | 3% | | 25,495 | 4,589 | 3,825 | 1,785 | 4,844 | 7,904 | 1,020 | 510 | 1,020 |
| Domestic Demand MT | | | 9,33,194 | 10,805 | 146,373 | 6,030 | 277,713 | 47,769 | 94,379 | 17,404 | 332,444 |
| Domestic Demand Coverage % | | | | **1%** | **16%** | **1%** | **30%** | 5% | 10% | 2% | 36% |

**Total % Demand Coverage Up to 1000 KM: 48%**

**Weak Nitric Acid**

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Demand Coverage with Respect to Distance (KM) At Proposed Facility: Hazira (Volume MT)** | | | | | | | | | | |
| End-Use | % | Volume | 0-300 | 301-500 | 501-800 | 801-1000 | 1001-1400 | 1401-1700 | 1701-2000 | > 2000 |
| Fertilizers | 60% | 1,38,585 | 29,103 | 13,858 | 18,016 | 20,788 | 18,016 | 9,702 | 5,543 | 23,559 |
| CAN | 10% | 23,098 | 1,848 | 2,541 | 2,309 | 5,774 | 4,850 | 924 | 462 | 4,389 |
| Others | 30% | 69,293 | 22,173 | 11,088 | 5,542 | 6,237 | 13,165 | 4,158 | 1,385 | 5,542 |
| Domestic Demand MT | | 2,30,975 | 53,114 | 27,476 | 25,879 | 32,803 | 36,019 | 14,786 | 7,395 | 33,503 |
| Domestic Demand Coverage % | | | **23%** | **12%** | **11%** | **14%** | 16% | 6% | 3% | 15% |

**Total % Demand Coverage Up to 1000 KM: 60%**

Key demand of Ammonium Nitrate is utilised for the demand for explosives, with Coal India Limited being the largest customer in the country capturing over 64% of the demand generated.

Majority demand for explosives comes from states such as Jharkhand, Odisha, Chhattisgarh, West Bengal, Madhya Pradesh, Telangana, Maharashtra etc.

Jharkhand holds dominating share of 26.06% in demand for explosives, followed by 24.86% of Odisha, 17.93% of Chhattisgarh, 9.93% of West Bengal etc.

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Distance of Coal Reserves in States, KM** | | | | | | | | | | | | | | | |
|  | JH | OD | CH | WB | MP | TE | MH | AP | BR | UP | MY | AS | ND | SK | AL |
| Shahjahanpur | 900 | 1200 | 975 | 1100 | 718 | 1450 | 1270 | 1750 | 740 | 177 | 1600 | 1700 | 1450 | 1230 | 2100 |
| Hazira | 1723 | 1500 | 1125 | 2000 | 830 | 1000 | 470 | 1250 | 1650 | 1250 | 2700 | 2800 | 2300 | 2300 | 3100 |
| Logistic Cost (per metric tonne): Ammonium Nitrate, INR | | | | | | | | | | | | | | | |
| Shahjahanpur | 3350 | 4000 | 3560 | 3850 | 2700 | 4300 | 4800 | 5500 | 2800 | 650 | 5300 | 5500 | 4300 | 4000 | 7000 |
| Hazira | 6000 | 5500 | 4600 | 6950 | 2850 | 3800 | 1500 | 4300 | 5300 | 4000 | 7500 | 7550 | 7150 | 7150 | 8000 |

|  |  |  |  |
| --- | --- | --- | --- |
| States and Abbreviations | | | |
| JHARKHAND | JH | UTTAR PRADESH | UP |
| ODISHA | OD | MEGHALAYA | MY |
| CHHATTISGARH | CH | ASSAM | AS |
| WEST BENGAL | WB | NAGALAND | ND |
| MADHYA PRADESH | MP | SIKKIM | SK |
| TELANGANA | TE | ARUNACHAL PRADESH | AL |
| MAHARASHTRA | MH | ANDHRA PRADESH | AP |
| BIHAR | BR |  |  |

**Distance from JNPT (Only Port Exporting 100% Volume of Ammonium Nitrate)**

|  |  |  |  |
| --- | --- | --- | --- |
| **Suppliers** | **Plant Location** | | **Distance from JNPT** |
| **District** | **State** |
| Client- Plant location 1 | Shahjahanpur | Uttar Pradesh | 1415 |
| Client- Plant location 2 | Hazira | Gujarat | 330 |
| Deepak Fertilizers and Petrochemicals Limited | Taloja | Maharashtra | 37 |
| Deepak Fertilizers and Petrochemicals Limited | Srikakulam | Andhra Pradesh | 1425 |
| Deepak Fertilizers and Petrochemicals Limited | Gopalpur | Odisha (Planned) | 1600 |
| Gujarat Narmada Valley Fertilizers & Chemicals Ltd. | Bharuch | Gujarat | 365 |
| Rashtriya Chemicals and Fertilizers Limited | Nangal | Punjab | 1775 |
| National Fertilizers Limited | Trombay | Maharashtra | 50 |

**Concluding Remarks**

* Overall, the AN market is expected to be approximately double from 933KMT in 2021 to 1814KMT in 2030— growing demand and advantages of ANFO over other Blasting Agents, making it a lucrative market to operate and generate revenues.
* Deepak Fertilizer is a significant competitor as it has dedicated plants to manufacture AN in both forms ( Melt and Granular) for higher market reach.
* A high demand-supply gap exists starting from 105KMT in 2022 and reaching at the level of 597KMT in 2030,considering the new plant of Deepak Fertilizer in east India by 2025.
* Even considering the unlikely scenario, such as an approved plant of Chambal Fertilizer and initiative towards higher capacity utilization of NCF, there is still a significant demand-supply gap to be capitalized by a new player with a planned capacity of 100KMT to operate at least at 50% operating efficiency. However, 2025 is expected to be a challenging year as most of the capacities will get introduced this year.
* All manufactures will be profitable as there would always be a Demand Supply Gap in all scenarios (Optimistic, Pessimistic and Realistic Scenarios, excluding the 2025 (Realistic) and 2025 and 2026( Pessimistic).
* Export market potential is an added opportunity for all manufactures.
* Increasing Tariff on Imports will always be beneficials for all manufactures.

A substantial business opportunity exists, but there would always be a threat of new players entering the market, specifically those companies with the advantage of in-house Ammonia. The early entrant will influence the entry plans of possible another entrant.

Key demand of Ammonium Nitrate is utilized for the demand for explosives—In India overall explosives market, Coal India Limited is the largest customer: over 64% of the demand. In AN based explosives market, Coal India Limited has a share of approximately 80%. Out of the total East India region demand (40%), the primary demand is from states— Jharkhand (26.06%), Odisha (24.86%), Chhattisgarh (17.93%), West Bengal (9.93%)

East India is a strategic location to be tapped. Deepak fertilizer’s new plant will have an early mover advantage.

* Overall, the WNA market is expected to be approximately 66% more, from 1,456 KMT in 2021 to 2,415 KMT in 2030
* Gujarat is the largest manufacturer of fertilizers in India accounting to more than 25% of the total production of nitrogenous as well as phosphatic fertilizers in the country. The state has more than 14% of the India's total installed capacity of fertilizers.
* Most of the WNA is used by its producers in the vertically integrated production of a wide range of chemical products such as fertilizers, ammonium nitrate, concentrated nitric acid, nitro aromatic compounds, etc.
* A high demand-supply gap exists starting from 95KMT in 2022 and reaching at the level of 483KMT in 2030,considering the new plant of Deepak Fertilizer in east India
  + Even considering the unlikely scenario, such as an approved plant of Chambal Fertilizer and GNFC, including the initiative towards higher capacity utilization of NCF, there is still a significant demand-supply gap to be capitalized by a new player with a planned capacity of 200 KMT to operate at least at 50% operating efficiency.
* Export market potential is an added opportunity for all manufactures

A substantial business opportunity exists, but there would always be a threat of new players entering the market, specifically those interested in manufacturing AN and Fertilizers. The early entrant will influence the entry plans of possible another entrant.

* Approximately 13% (231KMT) market belongs to the merchant market.
* Out of 13% merchant market, 35%(81KMT) and 27% (62KMT) is consumed in West and South region respectively. East (22%) and North India (16%) jointly contribute 38% (88KMT)

Although the cumulative merchant market of WNA in the South and East regions stands at 68%, the competitive intensity is very high because all current manufacturers are in the west region. Deepak fertilizer’s new plant will have an early mover advantage, but still, there is no player present in North India.

* In Domestic market, from the coverage point of view, (up to 1,000 KM)
  + Ammonium Nitrate: Shahjahanpur and Hazira cover 59% and 47% demand respectively
  + Weak Nitric Acid: Shahjahanpur and Hazira cover 45% and 60% respectively
* In Exports markets, Hazira has advantage because of the proximity of JNPT port.
* In the case of WNA, the client will always have an advantage in Shahjahanpur because of the absence of WNA manufacturers in North India with competition from only Deepak fertilizer’s new plant in East India.
  + To operate in West and South Regions will become more complicated if the proposed plans of existing players (GNFC, RCF) see the light of implementation. In addition, the situation will become more competitive if Chambal Fertilizer’s plant becomes operational.

**TechSci recommends that the client should set up AN and WNA plants at Shahjahanpur location to have more comprehensive market coverage, get competitive location advantage with an aim to generate additional revenue sources.**

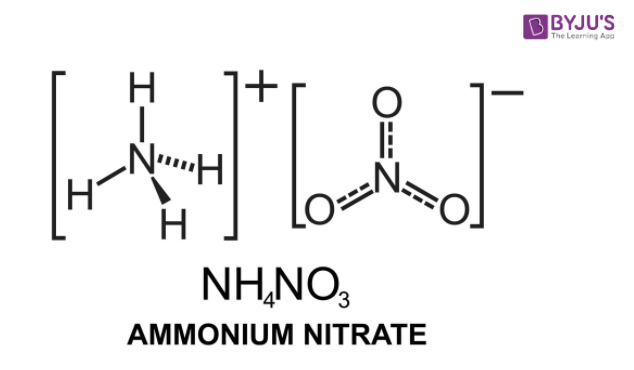
**INDIA AMMONIUM NITRATE MARKET** **AND BUSINESS ENVIRONMENT ASSESSMENT**

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Description automatically generated

**Ammonium Nitrate:**

|  |  |
| --- | --- |
| Chemical Formula | NH4NO3 |
| Molar Mass/ Molecular Weight | 80.043 grams per mole |
| Density | 1.725 grams per cubic centimetre |
| Melting Point | 442.8K (169.6 degree Celsius) |
| Boiling Point | Decomposes at 483K (210 degree Celsius) |



Ammonium nitrate is a white crystalline solid having ammonium, and nitrate ions with a trigonal crystal structure. It has high solubility in water and is hygroscopic as a solid.

**Applications:** Some of the common applications are explosives used in mining quarrying, civil construction, etc., fertilizers. It is a major constituent of ANFO, which an industrial explosive.

It is also used as an absorbent for nitrous oxide, freezing mixtures, oxidizer in rocket propellants, and a nutrient for yeast and antibiotics.

**Production:** Ammonium nitrate is produced by neutralizing ammonia (NH3) with nitric acid (HNO3).

The equation is as follows:

NH3 + HNO3 NH4NO3

Ammonium Nitrate is mainly commercialized in aqueous solution, prills (pellets) and granules.

**India Ammonium Nitrate Market, Installed Capacity, By Volume (Thousand Metric Tons) (FY2015-FY2030)**

**India Ammonium Nitrate Installed Capacity, By Location, By Volume (Thousand MT/Thousand Metric Tons), FY2021**

|  |  |  |
| --- | --- | --- |
| Company | Location | Installed Capacity (Thousand Metric Tons) |
| Deepak Fertilizers and Petrochemicals Limited | Taloja, Maharashtra | 444 |
| Srikakulam, Andhra Pradesh | 43 |
| Gujarat Narmada Fertilizers and Chemicals Limited | Bharuch, Gujarat | 229 |
| Rashtriya Chemicals and Fertilizers Limited | Trombay, Mumbai | 198 |
| National Fertilizers Limited | Nangal, Punjab | 186 |

*References: TechSci Analysis, Secondary Sources, Primary Interviews, Company Annual Reports*

India’s overall ammonium nitrate installed capacity was 1,098 thousand metric tons in FY2015 which increased up to 1,100 thousand metric tons in FY2021. The installed capacity per annum is expected to increase up to 1,587 thousand metric tons by FY2030.

Out of total, Deepak Fertilizers and Petrochemicals Limited has maximum share of approximately 44% followed by Gujarat Narmada Fertilizers and Chemicals Limited with 21%, Rashtriya Chemicals and Fertilizers Limited with 18% and National Fertilizers Limited with 17%. By FY2024F, Deepak Fertilizers and Petrochemicals (DFPCL) is planning to expand its production capacity because of increasing demand in the domestic market. The planned additional capacity is 376 Thousand Metric Tons per annum in Odisha.

The overall ammonium nitrate production in India was 744 thousand metric tons in FY2021. Out of which, Deepak Fertilizers and Petrochemicals Limited has maximum share of approximately 57% followed by Gujarat Narmada Fertilizers and Chemicals Limited, Rashtriya Chemicals and Fertilizers Limited, National Fertilizers Limited.

**India Ammonium Nitrate Market, Production, By Volume (Thousand Metric Tons) (FY2015-FY2030)**

*References: TechSci Analysis, Secondary Sources, Primary Interviews*

**India Ammonium Nitrate Market, Operating Efficiency (%) (FY2015-FY2030)**

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | FY15 | FY16 | FY17 | FY18 | FY19 | FY20 | FY21 | FY22 |
| India Total | **52%** | **56%** | **58%** | **65%** | **76%** | **64%** | **68%** | **73%** |
| DFPCL | 63% | 70% | 72% | 85% | 104% | 91% | 87% | 90% |
| GNFC | 70% | 70% | 70% | 73% | 74% | 45% | 70% | 70% |
| RCF | 51% | 55% | 60% | 65% | 75% | 75% | 75% | 90% |
| NFL | 5% | 5% | 5% | 7% | 7% | 4% | 6% | 6% |
|  | **FY23** | **FY24** | **FY25** | **FY26** | **FY27** | **FY28** | **FY29** | **FY30** |
| India Total | **73%** | **67%** | **69%** | **70%** | **71%** | **74%** | **75%** | **77%** |
| DFPCL | 90% | 73% | 74% | 76% | 78% | 80% | 82% | 84% |
| GNFC | 70% | 70% | 75% | 75% | 75% | 80% | 85% | 85% |
| RCF | 90% | 90% | 90% | 90% | 90% | 95% | 95% | 95% |
| NFL | 6% | 6% | 7% | 7% | 8% | 8% | 8% | 8% |

*References: TechSci Analysis, Secondary Sources, Primary Interviews, Company Annual Reports*

Deepak Fertilizers and Petrochemicals (DFPCL) has the maximum operating efficiency of around 87% followed by Rashtriya Chemicals and Fertilizers Limited with 75%, Gujarat Narmada Fertilizers and Chemicals Limited with 70%.

India’s overall operating efficiency for ammonium nitrate is 68% in FY2021 is forecasted to reach up to 77% in FY2030.

**India Ammonium Nitrate Market, Installed Capacity, By Volume (Thousand Metric Tons) (FY2015-FY2030) - Including NFL & Chambal Scenario**

* Chambal Fertilizers is planning a capacity increment of 220KTPA at Kota, Rajasthan (West Coast) by FY25.
* NFL plans to start a second existing production stream that is at the idle stage.

**India Ammonium Nitrate Market, Production, By Volume (Thousand Metric Tons) (FY2015-FY2030) - Including NFL & Chambal Scenario**

*References: TechSci Analysis, Secondary Sources, Primary Interviews*

**India Ammonium Nitrate Market, Operating Efficiency (%) (FY2015-FY2030) - Including NFL & Chambal Scenario**

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | FY15 | FY16 | FY17 | FY18 | FY19 | FY20 | FY21 | FY22 |
| India Total | **52%** | **56%** | **58%** | **65%** | **76%** | **64%** | **68%** | **73%** |
| DFPCL | 63% | 70% | 72% | 85% | 104% | 91% | 87% | 90% |
| GNFC | 70% | 70% | 70% | 73% | 74% | 45% | 70% | 70% |
| RCF | 51% | 55% | 60% | 65% | 75% | 75% | 75% | 90% |
| NFL | 5% | 5% | 5% | 7% | 7% | 4% | 6% | 6% |
| CFCL | - | - | - | - | - | - | - | - |
|  | **FY23** | **FY24** | **FY25** | **FY26** | **FY27** | **FY28** | **FY29** | **FY30** |
| India Total | **73%** | **68%** | **68%** | **69%** | **71%** | **74%** | **76%** | **78%** |
| DFPCL | 90% | 74% | 74% | 76% | 78% | 80% | 82% | 84% |
| GNFC | 70% | 75% | 75% | 75% | 75% | 80% | 85% | 85% |
| RCF | 90% | 90% | 90% | 90% | 90% | 95% | 95% | 95% |
| NFL | 6% | 22% | 22% | 25% | 26% | 28% | 28% | 28% |
| CFCL | - | - | 50% | 50% | 55% | 60% | 65% | 70% |

*References: TechSci Analysis, Secondary Sources, Primary Interviews, Company Annual Reports*

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| India Ammonium Nitrate Market, Installed Capacity, By Company, By Volume (Metric Tonnes) - Including NFL & Chambal Scenario | | | | | | | | |
|  | **FY15** | **FY16** | **FY17** | **FY18** | **FY19** | **FY20** | **FY21** | **FY22** |
| DFPCL | 485 | 485 | 485 | 485 | 485 | 485 | 487 | 485 |
| GNFC | 229 | 229 | 229 | 229 | 229 | 229 | 229 | 229 |
| RCF | 198 | 198 | 198 | 198 | 198 | 198 | 198 | 198 |
| NFL | 186 | 186 | 186 | 186 | 186 | 186 | 186 | 186 |
| CFCL | - | - | - | - | - | - | - | - |
|  | **FY23** | **FY24** | **FY25** | **FY26** | **FY27** | **FY28** | **FY29** | **FY30** |
| DFPCL | 598 | 598 | 974 | 974 | 974 | 974 | 974 | 974 |
| GNFC | 229 | 229 | 229 | 229 | 229 | 229 | 229 | 229 |
| RCF | 198 | 198 | 198 | 198 | 198 | 198 | 198 | 198 |
| NFL | 186 | 186 | 186 | 186 | 186 | 186 | 186 | 186 |
| CFCL | - | - | - | 220 | 220 | 220 | 220 | 220 |

*References: TechSci Analysis, Secondary Sources, Primary Interviews, Company Annual Reports*

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| India Ammonium Nitrate Market, Production, By Company, By Volume (Metric Tonnes) - Including NFL & Chambal Scenario | | | | | | | | |
|  | FY15 | FY16 | FY17 | FY18 | FY19 | FY20 | FY21 | FY22 |
| DFPCL | 304 | 338 | 349 | 410 | 506 | 440 | 424 | 538 |
| GNFC | 160 | 160 | 160 | 167 | 169 | 103 | 160 | 160 |
| RCF | 102 | 109 | 119 | 129 | 149 | 149 | 149 | 178 |
| NFL | 9 | 9 | 9 | 13 | 13 | 8 | 11 | 11 |
| CFCL | - | - | - | - | - | - | - | - |
|  | **FY23** | **FY24** | **FY25** | **FY26** | **FY27** | **FY28** | **FY29** | **FY30** |
| DFPCL | 538 | 707 | 725 | 744 | 763 | 782 | 801 | **819** |
| GNFC | 160 | 160 | 171 | 171 | 171 | 183 | 194 | 194 |
| RCF | 178 | 178 | 178 | 178 | 178 | 188 | 188 | 188 |
| NFL | 11 | 39 | 41 | 46 | 48 | 52 | 52 | 52 |
| CFCL | - | - | 110 | 110 | 121 | 132 | 143 | 154 |

*References: TechSci Analysis, Secondary Sources, Primary Interviews, Company Annual Reports*

**India Ammonium Nitrate Market, By Volume (Thousand Metric Tons) – Domestic Consumption (Realistic Approach)**

|  |  |
| --- | --- |
| **CAGR FY2015-FY2021** | **CAGR FY2022-FY2030** |
| 6.4% | 7.8% |

*References: TechSci Analysis, Secondary Sources, Primary Interviews*

In India, ammonium nitrate domestic consumption stood at 933 thousand metric tons in FY2021. The major demand for ammonium nitrate comes from the explosive industries which constitute more than 88% of overall domestic consumption. After explosives sector, mining sector is the largest consumer of explosives in the country followed by construction and infrastructure. The major demand for explosives comes from Coal India Limited which has annual consumption of approximately 65% of total India explosives market in India. Owing to the increasing demand for ammonium nitrate from explosive sectors and increasing mining and construction activities in the country, it is expected that domestic consumption of ammonium nitrate will increase at a CAGR of 7.8% by FY2030F.

**India Ammonium Nitrate Market, Demand-Supply Gap, By Volume (Thousand MT) (Realistic Approach)**

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | FY15 | FY16 | FY17 | FY18 | FY19 | FY20 | FY21 | FY22 |
| Capacity | 1,098 | 1,098 | 1,098 | 1,098 | 1,098 | 1,098 | 1,100 | 1,211 |
| Production | 575 | 616 | 637 | 719 | 837 | 700 | 744 | 888 |
| Operating rate (%) | 52% | 56% | 58% | 65% | 76% | 64% | 68% | 73% |
| Import | 90 | 190 | 326 | 220 | 273 | 268 | 218 | - |
| Export | 12 | 22 | 22 | 26 | 31 | 21 | 14 | - |
| Inventory | 11 | 12 | 13 | 14 | 17 | 14 | 15 | - |
| Domestic Consumption | 641 | 771 | 928 | 898 | 1062 | 933 | 933 | 993 |
| Demand Supply Gap | - | - | - | - | - | - | - | -105 |
|  | **FY23** | **FY24** | **FY25** | **FY26** | **FY27** | **FY28** | **FY29** | **FY30** |
| Capacity | 1,211 | 1,587 | 1,587 | 1,587 | 1,587 | 1,587 | 1,587 | 1,587 |
| Production | 888 | 1,056 | 1,088 | 1,107 | 1,127 | 1,168 | 1,198 | 1,217 |
| Operating rate (%) | 73% | 67% | 69% | 70% | 71% | 74% | 75% | 77% |
| Import | - | - | - | - | - | - | - | - |
| Export | - | - | - | - | - | - | - | - |
| Inventory | - | - | - | - | - | - | - | - |
| Domestic Consumption | 1,059 | 1,134 | 1,217 | 1,310 | 1,415 | 1,533 | 1,665 | 1,814 |
| Demand Supply Gap | -172 | -78 | -129 | -204 | -288 | -365 | -467 | -597 |

*References: TechSci Analysis, Secondary Sources, Primary Interviews*

India overall ammonium nitrate market operating efficiency is forecasted to increase up to 77% in FY2030 from 68% in FY2021. As of FY2021, imports stood at 218 thousand metric tons and exports stood at 14 thousand metric tons. Inventory of ammonium nitrate is at 15 thousand metric tons as of FY2021.

The market is estimated to observe a demand-supply gap of 105 thousand metric tons in FY2022 which is forecasted to increase up to 129 thousand metric tons by FY2025 and 597 thousand metric tons by FY2030.

There is a demand supply gap because manufacturers have produced under capacity and the operating efficiency is only at 68%. The domestic industry is not able to compete with the low-priced imports from the other countries.

**India Ammonium Nitrate Market, By Volume (Thousand Metric Tons) – Domestic Consumption (Optimistic Approach)**

|  |  |
| --- | --- |
| **CAGR FY2015-FY2021** | **CAGR FY2022-FY2030** |
| 6.4% | 10.8% |

*References: TechSci Analysis, Secondary Sources, Primary Interviews*

**India Ammonium Nitrate Market, Demand-Supply Gap, By Volume (Thousand MT) (Optimistic Approach)**

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | FY15 | FY16 | FY17 | FY18 | FY19 | FY20 | FY21 | FY22 |
| Capacity | 1,098 | 1,098 | 1,098 | 1,098 | 1,098 | 1,098 | 1,100 | 1,211 |
| Production | 575 | 616 | 637 | 719 | 837 | 700 | 744 | 888 |
| Operating rate (%) | 52% | 56% | 58% | 65% | 76% | 64% | 68% | 73% |
| Import | 90 | 190 | 326 | 220 | 273 | 268 | 218 | - |
| Export | 12 | 22 | 22 | 26 | 31 | 21 | 14 | - |
| Inventory | 11 | 12 | 13 | 14 | 17 | 14 | 15 | - |
| Domestic Consumption | 641 | 771 | 928 | 898 | 1062 | 933 | 933 | 999 |
| Demand Supply Gap | - | - | - | - | - | - | - | -112 |
|  | **FY23** | **FY24** | **FY25** | **FY26** | **FY27** | **FY28** | **FY29** | **FY30** |
| Capacity | 1,211 | 1,587 | 1,587 | 1,587 | 1,587 | 1,587 | 1,587 | 1,587 |
| Production | 888 | 1,056 | 1,088 | 1,107 | 1,127 | 1,168 | 1,198 | 1,217 |
| Operating rate (%) | 73% | 67% | 69% | 70% | 71% | 74% | 75% | 77% |
| Import | - | - | - | - | - | - | - | - |
| Export | - | - | - | - | - | - | - | - |
| Inventory | - | - | - | - | - | - | - | - |
| Domestic Consumption | 1079 | 1318 | 1455 | 1582 | 1725 | 1886 | 2068 | 2275 |
| Demand Supply Gap | -192 | -262 | -367 | -475 | -597 | -718 | -871 | -1059 |

*References: TechSci Analysis, Secondary Sources, Primary Interviews*

**India Ammonium Nitrate Market, By Volume (Thousand Metric Tons) – Domestic Consumption (Pessimistic Approach)**

|  |  |
| --- | --- |
| **CAGR FY2015-FY2021** | **CAGR FY2022-FY2030** |
| 6.4% | 6.4% |

*References: TechSci Analysis, Secondary Sources, Primary Interviews*

**India Ammonium Nitrate Market, Demand-Supply Gap, By Volume (Thousand MT) (Pessimistic Approach)**

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | FY15 | FY16 | FY17 | FY18 | FY19 | FY20 | FY21 | FY22 |
| Capacity | 1,098 | 1,098 | 1,098 | 1,098 | 1,098 | 1,098 | 1,100 | 1,211 |
| Production | 575 | 616 | 637 | 719 | 837 | 700 | 744 | 888 |
| Operating rate (%) | 52% | 56% | 58% | 65% | 76% | 64% | 68% | 73% |
| Import | 90 | 190 | 326 | 220 | 273 | 268 | 218 | - |
| Export | 12 | 22 | 22 | 26 | 31 | 21 | 14 | - |
| Inventory | 11 | 12 | 13 | 14 | 17 | 14 | 15 | - |
| Domestic Consumption | 641 | 771 | 928 | 898 | 1062 | 933 | 933 | 980 |
| Demand Supply Gap | - | - | - | - | - | - | - | -92 |
|  | **FY23** | **FY24** | **FY25** | **FY26** | **FY27** | **FY28** | **FY29** | **FY30** |
| Capacity | 1,211 | 1,587 | 1,587 | 1,587 | 1,587 | 1,587 | 1,587 | 1,587 |
| Production | 888 | 1,056 | 1,088 | 1,107 | 1,127 | 1,168 | 1,198 | 1,217 |
| Operating rate (%) | 73% | 67% | 69% | 70% | 71% | 74% | 75% | 77% |
| Import | - | - | - | - | - | - | - | - |
| Export | - | - | - | - | - | - | - | - |
| Inventory | - | - | - | - | - | - | - | - |
| Domestic Consumption | 1,032 | 1,090 | 1,155 | 1,228 | 1,309 | 1,399 | 1,501 | 1,614 |
| Demand Supply Gap | -144 | -34 | -67 | -121 | -181 | -232 | -303 | -397 |

*References: TechSci Analysis, Secondary Sources, Primary Interviews*

Even while considering the pessimistic approach, taking the forecast CAGR of 6.6% there is still a significant demand supply gap of 144 thousand metric tons in FY23 and so a scope for the client to operate in the market.

**India Ammonium Nitrate Market, Demand-Supply Gap, By Volume (Thousand MT) (Including NFL & Chambal Scenario)**

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | FY15 | FY16 | FY17 | FY18 | FY19 | FY20 | FY21 | FY22 |
| Capacity | 1,098 | 1,098 | 1,098 | 1,098 | 1,098 | 1,098 | 1,100 | 1,211 |
| Production | 575 | 616 | 637 | 719 | 837 | 700 | 744 | 888 |
| Operating rate (%) | 52% | 56% | 58% | 65% | 76% | 64% | 68% | 73% |
| Import | 90 | 190 | 326 | 220 | 273 | 268 | 218 | - |
| Export | 12 | 22 | 22 | 26 | 31 | 21 | 14 | - |
| Inventory | 11 | 12 | 13 | 14 | 17 | 14 | 15 | - |
|  | **FY23** | **FY24** | **FY25** | **FY26** | **FY27** | **FY28** | **FY29** | **FY30** |
| Capacity | 1,211 | 1,587 | 1,807 | 1,807 | 1,807 | 1,807 | 1,807 | 1,807 |
| Production | 888 | 1,084 | 1,226 | 1,249 | 1,281 | 1,337 | 1,378 | 1,408 |
| Operating rate (%) | 73% | 68% | 68% | 69% | 71% | 74% | 76% | 78% |
| Import | - | - | - | - | - | - | - | - |
| Export | - | - | - | - | - | - | - | - |
| Inventory | - | - | - | - | - | - | - | - |

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| ***Demand at CAGR 7.8%*** | 641 | 771 | 928 | 898 | 1,062 | 933 | 933 | 993 | 1,059 | 1,134 | 1,217 | 1,310 | 1,415 | 1,533 | 1,665 | 1,814 |
| ***Demand -Supply Gap*** | - | - | - | - | - | - | - | -105 | -172 | -50 | 9 | -61 | -134 | -196 | -287 | -406 |

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| ***Demand at CAGR 10.8%*** | 641 | 771 | 928 | 898 | 1062 | 933 | 933 | 999 | 1,079 | 1,318 | 1,455 | 1,582 | 1,725 | 1,886 | 2,068 | 2,275 |
| ***Demand -Supply Gap*** | - | - | - | - | - | - | - | -112 | -192 | -234 | -229 | -332 | -443 | -549 | -690 | -867 |

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Demand at CAGR 6.4%** | 641 | 771 | 928 | 898 | 1062 | 933 | 933 | 980 | 1,032 | 1,090 | 1,155 | 1,228 | 1,309 | 1,399 | 1,501 | 1,614 |
| **Demand -Supply Gap** | - | - | - | - | - | - | - | -92 | -144 | -6 | 71 | 22 | -28 | -62 | -122 | -206 |

*References: TechSci Analysis, Secondary Sources, Primary Interviews*

Board of Directors, Chambal Fertilizers and Chemicals Ltd (CFCL) has approved the WNA plant at its existing site at Gadepan, Rajasthan. The estimated investment is INR 1,170 Crores for the proposed capacity of 220 KMT of AN and 180KMT of WNA. It will take 36 months for the proposed plant to be operational, conditioned to see the light of implementation shortly. However, no significant development is reported on the implantation level

CFCL has strong focus on manufacturing Urea and selling surplus Ammonia in the merchant market with significantly very less emphasis on manufacturing ammonium nitrate. In addition, if CFCL enters in AN market, it will have to face tough competition from existing competitors in West India. TechSci understands that it is highly unlikely that CFCL will introduce AN plant

NFL has existing two product streams of AN, contributing to a total installed capacity of 1,86,384 MT. Currently, only one stream is functional, producing 11,183 MT. A less possibility exists that The NFL may start operating the second stream which is unlikely to happen as the plant location is at the disadvantage of proximity from customers.

Even considering the above unlikely scenario, there is still a significant demand-supply gap to be capitalized by a new player. However, 2025 is expected to be a challenging year as most of the capacities will get introduced this year.

**India Ammonium Nitrate Market, Installed Capacity, By Company (Thousand Metric Tons) (FY2021)**

|  |  |
| --- | --- |
| By Company, By Volume (Thousand Metric Tons) | FY2021 |
| **Deepak Fertilizers and Petrochemicals Limited** | 487 |
| **Gujarat Narmada Fertilizers & Chemicals Ltd.** | 229 |
| **Rashtriya Chemicals and Fertilizers Limited** | 198 |
| **National Fertilizers Limited** | 186 |

*References: TechSci Analysis, Secondary Sources, Primary Interviews, Company Annual Reports*

Deepak Fertilizers and Petrochemicals Limited has the highest installed capacity of 487 thousand metric tons in FY 2021 with a share of 44%. DFPCL is followed by GNFC with an installed capacity of 229 thousand metric tons per annum and a share of 21%. RCF and NFL has 18% and 17% share respectively.

**India Ammonium Nitrate Market, Production, By Company (Thousand Metric Tons) (FY2021)**

Deepak Fertilizers and Petrochemicals Limited has the highest production of 424 thousand metric tons in FY 2021 with a share of 57%. DFPCL is followed by GNFC with production of 160 thousand metric tons per annum and a share of 22%. RCF and NFL has 20% and 2% share respectively.

|  |  |
| --- | --- |
| By Company, By Volume (Thousand Metric Tons) | FY2021 |
| **Deepak Fertilizers and Petrochemicals Limited** | 424 |
| **Gujarat Narmada Valley Fertilizers & Chemicals Ltd.** | 160 |
| **Rashtriya Chemicals and Fertilizers Limited** | 149 |
| **National Fertilizers Limited** | 11 |

*References: TechSci Analysis, Secondary Sources, Primary Interviews, Company Annual Reports*

**India Ammonium Nitrate Market, Merchant Sales, By Company (Thousand Metric Tons) (FY2021)**

|  |  |
| --- | --- |
| By Company, By Volume (Thousand Metric Tons) | FY2021 |
| **Deepak Fertilizers and Petrochemicals Limited** | 428 |
| **Gujarat Narmada Valley Fertilizers & Chemicals Ltd.** | 159 |
| **Rashtriya Chemicals and Fertilizers Limited** | 140 |
| **National Fertilizers Limited** | 9 |
| **Others (Imports)** | 198 |

*References: TechSci Analysis, Secondary Sources, Primary Interviews, Company Annual Reports*

In India Ammonium Nitrate Market, Deepak Fertilizers and Petrochemicals Limited has a maximum share of 45% in FY2021 with sales volume of 428 thousand metric tons. After DFPCL, Gujarat Narmada Fertilizer Chemical Limited is the market leader with a share of approximately 17% with sales volume of 159 thousand metric tons followed by Rashtriya Fertilizers Limited, National Fertilizers Limited, etc.

**India Ammonium Nitrate Market, By Product Type, By Volume (Thousand Metric Tons)**

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| India Ammonium Nitrate Market, By Product Type, By Volume (Thousand Metric Tons) | | | | | | | | | | | | | | | |
|  | **FY15** | | **FY16** | | **FY17** | | | **FY18** | | **FY19** | | **FY20** | | **FY21** | |
| HDAN | 336 | | 402 | | 482 | | | 465 | | 548 | | 480 | | 478 | |
| AN Melt | 270 | | 326 | | 393 | | | 381 | | 452 | | 398 | | 399 | |
| LDAN | 35 | | 43 | | 53 | | | 52 | | 62 | | 55 | | 56 | |
|  | **FY22** | **FY23** | | **FY24** | | **FY25** | **FY26** | | **FY27** | | **FY28** | | **FY29** | | **FY30** |
| HDAN | 539 | 575 | | 616 | | 661 | 711 | | 768 | | 831 | | 902 | | 539 |
| AN Melt | 455 | 488 | | 525 | | 566 | 613 | | 665 | | 724 | | 790 | | 455 |
| LDAN | 65 | 71 | | 77 | | 84 | 91 | | 100 | | 110 | | 122 | | 65 |

|  |  |  |
| --- | --- | --- |
| **Product Type** | **CAGR FY2015-FY2021** | **CAGR FY2022-FY2030** |
| **HDAN** | 6.1% | 7.5% |
| **AN Melt** | 6.7% | 8.0% |
| **LDAN** | 8.0% | 9.2% |

*References: TechSci Analysis, Secondary Sources, Primary Interviews*

**2.1 Ammonium Nitrate Applications Market**

**India Ammonium Nitrate Explosives Applications Market, By Volume (Thousand Metric Tons)**

|  |  |
| --- | --- |
| **CAGR FY2015-FY2021** | **CAGR FY2022-FY2030** |
| 6.4% | 7.8% |

*References: TechSci Analysis, Secondary Sources, Primary Interviews*

In FY2021, ammonium nitrate consumption in explosive industry stood at 818 thousand metric tons. Major consumers of ammonium nitrate in explosives industry are Solar Industries India, IDL Explosives, Special Blast Pvt. Ltd., and IOCL. Solar Industries India has a share of approximately 28%-30% in overall India explosive market. Recently, Solar Industries India received order worth INR 1,471 crores from Coal India Limited to supply bulk explosives over a period of two years.

India’s growing explosives market is one of the major drivers for this segment. The India explosives market has been growing significantly with a CAGR of 8.1% between FY2016-FY2022. The market has been growing on the back of demand from mining, construction, and road & infrastructure industry. The blasting agent segment is anticipated to grow and maintain dominance in forecast period.

**India Ammonium Nitrate Mining Applications Market, By Volume (Thousand Metric Tons)**

|  |  |
| --- | --- |
| **CAGR FY2015-FY2021** | **CAGR FY2022-FY2030** |
| 6.1% | 7.7% |

*References: TechSci Analysis, Secondary Sources, Primary Interviews*

The total ammonium nitrate consumption in mining sector stood at 43 thousand metric tons in FY2021. Ammonium nitrate is widely used as an explosive in mining sector which increases the demand for ammonium nitrate in the country. The market is growing on the back ofdemand from India mining industry. The coal mining industry is expected to grow because Government of India is expecting to achieve 1 billion tons of coal production by FY 2024 reaching up to 2 billion tons by 2030.

**India Ammonium Nitrate Commercial & Infrastructure Applications Market, By Volume (Thousand Metric Tons)**

|  |  |
| --- | --- |
| **CAGR FY2015-FY2021** | **CAGR FY2022-FY2030** |
| 6.9% | 8.1% |

*References: TechSci Analysis, Secondary Sources, Primary Interviews*

The overall ammonium nitrate consumption in construction and infrastructure sector stood at 25 thousand metric tons in FY2021. Ammonium nitrate is widely used as an explosive in construction and infrastructure and there is significant demand from cement industry as well in India which increases the overall demand of ammonium nitrate in the country.

**India Ammonium Nitrate Pharmaceuticals Applications Market, By Volume (Thousand Metric Tons)**

|  |  |
| --- | --- |
| **CAGR FY2015-FY2021** | **CAGR FY2022-FY2030** |
| 6.6% | 8.0% |

*References: TechSci Analysis, Secondary Sources, Primary Interviews*

Ammonium nitrate consumption in pharmaceutical stood at 21 thousand metric tons in FY2021. Pharmaceutical grade ammonium nitrate is indigenously produced, and it is not imported. Hence the domestic demand for ammonium nitrate is increasing at a significant rate. The major companies using ammonium nitrate for pharmaceutical application are INOX, Linde and Satram Gases.

AN is used for manufacturing nitrous oxide and anaesthesia gas which is used in pharmaceuticals.

**India Ammonium Nitrate Other Applications Market, By Volume (Thousand Metric Tons)**

|  |  |
| --- | --- |
| **CAGR FY2015-FY2021** | **CAGR FY2022-FY2030** |
| 6.6% | 7.4% |

*References: TechSci Analysis, Secondary Sources, Primary Interviews*

*Other ammonium nitrate applications include* *Freezing Mixtures, Rocket Propellants, Paints, Plastics, etc.*

India ammonium nitrate other applications market is growing from 17 thousand metric tons in FY2015 to 25 thousand metric tons in FY2021 with a CAGR of 6.6% during this period. India ammonium nitrate other applications market is forecasted to grow with a CAGR of 7.4% and reach up to 48 thousand metric tons by FY2030.

**2.2 Ammonium Nitrate Region Market**

**East India Ammonium Nitrate Market, By Volume (Thousand Metric Tons)**

|  |  |
| --- | --- |
| **CAGR FY2015-FY2021** | **CAGR FY2022-FY2030** |
| 7.4% | 8.6% |

*References: TechSci Analysis, Secondary Sources, Primary Interviews*

East India is the major demand generating region for ammonium nitrate in India as the market stood at 375 thousand metric tons in FY2021 which is 40% of total India ammonium nitrate market. The mines present in Jharkhand, Odisha, West Bengal etc. are some of the leading consumers generating demand for ammonium nitrate explosives in India.

**West India Ammonium Nitrate Market, By Volume (Thousand Metric Tons)**

|  |  |
| --- | --- |
| **CAGR FY2015-FY2021** | **CAGR FY2022-FY2030** |
| 7.0% | 8.2% |

*References: TechSci Analysis, Secondary Sources, Primary Interviews*

West India contributes to close to 30% of the total market demand of India ammonium nitrate market. The region’s AN market is growing from 183 thousand metric tons in FY2015 to 276 thousand metric tons in FY2021 with a CAGR of 7.0% during this period. It is forecasted to grow with a CAGR of 8.2% and reach up to 553 thousand metric tons by FY2030.

The region’s ammonium nitrate consumption is growing because of the presence of several explosives manufacturers in West India, who use AN to manufacture ANFO or other emulsion explosives.

**South India Ammonium Nitrate Market, By Volume (Thousand Metric Tons)**

|  |  |
| --- | --- |
| **CAGR FY2015-FY2021** | **CAGR FY2022-FY2030** |
| 5.6% | 7.3% |

*References: TechSci Analysis, Secondary Sources, Primary Interviews*

South India’s contribution to the India ammonium nitrate market is close to 20%. The region’s AN market is growing from 137 thousand metric tons in FY2015 to 191 thousand metric tons in FY2021 with a CAGR of 5.6% during this period. It is forecasted to grow with a CAGR of 7.3% and reach up to 354 thousand metric tons by FY2030.

**North India Ammonium Nitrate Market, By Volume (Thousand Metric Tons)**

|  |  |
| --- | --- |
| **CAGR FY2015-FY2021** | **CAGR FY2022-FY2030** |
| 3.1% | 4.0% |

*References: TechSci Analysis, Secondary Sources, Primary Interviews*

North India contributes to around 10% of the total market demand of India ammonium nitrate market. The region’s AN market is growing from 77 thousand metric tons in FY2015 to 92 thousand metric tons in FY2021 with a CAGR of 3.1% during this period. It is forecasted to grow with a CAGR of 4.0% and reach up to 131 thousand metric tons by FY2030.

**2.3 Demand and Supply Drivers**

**Demand Drivers**

**Growing Demand and Advantages of ANFO Over Other Blasting Agents:**

The introduction of Ammonium Nitrate Fuel Oil (ANFO) as a blasting agent substitute for conventional emulsion explosives is expected to increase the demand for ammonium nitrate which is used in the manufacturing of ANFO.

ANFO is most widely used explosives in the mining industry over other emulsion explosives in the market because of its uncomplicated manufacturing technology, small number of its components, and low production costs compared to EEs.

Ammonium nitrate is used as a component of many explosives, such as ANNM, amatols, and ammonals. However, ANFO explosives are relatively safe while maintaining the properties similar to other emulsion explosives.

Owing to its comparatively lower cost, productivity improvement, better fragmentation and low column charge, as compared to conventional explosives, ANFO consumption has grown significantly in India and all over the world in last few years.

The introduction of new ANFO manufacturing plants is also expected to increase the market demand for ammonium nitrate.

For example, Sasan Power Limited (SPL), a wholly owned subsidiary of Reliance Power Limited, operates 6x660 MW Sasan Ultra Mega Power Project (Sasan UMPP), an integrated captive coal mine Moher & Moher Almori Extension (M&MAE) located in Singrauli District, Madhya Pradesh.

Drilling and blasting using explosives is an integral part of the coal mining at M&MAE. Previously, explosives were procured locally, but to achieve self-reliance, in March 2019, the company announced the plan to use Ammonium Nitrate Fuel Oil (ANFO) in the mines for blasting. For ANFO manufacturing, the company has setup an AN store house of 1,000 metric tons capacity initially. ANFO would be prepared offsite by mechanical mixing of AN and Fuel Oil in specially designed BDS and delivered in the mines. SPL’s total requirement of explosives is 50,000 MT per annum. ANFO manufacturing is expected to meet this demand. The ammonium nitrate composition in ANFO would be close to 95% out of the total ANFO.

**Acute Shortage of Explosives in Mines and Rising Demand from Coal India Ltd.:**

Coal India Ltd. (CIL) has been facing acute shortage of explosives at Eastern Coalfields, Bharat Coking Coal and Mahanadi Coalfields, while others are also seeing lesser supplies.

CIL on an average buy explosives worth INR 2,000 Crores annually and even the company’s smaller subsidiaries such as Eastern Coalfields Limited (ECL) receive 45 to 50 ammonium nitrate loaded tankers a day.

As a result of the Beirut explosions, regulations such as Ammonium Nitrate Rules have become more stringent leading to a scarcity of AN at mines in India. Currently, the Western Coalfields Limited (WCL) has suffered the worst due to halt in supply and is running at a shortage of 53.58%. It requires 321 MT of ammonium nitrate per day. Similarly, ECL requires 203 MT of ammonium nitrate per day, and currently possess 123 MT, facing a shortage of 39.41%. Bharat Coking Coal Limited (BCCL) is the only subsidiary which hasn’t recorded any shortage yet. It has a requirement of 197.5 MT of ammonium nitrate per day.

This shortage leads to increasing demand of ammonium nitrate in the explosives industry.

In addition to this, CIL has also signed supply agreements with several companies to support the demand from the mines.

As of October 2021, Solar Industries India (domestic manufacturer and supplier of bulk and cartridge explosives) received orders worth INR 1,471 crore from Coal India (CIL) to supply bulk explosives over a period of two years.

CIL has also signed procurement agreement with of worth INR 592.45 crore with GOCL Corporation through its wholly owned subsidiary IDL Explosives (IDLEL). The order is for supply of bulk explosives over a period of 2 years.

CIL also procures from IOCL (IBP). Additionally, with respect to RCF’s ammonium nitrate plant capacity expansion CIL has sent a letter (Ref. no. ‘CIL/CH/1729’ dated 01.02.2021) to the company mentioning that it assures market availability for consumption of substantial quantity of AN through IOCL (IBP), who have a long-term Agreement with CIL.

**Increase in Demand from End Use Segments:**

The India explosives market has been growing significantly with a CAGR of 8.1% between FY2016-FY2022. The market has been growing on the back of demand from mining, construction, and road &infrastructure industry. The blasting agent segment is anticipated to grow and maintain dominance in forecast period.

**Mining:** India is world’s second largest coal-producing nation and explosives are widely used for coal mining. Coal production at Coal India was 596.08 million tons in FY 2021 and 64.04 million tons at Singareni Collieries (SCCL). For FY 2022, Coal India has set a target of 670 million tons of coal production. SCCL plans to achieve 70.3 million tons of coal production. The total coal production in India was at 716 million tons in FY 2021 as compared to 736 million ton in FY 2020. The private and captive coal mines produced 70 million tons and 69.6 million tons, respectively in FY2020.

Additionally, Coal India has also approved 32 projects out of which 24 are expansions of existing mines and 8 are greenfield projects worth INR 47,000 Crore which would add 81 million tons coal production per annum.

The Government of India is expecting to achieve 1 billion tons of coal production by FY 2024 reaching up to 2 billion tons by 2030.

India imported 211 million tons of coal in FY2021 as compared to 248.56 million tons in FY2020.

The government aims to further increase coal production in India to reduce the import bill and harness the potential of Indian resources. Increase coal production in turn is expected to bolster the market for mining explosives.

Steel & Iron Ore Mining:InFY2020, the total crude steel production in India stood at 115.5 million tons, making India the second largest producer in the world. The steel industry is expected to achieve production of 300 million tons by FY2030 under National Steel Policy of India.

Cement & Limestone: India accounts to more than 7% of the installed capacity of global cement industry. In FY2021, India’s cement production was 292.2 million tons which is projected to reach up to 550-600 million tons per annum by 2025. The industry is driven by growing commercial and industrial construction leading to increased limestone mining where explosives are used for limestone production.

**Construction:** In FY 2022, the construction industry is expected to recover from the Covid-impact due to a lower base and pent-up demand. The industry is also growing because of the schemes such as National Infrastructure Pipeline (NIP) and the newly announced Affordable Rental Housing Complex (ARHC) scheme.

Housing construction sector, falling under construction industry is the major consumer of cement, steel, and stone aggregate. The sector is growing on the back of increasing income levels of a huge population base, and rapid urbanization. The central government’s scheme Pradhan Mantri Awas Yojana aims to provide housing in both urban and rural areas by FY2022.

Affordable Rental Housing Complex (ARHC) launched under Pradhan Mantri Awas Yojana aims to provide the migrant workers and the urban poor with affordable rental accommodation and enhance their standard of living. As per the PMAY – Urban, 80.2 lakhs houses have been grounded in FY2021 and 48 lakh houses have been constructed out of the planned 112.95 lakh sanctioned houses. As per PMAY – Gramin, 136 lakh houses have been completed by the end of fiscal FY21. Additionally, to boost the demand from housing sector, tax concessions have been provided in FY21 which are set to continue in FY22.

The demand for input raw materials in housing results in increasing demand of iron ore, limestone, stone quarries, etc. and consequently ammonium nitrate explosive.

**Road & Infrastructure:** The demand in infrastructure market is expected to reach more than INR 50 trillion by FY 2022. Centered on the Hybrid Annuity Model (HAM), the Government of India has initiated more than 60 infrastructure highway projects worth USD 10 billion. To improve the highway network in India, the Government of India has launched the Bharatmala Pariyojana, which is aiming to construct 66,100 km of highways, border and coastal routes and expressways. As of March 2021, total National Highways completed are 1,37,635 km and an estimate of 200,000 km is to be completed in next five years.

Additionally, the Ministry of Roads and Highways has set a target of 14600 km of Highway construction for FY22. Under the PMGSY, the total Gram Sadak completed amounted to 162381 km.

Other end use segments such as pharmaceuticals, freezing mixtures, rocket propellants, paints, plastics, etc. are also major drivers of India ammonium nitrate market. AN is used for manufacturing nitrous oxide and anaesthesia gas which is used in pharmaceuticals.

**Supply Drivers**

**Government Regulations:**

Manufacturers across India are seeking to de-risk their supply chains and reduce the dependency on China considering the Government’s Atmanirbhar Bharat.

The Government of India is promoting indigenous production of ammonium nitrate and weak nitric acid to lessen the dependency on Imports through its Atmanirbhar Bharat initiative. Additionally, the GOI has also introduced schemes such as PLI scheme, 100% FDI, mandatory BIS standards, PCPIR policy, National Mineral Policy, etc to ramp up the domestic production of ammonium nitrate and weak nitric acid.

The Union Cabinet chaired by the Prime Minister, Shri Narendra Modi has approved to introduce the production-linked incentive (PLI) scheme in specialty steel with a financial outlay of INR 6,322 Crores for enhancing India’s manufacturing capabilities and enhancing exports, thus increasing demand for industrial explosives.

100% FDI is allowed under the automatic route in the Chemical industry, except in the case of hazardous chemicals and mining industry leading to increased production.

The GOI has announced the National Mineral Policy 2019 and the Mines and Minerals (Development and Regulation) Amendment Act 2021 in order to uncover a huge mining potential in India and presenting major opportunities for investments in mining sector.

The Government of India has conceptualized PCPIRs (Petroleum, Chemicals and Petrochemical Investment Regions) as clusters that provide investors with a transparent and investment-friendly policy and facility regime. PCPIRs are set up with an intention to increase investments in Chemical sector.

All these policies in turn creates an increased demand for industrial explosives used for blasting applicating in the mines.

Each PCPIR is a specifically delineated region spread over an area of about 250 sq. km. These areas will have manufacturing facilities, along with associated logistics and other services. The required infrastructure along with a non-processing area will be developed, to include residential, commercial and other social and institutional infrastructure. The Ministry of Chemicals & Petrochemicals has set up four PCPIRs in Dahej (Gujarat), Vishakhapatnam-Kakinada (Andhra Pradesh), Paradeep (Odisha), and Cuddalore and Nagapattinam (Tamil Nadu). This has a potential to increase chemicals production in India which would in turn increase the demand for weak nitric acid in India

**Anti-Dumping Duty Imposed on Ammonium Nitrate & Initiative to Decrease Dependency on Imports:**

The Government of India has imposed an anti-dumping duty on the imports of ammonium nitrate originating from Russia, Georgia, Indonesia, and Iran. This was done to rectify the dumping of ammonium nitrate in India at lesser price.

The GOI is also promoting initiatives to lessen the dependency on imports and increase domestic production through Atmanirbhar Bharat.

Both these initiatives coupled together act as a supply driver for the domestic manufacturers to meet the growing demand of AN from several sectors such as Explosives, Mining, Construction & Infrastructure, etc.

Additionally, certain product grades such as pharmaceutical grade ammonium nitrate cannot be imported as high purity ammonium nitrate is required to manufacture it. This acts as a supply driver for domestic manufacturers producing pharmaceutical grade ammonium nitrate.

**Shortage of AN due to stored product at different ports:**

The Beirut Ammonium Nitrate explosion in August 2020 led to the storage of a large amount of AN at the Visakhapatnam port. As a result of the explosion, a merchant vessel MV Kraszewski which had reached Visakhapatnam port in the middle of August carrying 20,041 MT of Ammonium Nitrate was stranded. The district authorities suspended berthing of the vessel and ordered that cargo wouldn’t be handled until the concerned government departments give clearance. Before the arrival of Kraszewski, the Vishakhapatnam port was already burdened with 18,000 MT of Ammonium Nitrate. After Kraszewski, four more ships were stopped at the port carrying 60,000 MT of Ammonium Nitrate.

This accumulation of ammonium nitrate at port and halt in supply, the coal mines had a shortage of explosives. This disruption in imports and supply is one of the major supply drivers for domestic manufacturers to increase their production and installed capacity in the coming years.

**2.4 Covid Impact**

The Ammonium Nitrate demand was impacted in the first half of FY2021 due to covid-19 pandemic because of shutting down of operations from several industries such as limestone mines and cement production, quarrying operations, etc. The demand started to recover in the second half of FY2021because of easing of lockdown related restrictions and restart of industrial activity in H2 FY21.

The demand of ammonium nitrate from Limestone and Iron Ore segments remained under stress throughout FY21owing to the decline in cement and steel production in India in FY2021 as compared to FY2020. AN demand from infrastructure segment was majorly affected due to lack of labor availability and liquidity crunch felt across this segment.

**2.5 Major Consumers of Ammonium Nitrate**

|  |  |
| --- | --- |
| Consumers | Consumption By Volume, FY2021 |
| Coal India Ltd. | 700,000 |
| Solar Industries India | 16,000 |
| IBP (linked with IOCL) | 8,000 |
| IDL Explosives (IDLEL) - Hinduja Group | 4,400 |
| INOX | 7,000 |

*References: TechSci Analysis, Secondary Sources, Primary Interviews*

Consumption of Solar Industries India, IBP (linked with IOCL), IDL Explosives (IDLEL) - Hinduja Group is excluding the procurement through CIL.

**Practices Involved in the Industry Related to Consumption of POI (Taking CIL As reference)**

1. The company directly procures ammonium nitrate from manufacturers such as RCF, GNFC, etc. and uses it as explosives.
2. It procures ammonium nitrate from manufacturers and distributes it to explosives manufacturers who then supply emulsion explosives back to CIL.
3. Explosives manufacturers such as Solar Industries India, IBC (linked with IOCL), IDL Explosives (IDLEL) - Hinduja Group, etc. procures ammonium nitrate from the POI manufacturers, develop the emulsion explosives and the supply it to companies such as CIL.

Other customers like CIL also follow similar patterns. Some other consumers include Special Blast Pvt. Ltd., Singareni Coal Company Limited, Linde India Limited, Satram Gases, Steel Authority of India Limited, Sasan Power Limited (Reliance Power Limited), etc.

**2.6 Product Movement Practices & Supply-Chain Analysis**

**Ammonium Nitrate Product Movement Practices**

* Ammonium nitrate is manufactured in three forms namely low density ammonium nitrate (LDAN), high density ammonium nitrate (HDAN), and ammonium nitrate melt (AN melt).
* LDAN and HDAN have lesser logistic cost as these are easier to transport. LDAN and HDAN are transported in HDPE bags. They are transported in 25 kg ,50 kg ,100kg, 1000 kg and1200 kg bags. The bags are made of laminated HDPE woven fabric with inner liners made of LDPE. The bags are packed after thermal heat sealing of liners and stitched with HDPE which provides protection from weather and handling in transportation, sustaining its Quality. LDAN and HDAN can be transported for more than 1000 km without any technical issues. The transportation cost for these grades is 2.5-3 INR per ton per km. Ideally, these products are moved in 50 kg bags in truck with truck capacity of 30 MT. LDAN and HDAN are imported in jumbo packs of 1 MT each.
* AN melt has technical and transportation issues as it can neither be transported to more than 1000 km nor be imported. Domestically AN melt is transported in insulated tankers which are preheated at 120 degrees Celsius. These trucks have capacity of 25-35 MT. Since there is a transportation limitation, GNFC uses converter companies who convert AN melt into HDAN and then transport it to explosives manufacturers at longer distance. For 1000 km, transportation cost of AN melt is 3,500-4,000 INR per MT.

|  |  |  |  |
| --- | --- | --- | --- |
| LDAN/HDAN | | | |
| Distance (KM) | **Capacity (MT)** | **Per Km Per MT (INR)** | **Final Price Per Truck (INR)** |
| 100 | 25 | 3.60 | 9,000 |
| 200 | 25 | 3.40 | 17,000 |
| 300 | 25 | 3.25 | 24,375 |
| 400 | 25 | 3.10 | 31,000 |
| 500 | 25 | 3.00 | 37,500 |
| AN Melt | | | |
| Distance (KM) | **Capacity (MT)** | **Per Km Per MT (INR)** | **Final Price Per Tanker (INR)** |
| 100 | 25 | 5.00 | 12,500 |
| 200 | 25 | 4.75 | 23,750 |
| 300 | 25 | 4.50 | 33,750 |
| 400 | 25 | 4.30 | 43,000 |
| 500 | 25 | 4.20 | 52,500 |

*References: TechSci Analysis, Primary Interviews*

* In case of overseas transportation, lack of designated containers is a major challenge.
* In case of transportation in India, licenses are required. Licenses include P3 for sales, P1 to manufacture, and P4 from PESO (required by both seller and manufacturer for transportation).
* Ammonium Nitrate is transported either in bags or in tankers (in case of AN melt).
* Transportation requirements include 5kg extinguishers, tar coal tied and sealed bags, one driver and two guard required.

**Supply-Chain Analysis**

***Supply Chain 1:***

*Ammonium nitrate manufacturers produce ammonium nitrate and supply it to the explosives manufactures who in turn make AN based explosives such as ANFO and provide it to mines and commercial infrastructure industry.*

*Margin: Manufacturers: 4-7%*



*References: TechSci Analysis, Secondary Sources, Primary Interviews*

***Supply Chain 2:***

*Ammonium nitrate manufacturers import ammonium nitrate and produce melt or other prilled form and supply it to distributors/trades who in turn supply to the explosives manufactures. Explosives manufacturers produce AN based explosives such as ANFO and provide it to mines and commercial infrastructure industry.*

*Margin:*

*Manufacturers: 4-7%*

*Traders/ Distributors: 6-7%*



*References: TechSci Analysis, Secondary Sources, Primary Interviews*

***Supply Chain 3:***

*Ammonium nitrate manufacturers produce ammonium nitrate supply it to explosives manufactures. Explosives manufacturers produce AN based explosives such as ANFO and supply to traders and distributors who provide it to mines and commercial infrastructure industry.*

*Margin:*

*Manufacturers: 4-7%*

*Traders/ Distributors: 6-7%*



*References: TechSci Analysis, Secondary Sources, Primary Interviews*

***Supply Chain 4:***

*Ammonium nitrate manufacturers produce ammonium nitrate supply it directly to the mines and commercial infrastructure industry.*

*Margin:*

*Manufacturers: 4-7%*



*References: TechSci Analysis, Secondary Sources, Primary Interviews*

***Supply Chain 5:***

*Ammonium nitrate manufacturers produce ammonium nitrate to the Pharmaceuticals/Freezing Mixtures/Rocket Propellant/Paints/Plastics manufacturers. These manufacturers produce Nitrous Oxide, Anesthesia, and other Products, and supply it to the respective end use industries.*

*Margin:*

*Manufacturers: 4-7%*



*References: TechSci Analysis, Secondary Sources, Primary Interviews*

***Supply Chain 6:***

*Ammonium nitrate manufacturers produce ammonium nitrate to the Pharmaceuticals/Freezing Mixtures/Rocket Propellant/Paints/Plastics manufacturers. These manufacturers produce Nitrous Oxide, Anesthesia, and other Products, and supply it to traders/distributors who provide the final product to the respective end use industries.*

*Margin:*

*Manufacturers: 4-7%*

*Traders/ Distributors: 6-7%*



*References: TechSci Analysis, Secondary Sources, Primary Interviews*

**2.7 Imports-Exports**

**India Ammonium Nitrate Imports, By Value (INR Crores) & By Volume (Thousand Metric Tons)**

*References: Ministry of Commerce, DGFT*

**India Ammonium Nitrate Market, Import, By country, By Value (INR Crore)**

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Country | 2015 | 2016 | 2017 | 2018 | 2019 | 2020 | 2021 |
| **Singapore** | - | - | - | - | 269 | 41 | 160 |
| **Turkey** | - | - | - | - | - | 215 | 110 |
| **Russia** | 111 | 173 | 365 | 151 | - | 64 | 50 |
| **Bulgaria** | - | - | - | 25 | 128 | 156 | 41 |
| **Uzbekistan** | - | - | - | 8 | - | 2 | 26 |

*References: Ministry of Commerce, DGFT*

**India Ammonium Nitrate Market, Import, By country, By Volume (Thousand Metric Tons)**

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Country | 2015 | 2016 | 2017 | 2018 | 2019 | 2020 | 2021 |
| **Singapore** | - | - | - | - | 134 | 22 | 86 |
| **Turkey** | - | - | - | - | - | 106 | 55 |
| **Russia** | 49 | 87 | 210 | 88 | - | 31 | 26 |
| **Bulgaria** | - | - | - | 15 | 68 | 76 | 22 |
| **Uzbekistan** | - | - | - | 5 | - | 1 | 14 |

*References: Ministry of Commerce, DGFT*

**Imported POI Applications:**

* Two Grades of ammonium nitrate, namely, Explosive Grade Ammonium Nitrate, and Fertilizer Grade Ammonium Nitrate (FGAN) are mainly being import. Ammonium Nitrate Melt can’t be imported as it is not feasible. Similarly, Pharmaceuticals Grade Ammonium Nitrate is not imported in India. Deepak Fertilizers is one of the major manufacturers of Pharmaceuticals Grade Ammonium Nitrate and sells it as a specialty product while pricing it at a higher rate as compared to other grades of AN.
* All the ammonium nitrate imported in India goes to the explosives industry. Explosives manufactures use ammonium nitrate to manufacture ANFO and other emulsion explosives.
* Companies follow a trend of importing Fertilizer Grade Ammonium Nitrate (FGAN) and using it for explosives manufacturing process.
* Trading of ammonium nitrate is not permitted in India. Any company which imports AN must manufacture explosives or AN Melt/LDAN/HDAN or any other product and then resell it.
* Companies importing AN include explosives manufacturers, ammonium nitrate manufacturers, and end use customers.

**India Ammonium Nitrate Exports, By Value (INR Crores) & By Volume (Thousand Metric Tons)**

*References: Ministry of Commerce, DGFT*

**India Ammonium Nitrate Market, Export, By country, By Value (INR Crore)**

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Country | 2015 | 2016 | 2017 | 2018 | 2019 | 2020 | 2021 |
| **Sri Lanka** | 7.9 | 4.4 | 15.8 | 10.7 | 9.7 | 8.1 | 11.3 |
| **Ethiopia** | 0.5 | 5.6 | 13.8 | 8.8 | 12.8 | 9.0 | 7.7 |
| **Kenya** | 2.9 | 7.8 | 1.3 | 4.8 | 6.5 | 7.2 | 5.7 |
| **United Arab Emirates** | - | - | 1.9 | - | 0.2 | 2.4 | 3.3 |
| **Ghana** | - | - | - | 1.3 | 1.2 | 3.3 | 3.1 |

*References: Ministry of Commerce, DGFT*

**India Ammonium Nitrate Market, Export, By country, By Volume (Thousand Metric Tons)**

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Country | 2015 | 2016 | 2017 | 2018 | 2019 | 2020 | 2021 |
| **Sri Lanka** | 2.7 | 1.3 | 4.7 | 3.5 | 2.8 | 2.3 | 3.1 |
| **Ethiopia** | 0.2 | 2.1 | 5.4 | 3.5 | 4.6 | 3.3 | 2.7 |
| **Kenya** | 1.3 | 3.2 | 0.5 | 2.1 | 2.6 | 3.1 | 2.3 |
| **Ghana** | - | - | - | 0.7 | 0.4 | 1.5 | 1.3 |
| **United Arab Emirates** | - | - | 0.8 | - | 0.06 | 0.8 | 1.2 |

*References: Ministry of Commerce, DGFT*

**India Ammonium Nitrate Market, Exports, By Consumption Sectors, By Volume (Metric Tons)**

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Country | 2015 | 2016 | 2017 | 2018 | 2019 | 2020 | 2021 |
| **Fertilizers** | 4,751 | 8,835 | 8,932 | 10,431 | 12,493 | 8,295 | 5,845 |
| **Explosives** | 3,853 | 7,171 | 7,257 | 8,483 | 10,170 | 6,759 | 4,767 |
| **Pharmaceuticals** | 2,972 | 5,427 | 5,388 | 6,178 | 7,265 | 4,736 | 3,277 |
| **Others** | 482 | 897 | 905 | 1,053 | 1,255 | 828 | 579 |

*References: Ministry of Commerce, DGFT*

*Others include Freezing Mixtures, Rocket Propellants, Paints, Plastics, etc.*

**2.8 Anti-Dumping Duty:**

Anti-dumping duty is imposed on the import of ammonium nitrate from Russia, Indonesia,

Georgia and Iran into India.

The points concluded as per the anti-dumping are:

1. The product under consideration has been exported to India from subject countries below its normal value, resulting in dumping.
2. The domestic industry has suffered material injury due to dumping of the product under consideration from the subject countries
3. There is a threat of injury due to imminent imports of like article in large quantities
4. The domestic industry produces similar products

In order to remove the injury cause to domestic industry by the abovementioned country, anti-dumping duties are imposed by the government of India. It is effective for a period of five years starting from the date of imposition (unless revoked, superseded or amended earlier).

As per Anti-dumping Rules, the Authority is required to examine whether

1. domestic producers expressly supporting the application account for more than twenty five percent of the total production of the like article by the domestic industry; and
2. the application is supported by those domestic producers whose collective output constitute more than fifty percent of the total production of the like article produced by that portion of the domestic industry expressing either support for or opposition to the application.

Below the table contains details of anti-dumping duties on ammonium nitrate:

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **S.No.** | **Tarrif No.** | **Description Item** | **Country Of Goods** | **Country Of Origin** | **Producer Of Export** | **Exporter** | **Duty amount** | **Unit (in USD)** |
| 1 | 3102 30 00 | Ammonium Nitrate "whether prilled, granular, or in other solid form, with or without additives or coating, and having bulk density in excess of 0.83 g/cc | Russia | Switzerland | Novomoskovskaya (NakAzot) | Euro Chem Trading GmbH Through Rawfert Offshore Sal | Nil | USD/MT |
| 2 | 3102 30 00 | Ammonium Nitrate "whether prilled, granular, or in other solid form, with or without additives or coating, and having bulk density in excess of 0.83 g/cc | Russia | Russia | JSC Azot, Kemerovo | SBU Nitrotrade AG | 11.42 | USD/MT |
| 3 | 3102 30 00 | Ammonium Nitrate "whether prilled, granular, or in other solid form, with or without additives or coating, and having bulk density in excess of 0.83 g/cc | Russia | Singapore | JSC Azot, Kemerovo | SBU Nitrotrade AG Through Dreymoor Fertilizers Overseas Pte Ltd | 11.42 | USD/MT |
| 4 | 3102 30 00 | Ammonium Nitrate "whether prilled, granular, or in other solid form, with or without additives or coating, and having bulk density in excess of 0.83 g/cc | Russia | Russia | Any Combination Other Than 2 Above | | 25.00 | USD/MT |
| 5 | 3102 30 00 | Ammonium Nitrate "whether prilled, granular, or in other solid form, with or without additives or coating, and having bulk density in excess of 0.83 g/cc | Russia | Any Country Other Than the Subject Countries | Any Combination Other Than 1 & 3 Above | | 25.00 | USD/MT |
| 6 | 3102 30 00 | Ammonium Nitrate "whether prilled, granular, or in other solid form, with or without additives or coating, and having bulk density in excess of 0.83 g/cc | Any Country Other Than the Subject Countries | Russia | Any | Any | 25.00 | USD/MT |
| 7 | 3102 30 00 | Ammonium Nitrate "whether prilled, granular, or in other solid form, with or without additives or coating, and having bulk density in excess of 0.83 g/cc | Georgia | Georgia | Any | Any | 53.99 | USD/MT |
| 8 | 3102 30 00 | Ammonium Nitrate "whether prilled, granular, or in other solid form, with or without additives or coating, and having bulk density in excess of 0.83 g/cc | Georgia | Any Country Other Than the Subject Countries | Any | Any | 53.99 | USD/MT |
| 9 | 3102 30 00 | Ammonium Nitrate "whether prilled, granular, or in other solid form, with or without additives or coating, and having bulk density in excess of 0.83 g/cc | Any Country Other Than the Subject Countries | Georgia | Any | Any | 53.99 | USD/MT |
| 10 | 3102 30 00 | Ammonium Nitrate "whether prilled, granular, or in other solid form, with or without additives or coating, and having bulk density in excess of 0.83 g/cc | Iran | Iran | Any | Any | 60.35 | USD/MT |
| 11 | 3102 30 00 | Ammonium Nitrate "whether prilled, granular, or in other solid form, with or without additives or coating, and having bulk density in excess of 0.83 g/cc | Iran | Any Country Other Than the Subject Countries | Any | Any | 60.35 | USD/MT |
| 12 | 3102 30 00 | Ammonium Nitrate "whether prilled, granular, or in other solid form, with or without additives or coating, and having bulk density in excess of 0.83 g/cc | Any Country Other Than the Subject Countries | Iran | Any | Any | 60.35 | USD/MT |
| 13 | 3102 30 00 | Ammonium Nitrate "whether prilled, granular, or in other solid form, with or without additives or coating, and having bulk density in excess of 0.83 g/cc | Indonesia | Indonesia | Any | Any | 26.07 | USD/MT |
| 14 | 3102 30 00 | Ammonium Nitrate "whether prilled, granular, or in other solid form, with or without additives or coating, and having bulk density in excess of 0.83 g/cc | Indonesia | Any Country Other Than the Subject Countries | Any | Any | 26.07 | USD/MT |
| 15 | 3102 30 00 | Ammonium Nitrate "whether prilled, granular, or in other solid form, with or without additives or coating, and having bulk density in excess of 0.83 g/cc | Any Country Other Than the Subject Countries | Indonesia | Any | Any | 26.07 | USD/MT |

**Anti-Dumping Duty & Landed Cost (INR/MT), By Year**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| 2018 | | | | 2019 | | |
| Country Name | **ASP** | **Anti-dumping duty (INR/MT)** | **Landed Cost (ASP+ Anti-Dumping) INR/MT** | **ASP** | **Anti-dumping duty (INR/MT)** | **Landed Cost (ASP+ Anti-Dumping) INR/MT** |
| Russia | 17,118 | 867 | 17,985 | 20,993 | 867 | 21,860 |
| Russia\* |  | 1,897 | 19,015 |  | 1,897 | 22,890 |
| Indonesia | 16,103 | 1,978 | 18,082 | - | 1,978 | - |
| Georgia | 16,199 | 4,097 | 20,296 | - | 4,097 | - |
| Iran | 13,937 | 4,580 | 18,517 | 14,074 | 4,580 | 18,654 |

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| 2020 | | | | 2021 | | |
| Country Name | **ASP** | **Anti-dumping duty (INR/MT)** | **Landed Cost (ASP + Anti-dumping) INR/MT** | **ASP** | **Anti-dumping duty (INR/MT)** | **Landed Cost (ASP+ Anti-Dumping) INR/MT** |
| Russia | 20,993 | 867 | 21,860 | 18914 | 867 | 19,780 |
| Russia\* |  | 1,897 | 22,890 |  | 1,897 | 20,811 |
| Indonesia | - | 1,978 | - | - | 1,978 | - |
| Georgia | - | 4,097 | - | - | 4,097 | - |
| Iran | - | 4,580 | - | - | 4,580 | - |

*\*Two different anti-dumping duty is imposed on Russia from two different companies. Anti-dumping duty of INR 867 per ton is imposed on JSC Azot, Kemerovo (technical ammonium nitrate manufacturer). For manufacturers other than on JSC Azot, Kemerovo, anti-dumping duty of INR 1,897 per ton is imposed.*

**2.9 Pricing Analysis**

**Import-Export Pricing**

**India Import Average Selling Price of Ammonium Nitrate – CIF Price (INR Per Metric Ton)**

|  |  |
| --- | --- |
| Years | INR/Ton |
| 2015 | 21,717 |
| 2016 | 19,959 |
| 2017 | 17,398 |
| 2018 | 16,169 |
| 2019 | 19,223 |
| 2020 | 20,426 |
| 2021 | 19,058 |
| 2022 | 28,587 |
| 2023 | 20,011 |
| 2024 | 22,894 |
| 2025 | 23,327 |
| 2026 | 23,760 |
| 2027 | 24,193 |
| 2028 | 24,626 |
| 2029 | 25,059 |
| 2030 | 25,492 |

*References: TechSci Analysis, Secondary Sources, Primary Interviews, Ministry of Commerce, DGFT*

**India Import Average Selling Price of Ammonium Nitrate - CIF Price, By Country (INR Per Metric Ton)**

|  |  |  |
| --- | --- | --- |
| Country | 2020 | 2021 |
| **Singapore** | 18,835 | 18,496 |
| **Turkey** | 20,316 | 19,835 |
| **Russia** | 20,993 | 18,914 |
| **Bulgaria** | 20,482 | 18,517 |
| **Uzbekistan** | 15,663 | 18,043 |

*References: TechSci Analysis, Secondary Sources, Primary Interviews, Ministry of Commerce, DGFT*

**India Export Average Selling Price of Ammonium Nitrate - FOB Price (INR Per Metric Ton)**

|  |  |
| --- | --- |
| Years | INR/Metric Ton |
| 2015 | 26,632 |
| 2016 | 25,975 |
| 2017 | 26,489 |
| 2018 | 24,076 |
| 2019 | 26,884 |
| 2020 | 25,697 |
| 2021 | 27,859 |
| 2022 | 39,003 |
| 2023 | 25,352 |
| 2024 | 25,098 |
| 2025 | 24,596 |
| 2026 | 27,989 |
| 2027 | 28,112 |
| 2028 | 28,235 |
| 2029 | 28,357 |
| 2030 | 28,480 |

*References: TechSci Analysis, Secondary Sources, Primary Interviews, Ministry of Commerce, DGFT*

**India Export Average Selling Price of Ammonium Nitrate - FOB Price, By Country (INR Per Metric Ton)**

|  |  |  |
| --- | --- | --- |
| Country | 2020 | 2021 |
| **Sri Lanka** | 34,605 | 35,862 |
| **Ethiopia** | 27,061 | 28,645 |
| **Kenya** | 23,365 | 24,250 |
| **United Arab Emirates** | 16,539 | 25,941 |
| **Ghana** | 41,525 | 25,428 |

*References: TechSci Analysis, Secondary Sources, Primary Interviews, Ministry of Commerce, DGFT*

**Ex-Factory Pricing**

**India Ex-Factory Average Selling Price of Ammonium Nitrate (INR Per Metric Ton)**

|  |  |
| --- | --- |
| Years | INR/Metric Ton |
| 2015 | 38,208 |
| 2016 | 35,534 |
| 2017 | 37,310 |
| 2018 | 35,445 |
| 2019 | 37,572 |
| 2020 | 36,154 |
| 2021 | 38,323 |
| 2022 | 49,820 |
| 2023 | 37,365 |
| 2024 | 35,870 |
| 2025 | 34,794 |
| 2026 | 38,855 |
| 2027 | 38,975 |
| 2028 | 39,095 |
| 2029 | 39,215 |
| 2030 | 39,334 |

*References: TechSci Analysis, Secondary Sources, Primary Interviews, Ministry of Commerce, DGFT*

|  |  |
| --- | --- |
| **Net Price After Discount & Cash Rebate (INR/MT)** | **37**,822 |

There is a cash rebate & discount of INR 501/MT in case there is advance payment made. The net price after discount is INR 37,822 per MT.

**Regression: Ammonium Nitrate and Ammonia Price**

|  |  |  |
| --- | --- | --- |
| Year | Ammonia Price | Ammonium Nitrate |
| 2015 | 30480 | 38208 |
| 2016 | 29210 | 35534 |
| 2017 | 27486 | 37310 |
| 2018 | 29760 | 35445 |
| 2019 | 30250 | 37572 |
| 2020 | 31810 | 36154 |
| 2021 | 35130 | 38323 |

|  |  |
| --- | --- |
| SUMMARY OUTPUT |  |
|  |  |
| *Regression Statistics* | |
| Multiple R | 0.461298 |
| R Square | 0.212796 |
| Adjusted R Square | 0.015995 |
| Standard Error | 1173.391 |
| Observations | 6 |

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| ANOVA |  |  |  |  |  |
|  | *df* | *SS* | *MS* | *F* | *Significance F* |
| Regression | 1 | 1488748 | 1488748 | 1.081273 | 0.357134 |
| Residual | 4 | 5507388 | 1376847 |  |  |
| Total | 5 | 6996136 |  |  |  |

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | *Coefficients* | *Standard Error* | *t Stat* | *P-value* | *Lower 95%* | *Upper 95%* | *Lower 95.0%* | *Upper 95.0%* |
| Intercept | 30359.48 | 6138.417 | 4.945816 | 0.007784 | 13316.5 | 47402.45 | 13316.5 | 47402.45 |
| 30480 | 0.207906 | 0.19994 | 1.039843 | 0.357134 | -0.34722 | 0.763029 | -0.34722 | 0.763029 |

|  |  |  |
| --- | --- | --- |
| RESIDUAL OUTPUT |  |  |
|  |  |  |
| *Observation* | *Predicted 38208* | *Residuals* |
| 1 | 36432.42 | -898.416 |
| 2 | 36073.99 | 1236.014 |
| 3 | 36546.76 | -1101.76 |
| 4 | 36648.64 | 923.3611 |
| 5 | 36972.97 | -818.973 |
| 6 | 37663.22 | 659.779 |

|  |  |
| --- | --- |
| PROBABILITY OUTPUT | |
|  |  |
| *Percentile* | *38208* |
| 8.333333 | 35445 |
| 25 | 35534 |
| 41.66667 | 36154 |
| 58.33333 | 37310 |
| 75 | 37572 |
| 91.66667 | 38323 |

**Regression: Ammonium Nitrate and Weak Nitric Acid (INR)**

|  |  |  |
| --- | --- | --- |
| Year | Weak Nitric Acid | Ammonium Nitrate |
| 2015 | 21237 | 38208 |
| 2016 | 22724 | 35534 |
| 2017 | 24087 | 37310 |
| 2018 | 19270 | 35445 |
| 2019 | 21582 | 37572 |
| 2020 | 19483 | 36154 |
| 2021 | 20652 | 38323 |

|  |  |
| --- | --- |
| SUMMARY OUTPUT | |
| *Regression Statistics* | |
| Multiple R | 0.249132 |
| R Square | 0.062067 |
| Adjusted R Square | -0.17242 |
| Standard Error | 1280.811 |
| Observations | 6 |

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| ANOVA |  |  |  |  |  |
|  | *df* | *SS* | *MS* | *F* | *Significance F* |
| Regression | 1 | 434228.6 | 434228.6 | 0.264697 | 0.634033 |
| Residual | 4 | 6561907 | 1640477 |  |  |
| Total | 5 | 6996136 |  |  |  |

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | *Coefficients* | *Standard Error* | *t Stat* | *P-value* | *Lower 95%* | *Upper 95%* | *Lower 95.0%* | *Upper 95.0%* |
| Intercept | 33388.45 | 6502.375 | 5.134808 | 0.006816 | 15334.96 | 51441.94 | 15334.96 | 51441.94 |
| 21237 | 0.156554 | 0.304292 | 0.514487 | 0.634033 | -0.6883 | 1.001404 | -0.6883 | 1.001404 |

|  |  |  |
| --- | --- | --- |
| RESIDUAL OUTPUT | |  |
|  |  |  |
| *Observation* | *Predicted 38208* | *Residuals* |
| 1 | 36945.99 | -1411.99 |
| 2 | 37159.37 | 150.6314 |
| 3 | 36405.25 | -960.247 |
| 4 | 36767.2 | 804.7995 |
| 5 | 36438.59 | -284.593 |
| 6 | 36621.61 | 1701.395 |

|  |  |
| --- | --- |
| PROBABILITY OUTPUT | |
| *Percentile* | *38208* |
| 8.333333 | 35445 |
| 25 | 35534 |
| 41.66667 | 36154 |
| 58.33333 | 37310 |
| 75 | 37572 |
| 91.66667 | 38323 |

TechSci used veracious techniques to understand the price trend, correlation and forecast supported with primary interview among key suppliers

**Linear Regression**

* Linear regression is a statistical technique that examines the linear relationship between a dependent variable and one or more independent variables.
* Linear relationship means the change in an independent variable(s) causes a change in the dependent variable.
* Positive Linear Relationship: When the independent variable increases, the dependent variable increases too.
* Negative Linear Relationship: When the independent variable increases, the dependent variable decreases.
* Linear Regression suggested to know the relationship between— Ammonia and Ammonium Nitrate, Ammonium Nitrate and Weak Nitric Acid, Ammonia and Weak Nitric Acid at 95% confidence level
* R Square values were positive with a varying degree in all possible propositions, indicating a positive linear relationship but it was not closer to 1. It indicates that there are various factors too which impact more on price.

**Exponential Smoothing (Based on Past Data)**

Exponential smoothing forecasting is based on the AAA version (additive error, additive trend, and additive seasonality) of the Exponential Triple Smoothing (ETS) algorithm, which smoothest out minor deviations in past data trends by detecting seasonality patterns and confidence intervals.

TechSci used the Exponential Smoothing while considering the price forecast and Primary interviews from the industry shown the confidence on the output

**Factors Affecting Prices:**

Ammonia and weak nitric acid prices are mainly affecting ammonia nitrate prices.

Ammonia is the main raw material used to produce weak nitric acid which in turn is used to manufacture ammonium nitrate. Many weak nitric acid manufacturers also manufacture their own ammonia supply to vertically integrate production.

As of FY2019, India imported INR 9,451 Crore of Ammonia, becoming the first largest importer of Ammonia in the world. India imports Ammonia primarily from: Saudi Arabia (INR 5,221 Crore), Qatar (INR 1,093 Crore), Indonesia (INR 672 Crore), Egypt (INR 576 Crore), and Russia (INR 573 Crore).

Although ammonia producers use a variety of purchasing options to manage the volatility of natural gas, the prices are still impacted.

Ammonia prices vary monthly and are heavily impacting the ammonia nitrate and weak nitric acid market. Recently there has been a disruption of natural gas supply chain in Europe which is impacting the market prices. Natural gas prices have risen sharply globally in the recent months are record high prices. These high prices are due to the factors such as increased demand particularly from Asia due to a post-pandemic recovery; low gas inventories; and lesser-than-usual gas supplies from Russia. In Europe, the prices have risen more than 250% in FY2022 (up to October 2021). Asia has witnessed an increase of 175% since January 2021 end. In the coming winter months, the gas stocks are expected to be much lower than usual in Europe thus the supply pressure is high. Owing to transmission issues, pipeline issues, production issues, etc. gas prices have moved up and most of the ammonia complexes have been shut down in Europe because of not being able to withstand the gas prices.

Norway based Yara International is one of the largest manufacturers of fertilizers is cutting off 40% of its European ammonia production due to high gas prices. It has a European output capacity of 4.9 million Tons per annum out of which 2 million Tons would be impacted.

Similarly, U.S.-based CF Industries Holdings Inc is also planning to halt operations at its two UK plants because of high natural gas prices.

As a result of this ammonia prices have moved up to 900 Dollar which otherwise is 300-400 dollar. Because of this, Europe depends on higher cost imported ammonia, thus FGAN (the imported grade of ammonium nitrate) prices have moved up significantly. Previously it was 180-190 dollar which reached up to 250-300 dollar from Jan-Aug. In Sept and Oct, it is traded more than 600 dollars.

These prices are expected to be high until February 2022. March 2022 onwards prices are expected to stabilize as supply will restore from Russia.

A picture containing text, electronics, display

Description automatically generated

**INDIA WEAK NITRIC ACID MARKET AND BUSINESS ENVIRONMENT ASSESSMENT**

**Weak Nitric Acid**

|  |  |
| --- | --- |
| Chemical Formula | HNO3 |
| Molar Mass/ Molecular Weight | 63.013 grams per mole |
| Density | 1.5129 g/cu cm at 20 °C |
| Melting Point | -44 °F |
| Boiling Point | 181 °F at 760 mm Hg |

Diagram

Description automatically generated

**Applications:** Around 70% of the total weak nitric acid produced is used as an intermediate in the manufacturing process of ammonium nitrate. It is also used in manufacturing explosives, as it is used for organic nitration.

Other applications include nitrobenzene, di-nitrotoluenes, and other chemical intermediates, concentrated nitric acid, Sodium Nitrate, Potassium Nitrate, Calcium Nitrate, Glyoxal, H-Acid, Nitrobenzene and other Nitro Derivatives, Dyes and Dye Intermediates, Drugs and Pharmaceuticals, Pickling of Steel and Metallurgy, Acrylic Fibre, Pesticides, etc.

**Production:**

Two types of systems are mainly used to produce weak nitric acid, which are single-stage pressure process, and dual stage pressure process.

Weak Nitric Acid is produced by oxidation of ammonia gas and air to yields nitric oxide (NO).

4NH3 + 5O2 4NO + 6H2O

The second step includes oxidation of nitric oxide to gives nitrogen dioxide.

2NO + O2 2NO2 N2O4

The final step of production is absorption of nitrogen dioxide after being cooled to give (weak nitric acid) HNO3.

3NO2 + H2O 2HNO3 + NO

**India Weak Nitric Acid Market, Installed Capacity, By Volume (Thousand Metric Tons) (FY2015-FY2030)**

*References: TechSci Analysis, Secondary Sources, Primary Interviews*

**India Weak Nitric Acid Installed Capacity, By Location, By Volume (Thousand MT), FY2021**

|  |  |  |
| --- | --- | --- |
| Company | Location | Installed Capacity (Thousand Metric Tons) |
| Deepak Fertilizers and Petrochemicals Limited | Taloja, Maharashtra | 685 |
| Dahej, Gujarat | 148 |
| Srikakulam, Andhra Pradesh | 56 |
| Gujarat Narmada Valley Fertilizers & Chemicals Ltd. | Bharuch, Gujarat | 348 |
| Rashtriya Chemicals and Fertilizers Limited | Trombay, Mumbai | 396 |
| National Fertilizers Limited | Nangal, Punjab | 182 |
| Kutch Chemicals Industries Limited | Kutch, Gujarat | 66 (FY2025 onwards) |

*References: TechSci Analysis, Secondary Sources, Primary Interviews, Company Annual Reports*

India’s overall weak nitric acid installed capacity was 1,628 thousand metric tons in FY2015 which increased up to 1,814 thousand metric tons in FY2021.

Out of total, Deepak Fertilizers and Petrochemicals Limited has maximum share of approximately 49% followed by Gujarat Narmada Fertilizers and Chemicals Limited with 19%, Rashtriya Chemicals and Fertilizers Limited with 24% and National Fertilizers Limited with 8%.

**India Weak Nitric Acid Market, Production, By Volume (Thousand Metric Tons) (FY2015-FY2030)**

*References: TechSci Analysis, Secondary Sources, Primary Interviews*

The overall weak nitric acid production in India was 1,471 thousand metric tons in FY2021 growing from 1,319 thousand metric tons in FY2015. Out of which, Deepak Fertilizers and Petrochemicals Limited has maximum share of approximately 42% followed by Gujarat Narmada Fertilizers and Chemicals Limited, Rashtriya Chemicals and Fertilizers Limited, National Fertilizers Limited. From the above top manufacturers of ammonium nitrate, GNFC has the maximum operating efficiency of around 113% in FY2021.

**India Weak Nitric Acid Market, Operating Efficiency (%) (FY2015-FY2030)**

*References: TechSci Analysis, Secondary Sources, Primary Interviews, Company Annual Reports*

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | FY15 | FY16 | FY17 | FY18 | FY19 | FY20 | FY21 | FY22 |
| India Total | **81%** | **86%** | **87%** | **95%** | **88%** | **86%** | **81%** | **86%** |
| DFPCL | 61% | 73% | 76% | 91% | 78% | 74% | 70% | 75% |
| GNFC | 122% | 121% | 122% | 122% | 122% | 127% | 113% | 122% |
| RCF | 95% | 95% | 95% | 97% | 97% | 94% | 93% | 97% |
| NFL | 49% | 49% | 49% | 53% | 53% | 47% | 46% | 49% |
| Kutch Chemical | - | - | - | - | - | - | - | - |
|  | **FY23** | **FY24** | **FY25** | **FY26** | **FY27** | **FY28** | **FY29** | **FY30** |
| India Total | **86%** | **81%** | **82%** | **85%** | **87%** | **87%** | **89%** | **89%** |
| DFPCL | 75% | 68% | 71% | 76% | 79% | 79% | 81% | 81% |
| GNFC | 122% | 123% | 123% | 125% | 125% | 125% | 125% | 125% |
| RCF | 97% | 97% | 97% | 97% | 99% | 99% | 99% | 99% |
| NFL | 49% | 50% | 50% | 50% | 55% | 55% | 55% | 55% |
| Kutch Chemical | - | - | 60% | 65% | 65% | 65% | 70% | 70% |

India weak nitric acid overall annual operating efficiency reached 81% as of FY2021 and is forecasted to realise an operating efficiency of 89%.

Gujarat Narmada Fertilizers and Chemicals Limited has the maximum operating efficiency of around 113% in FY2021 followed by Rashtriya Chemicals and Fertilizers Limited with 93%, DFPCL with 70% and NFL with 46%.

**India Weak Nitric Acid Market, Installed Capacity, By Volume (Thousand Metric Tons) (FY2015-FY2030) – Including GNFC, Chambal & NFL Capacity Expansions**

*References: TechSci Analysis, Secondary Sources, Primary Interviews*

* GNFC is planning a capacity expansion in weak nitric acid plant of 231 KMT from FY2025 onwards.
* NFL plans to start operating of its second weak nitric acid plant from FY2025 onwards
* CFCL is planning to set up a WNA manufacturing plant with installed capacity of 180 KMT per annum.

**India Weak Nitric Acid Market, Production, By Volume (Thousand Metric Tons) (FY2015-FY2030) – Including GNFC, Chambal & NFL Capacity Expansions**

*References: TechSci Analysis, Secondary Sources, Primary Interviews*

**India Weak Nitric Acid Market, Operating Efficiency (%) (FY2015-FY2030) – Including GNFC, Chambal & NFL Capacity Expansions**

*References: TechSci Analysis, Secondary Sources, Primary Interviews, Company Annual Reports*

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | FY15 | FY16 | FY17 | FY18 | FY19 | FY20 | FY21 | FY22 |
| India Total | **81%** | **86%** | **87%** | **95%** | **88%** | **86%** | **81%** | **86%** |
| DFPCL | 61% | 73% | 76% | 91% | 78% | 74% | 70% | 75% |
| GNFC | 122% | 121% | 122% | 122% | 122% | 127% | 113% | 122% |
| RCF | 95% | 95% | 95% | 97% | 97% | 94% | 93% | 97% |
| NFL | 49% | 49% | 49% | 53% | 53% | 47% | 46% | 49% |
| Kutch Chemical | - | - | - | - | - | - | - | - |
| CFCL | - | - | - | - | - | - | - | - |
|  | **FY23** | **FY24** | **FY25** | **FY26** | **FY27** | **FY28** | **FY29** | **FY30** |
| India Total | **86%** | **82%** | **76%** | **78%** | **81%** | **82%** | **84%** | **86%** |
| DFPCL | 75% | 68% | 71% | 76% | 79% | 79% | 81% | 81% |
| GNFC | 122% | 123% | 82% | 82% | 85% | 85% | 90% | 95% |
| RCF | 97% | 97% | 97% | 97% | 99% | 99% | 99% | 99% |
| NFL | 49% | 70% | 70% | 73% | 78% | 80% | 80% | 80% |
| Kutch Chemical | - | - | 60% | 65% | 65% | 65% | 70% | 70% |
| CFCL | - | - | 50% | 50% | 55% | 60% | 65% | 70% |

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| India Weak Nitric Acid Market, Installed Capacity, By Company, By Volume (Metric Tonnes) – Including GNFC, Chambal & NFL Capacity Expansions | | | | | | | | |
|  | FY15 | FY16 | FY17 | FY18 | FY19 | FY20 | FY21 | FY22 |
| DFPCL | 703 | 703 | 703 | 703 | 885 | 885 | 889 | 889 |
| GNFC | 348 | 348 | 348 | 348 | 348 | 348 | 348 | 348 |
| RCF | 396 | 396 | 396 | 396 | 396 | 396 | 396 | 396 |
| NFL | 182 | 182 | 182 | 182 | 182 | 182 | 182 | 182 |
| Kutch Chemical | - | - | - | - | - | - | - | - |
| CFCL | - | - | - | - | - | - | - | - |
|  | **FY23** | **FY24** | **FY25** | **FY26** | **FY27** | **FY28** | **FY29** | **FY30** |
| DFPCL | 889 | 1186 | 1186 | 1186 | 1186 | 1186 | 1186 | 1186 |
| GNFC | 348 | 348 | 579 | 579 | 579 | 579 | 579 | 579 |
| RCF | 396 | 396 | 396 | 396 | 396 | 396 | 396 | 396 |
| NFL | 182 | 182 | 182 | 182 | 182 | 182 | 182 | 182 |
| Kutch Chemical | - | - | 66 | 66 | 66 | 66 | 66 | 66 |
| CFCL | - | - | 180 | 180 | 180 | 180 | 180 | 180 |

*References: TechSci Analysis, Secondary Sources, Primary Interviews, Company Annual Reports*

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| India Weak Nitric Acid Market, Production, By Company, By Volume (Metric Tonnes) – Including GNFC, Chambal & NFL Capacity Expansions | | | | | | | | |
|  | FY15 | FY16 | FY17 | FY18 | FY19 | FY20 | FY21 | FY22 |
| DFPCL | 429 | 513 | 532 | 640 | 691 | 654 | 626 | 667 |
| GNFC | 425 | 421 | 424 | 425 | 425 | 441 | 393 | 425 |
| RCF | 376 | 376 | 376 | 384 | 384 | 372 | 368 | 384 |
| NFL | 89 | 89 | 89 | 96 | 96 | 86 | 84 | 89 |
| Kutch Chemical | - | - | - | - | - | - | - | - |
| CFCL | - | - | - | - | - | - | - | - |
|  | **FY23** | **FY24** | **FY25** | **FY26** | **FY27** | **FY28** | **FY29** | **FY30** |
| DFPCL | 667 | 801 | 839 | 898 | 934 | 934 | 958 | 958 |
| GNFC | 425 | 429 | 475 | 475 | 492 | 492 | 521 | 550 |
| RCF | 384 | 384 | 384 | 384 | 392 | 392 | 392 | 392 |
| NFL | 89 | 127 | 127 | 132 | 141 | 145 | 145 | 145 |
| Kutch Chemical | - | - | 40 | 43 | 43 | 43 | 46 | 46 |
| CFCL | - | - | 90 | 90 | 99 | 108 | 117 | 126 |

*References: TechSci Analysis, Secondary Sources, Primary Interviews, Company Annual Reports*

**India Weak Nitric Acid Market, By Volume (Thousand Metric Tons) – Domestic Consumption**

|  |  |
| --- | --- |
| **CAGR FY2015-FY2021** | **CAGR FY2022-FY2030** |
| 2.2% | 4.8% |

*References: TechSci Analysis, Secondary Sources, Primary Interviews*

In India, weak nitric acid domestic consumption stood at 1,456 thousand metric tons in FY2021 growing from 1,275 thousand metric tons with a CAGR of 2.2%. The major demand for WNA comes from the fertilizers industry which constitute approximately 34% of overall domestic consumption followed by ammonium nitrate manufacturing with 31% market share. Other consumption sectors are concentrated nitric acid manufacturing, dyes & paints, explosives, nitroaromatics, etc. manufacturing. Owing to the increasing demand for weak nitric acid from end use segments, it is expected that domestic consumption will increase at a CAGR of 4.8% by FY2030F reaching up to 2,414 thousand metric tons.

**India Weak Nitric Acid, Demand-Supply Gap, By Volume (Thousand MT)**

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | FY15 | FY16 | FY17 | FY18 | FY19 | FY20 | FY21 | FY22 |
| Capacity | 1628 | 1628 | 1628 | 1628 | 1810 | 1810 | 1814 | 1814 |
| Production | 1319 | 1399 | 1421 | 1546 | 1596 | 1553 | 1471 | 1565 |
| Operating rate (%) | 81% | 86% | 87% | 95% | 88% | 86% | 81% | 86% |
| Import | 0 | 0 | 4 | 27 | 36 | 30 | 26 | - |
| Export | 17 | 14 | 11 | 16 | 11 | 13 | 12 | - |
| Inventory | 26 | 28 | 28 | 31 | 32 | 31 | 29 | - |
| Domestic Consumption | 1275 | 1357 | 1385 | 1527 | 1589 | 1539 | 1456 | 1660 |
| Demand Supply Gap | - | - | - | - | - | - | - | -95 |
|  | **FY23** | **FY24** | **FY25** | **FY26** | **FY27** | **FY28** | **FY29** | **FY30** |
| Capacity | 1814 | 2111 | 2177 | 2177 | 2177 | 2177 | 2177 | 2177 |
| Production | 1565 | 1704 | 1782 | 1852 | 1904 | 1904 | 1931 | 1931 |
| Operating rate (%) | 86% | 81% | 82% | 85% | 87% | 87% | 89% | 89% |
| Import | - | - | - | - | - | - | - | - |
| Export | - | - | - | - | - | - | - | - |
| Inventory | - | - | - | - | - | - | - | - |
| Domestic Consumption | 1797 | 1950 | 2250 | 2268 | 2293 | 2325 | 2365 | 2414 |
| Demand Supply Gap | -232 | -246 | -468 | -416 | -389 | -421 | -433 | -483 |

*References: TechSci Analysis, Secondary Sources, Primary Interviews*

India overall weak nitric acid market operating efficiency is forecasted to increase up to 89% in FY2030 from 81% in FY2021. As of FY2021, imports stood at 26 thousand metric tons and exports stood at 12 thousand metric tons. Inventory of weak nitric acid is at 29 thousand metric tons as of FY2021.

As of FY2022 there is demand-supply gap in weak nitric acid; there is a shortage of supply by 95 thousand metric tons. However, the gap is expected to increase in the forecast period owing to the increasing demand from fertilizers and ammonia nitrate applications sectors. The market is estimated to observe a demand-supply gap of 483 thousand metric by FY2030.

**India Weak Nitric Acid, Demand-Supply Gap, By Volume (Thousand MT) —Including GNFC, CFCL & NFL Capacity Expansions**

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | FY15 | FY16 | FY17 | FY18 | FY19 | FY20 | FY21 | FY22 |
| Capacity | 1,628 | 1,628 | 1,628 | 1,628 | 1,810 | 1,810 | 1,814 | 1,814 |
| Production | 1,319 | 1,399 | 1,421 | 1,546 | 1,596 | 1,553 | 1,471 | 1,565 |
| Operating rate (%) | 81% | 86% | 87% | 95% | 88% | 86% | 81% | 86% |
| Import | 0.02 | 0.02 | 4 | 27 | 36 | 30 | 26 | - |
| Export | 17 | 14 | 11 | 16 | 11 | 13 | 12 | - |
| Inventory | 26 | 28 | 28 | 31 | 32 | 31 | 29 | - |
| Domestic Consumption | 1,275 | 1,357 | 1,385 | 1,527 | 1,589 | 1,539 | 1,456 | 1,660 |
| Demand Supply Gap | - | - | - | - | - | - | - | -95 |
|  | **FY23** | **FY24** | **FY25** | **FY26** | **FY27** | **FY28** | **FY29** | **FY30** |
| Capacity | 1,814 | 2,111 | 2,588 | 2,588 | 2,588 | 2,588 | 2,588 | 2,588 |
| Production | 1,565 | 1,740 | 1,954 | 2,021 | 2,100 | 2,114 | 2,179 | 2,217 |
| Operating rate (%) | 86% | 82% | 76% | 78% | 81% | 82% | 84% | 86% |
| Import | - | - | - | - | - | - | - | - |
| Export | - | - | - | - | - | - | - | - |
| Inventory | - | - | - | - | - | - | - | - |
| Domestic Consumption | 1,797 | 1,950 | 2,250 | 2,268 | 2,293 | 2,325 | 2,365 | 2,414 |
| Demand Supply Gap | -232 | -210 | -296 | -247 | -193 | -211 | -186 | -198 |

Board of Directors, Chambal Fertilizers and Chemicals Ltd (CFCL) has approved the WNA plant at its existing site at Gadepan, Rajasthan. The estimated investment is INR 1,170 Crores for the proposed capacity of 220 KMT of AN and 180KMT of WNA. It will take 36 months for the proposed plant to be operational, conditioned to see the light of implementation shortly. However, no significant development is reported on the implantation level

CFCL has strong focus on manufacturing Urea and selling surplus Ammonia in the merchant market with significantly very less emphasis on manufacturing ammonium nitrate. In addition, if CFCL enters in AN market, it will have to face tough competition from existing competitors in West India. TechSci understands that it is highly unlikely that CFCL will introduce AN plant

NFL has existing two product streams of WNA, contributing to a total installed capacity of 191,000 MT. Currently, only one stream is functional, producing 84,269 MT. A less possibility exists that The NFL may start operating the second stream because it would primarily support the second existing unit of AN (idle target), which is unlikely to happen as the plant location is at the disadvantage of proximity from customers.

The management of GNFC has approved a capacity expansion in the existing weak nitric acid plant of 231 KMT from FY2025 onwards, depending on the market conditions.

There is a demand-supply gap observed even when capacity expansions of NFL, Chambal Fertilizer and GNFC is considered.

**India Weak Nitric Acid Market, Installed Capacity, By Company (Thousand Metric Tons) (FY2021)**

Deepak Fertilizers and Petrochemicals Limited has the highest installed capacity of 889 thousand metric tons of weak nitric acid in FY 2021 with a share of 49%. DFPCL is followed by RCF with an installed capacity of 430 thousand metric tons per annum and a share of 21.8%. GNFC and NFL has 19.2% and 10.0% share respectively.

|  |  |
| --- | --- |
| By Company, By Volume (Thousand Metric Tons) | FY2021 |
| **Deepak Fertilizers and Petrochemicals Limited** | 889 |
| **Rashtriya Chemicals and Fertilizers Limited** | 396 |
| **Gujarat Narmada Valley Fertilizers & Chemicals Ltd.** | 348 |
| **National Fertilizers Limited** | 182 |

*References: TechSci Analysis, Secondary Sources, Primary Interviews, Company Annual Reports*

**India Weak Nitric Acid Market, Production, By Company (Thousand Metric Tons) (FY2021)**

|  |  |
| --- | --- |
| By Company, By Volume (Thousand Metric Tons) | FY2021 |
| **Deepak Fertilizers and Petrochemicals Limited** | 626 |
| **Rashtriya Chemicals and Fertilizers Limited** | 368 |
| **Gujarat Narmada Valley Fertilizers & Chemicals Ltd.** | 393 |
| **National Fertilizers Limited** | 84 |

*References: TechSci Analysis, Secondary Sources, Primary Interviews, Company Annual Reports*

Deepak Fertilizers and Petrochemicals Limited has the highest production of 626 thousand metric tons in FY 2021 with a share of 42.5%. DFPCL is followed by RCF with production of 368 thousand metric tons per annum and a share of 25%. GNFC and NFL has 26.7% and 5.7% share respectively.

**India Weak Nitric Acid Market, Merchant Sales, By Company (Thousand Metric Tons) (FY2021)**

|  |  |
| --- | --- |
| By Company, By Volume (Thousand Metric Tons) | FY2021 |
| **Gujarat Narmada Valley Fertilizers & Chemicals Ltd.** | 64 |
| **National Fertilizers Limited** | 62 |
| **Deepak Fertilizers and Petrochemicals Limited** | 53 |
| **Rashtriya Chemicals and Fertilizers Limited** | 25 |
| **Others** | 26 |

*References: TechSci Analysis, Secondary Sources, Primary Interviews, Company Annual Reports*

In Weak Nitric Acid Market, GNFC has a maximum share of 27.6% and merchant sales volume of 64 thousand metric tons in FY2021. After GNFC, National Fertilizers Limited is the market leader with a share of approximately 27% and merchant sales of 62 thousand metric tons followed by Deepak Fertilisers & Petrochemicals, and Rashtriya Chemicals and Fertilizers Limited.

**3.1 Weak Nitric Acid Applications Market**

**India Weak Nitric Acid Ammonium Nitrate Applications Market, By Volume (Thousand Metric Tons)**

|  |  |
| --- | --- |
| **CAGR FY2015-FY2021** | **CAGR FY2022-FY2030** |
| 4.6% | 4.2% |

*References: TechSci Analysis, Secondary Sources, Primary Interviews*

Weak nitric acid is captively used to manufacture ammonium nitrate which in turn is used in manufacturing explosives. Approximately 38% of the total market is accounted by ammonium nitrate applications. The market is growing from 401 thousand metric tons in FY2015 to 525 thousand metric tons in FY2021 with a CAGR of 4.6% during this period. WNA ammonium nitrate applications market is forecasted to grow with a CAGR of 4.2% and reach up to 880 thousand metric tons by FY2030.

India’s growing ammonium nitrate and explosives market is one of the major drivers for the WNA ammonium nitrate applications market.

The Ammonium Nitrate market stood at 874 thousand MT growing at a CAGR of 6.6% between FY2015-FY2021. The market is expected to reach 1,698 thousand MT by FY2030 growing at a CAGR of 7.8%. The demand of ammonium nitrate is constantly growing due to rising demand from end use sectors such as explosives, mining, and construction & infrastructure. The India explosives market has been growing significantly with a CAGR of 8.1% between FY2016-FY2022. The blasting agent segment is anticipated to grow and maintain dominance in forecast period.

**India Weak Nitric Acid Fertilizers Applications Market, By Volume (Thousand Metric Tons)**

|  |  |
| --- | --- |
| **CAGR FY2015-FY2021** | **CAGR FY2022-FY2030** |
| 0.9% | 4.8% |

*References: TechSci Analysis, Secondary Sources, Primary Interviews*

Weak nitric acid is captively used to manufacture nitrogenous fertilizers. More than 25% of the total market is accounted by fertilizers applications. The market is growing from 385 thousand metric tons in FY2015 to 406 thousand metric tons in FY2021 with a CAGR of 0.9% during this period. WNA fertilizers applications market is forecasted to grow with a CAGR of 4.8% and reach up to 647 thousand metric tons by FY2030.

India’s growing fertilizers market is one of the major drivers for the WNA fertilizers applications market. In FY2020, the Indian fertilizer industry stood at INR 887 billion which is expected to grow at a CAGR of 5.5% in the next five years.

**India Weak Nitric Acid Concentrate Nitric Acid Applications Market, By Volume (Thousand Metric Tons)**

|  |  |
| --- | --- |
| **CAGR FY2015-FY2021** | **CAGR FY2022-FY2030** |
| 0.9% | 6.9% |

*References: TechSci Analysis, Secondary Sources, Primary Interviews*

Weak nitric acid is captively used to manufacture concentrate nitric acid (CNA). 20% of the total market is accounted by CNA applications. The market is growing from 253 thousand metric tons in FY2015 to 267 thousand metric tons in FY2021 with a CAGR of 0.9% during this period. WNA concentrate nitric acid applications market is forecasted to grow with a CAGR of 6.9% and reach up to 491 thousand metric tons by FY2030.

WNA consumption in concentrated nitric acid market is growing on the back of increasing overall CNA market in India. India overall concentrated nitric acid market is expected to grow with a CAGR close to 3.5% in during FY2021 to FY2030.

**India Weak Nitric Acid Strong Nitric Acid Applications Market, By Volume (Thousand Metric Tons)**

|  |  |
| --- | --- |
| **CAGR FY2015-FY2021** | **CAGR FY2022-FY2030** |
| 1.3% | 6.7% |

*References: TechSci Analysis, Secondary Sources, Primary Interviews*

Weak nitric acid is captively used to manufacture strong nitric acid (SNA). 2% of the total market is accounted by SNA applications. The market is growing from 25 thousand metric tons in FY2015 to 27 thousand metric tons in FY2021 with a CAGR of 1.3% during this period. WNA strong nitric acid applications market is forecasted to grow with a CAGR of 6.7% and reach up to 55 thousand metric tons by FY2030.

**3.2 Weak Nitric Acid Market Sales Market**

**India Weak Nitric Acid Market, By Sales, By Volume (Thousand Metric Tons)**

|  |  |  |
| --- | --- | --- |
| **By Sales** | **CAGR FY2015-FY2021** | **CAGR FY2022-FY2030** |
| Captive | 2.4% | 5.0% |
| Merchant | 1.6% | 3.4% |

*References: TechSci Analysis, Secondary Sources, Primary Interviews*

Weak nitric acid captive market stood at 1,066 thousand metric tons as of FY2015 which grew up to be 1,225 thousand metric tons in FY2021 with a CAGR of 2.4%. The market is expected to reach up to 2,074 thousand metric tons by FY2030 with a CAGR of 5.0%.

The merchant sale of weak nitric acid is only about 231 thousand metric tons in FY2021, contributing to only 18% of the total market. Most of the WNA is used by its producers in the vertically integrated production of a wide range of chemical products such as fertilizers, ammonium nitrate, concentrated nitric acid, nitro aromatic compounds, etc.

**3.3 Weak Nitric Acid Region Market**

**West India Weak Nitric Acid Market, By Volume (Thousand Metric Tons)**

|  |  |
| --- | --- |
| **CAGR FY2015-FY2021** | **CAGR FY2022-FY2030** |
| 2.6% | 5.6% |

*References: TechSci Analysis, Secondary Sources, Primary Interviews*

West India contributes to highest market demand in the overall India weak nitric acid market. The high market demand is because of high fertilizers and ammonium nitrate manufacturing in the region. DFPCL and RCF have ammonium nitrate manufacturing facilities at Taloja, and Trombay, respectively.

Gujarat is the largest manufacturer of fertilizers in India accounting to more than 25% of the total production of nitrogenous as well as phosphatic fertilizers of the country. The state has more than 14% of the India's total installed capacity of fertilizers.

The west region has a market share of 37%. West India WNA market is growing from 465 thousand metric tons in FY2015 to 543 thousand metric tons in FY2021 with a CAGR of 2.6% during this period. It is forecasted to grow with a CAGR of 5.6% and reach up to 966 thousand metric tons by FY2030.

**South India Weak Nitric Acid Market, By Volume (Thousand Metric Tons)**

|  |  |
| --- | --- |
| **CAGR FY2015-FY2021** | **CAGR FY2022-FY2030** |
| 2.5% | 5.0% |

*References: TechSci Analysis, Secondary Sources, Primary Interviews*

South India contributes to more than 25% of the total market demand of India weak nitric acid market. The region’s WNA market is growing from 327 thousand metric tons in FY2015 to 378 thousand metric tons in FY2021 with a CAGR of 2.5% during this period. It is forecasted to grow with a CAGR of 5.0% and reach up to 640 thousand metric tons by FY2030.

South India WNA market is growing on the back of high fertilizers manufacturing in the region. Some high fertilizer manufacturing states include Andhra Pradesh, Karnataka, Kerela, Tamil Nadu, etc.

**East India Weak Nitric Acid Market, By Volume (Thousand Metric Tons)**

|  |  |
| --- | --- |
| **CAGR FY2015-FY2021** | **CAGR FY2022-FY2030** |
| 1.7% | 4.1% |

*References: TechSci Analysis, Secondary Sources, Primary Interviews*

East India contributes to more than 20% of the total market demand of India weak nitric acid market. The region’s WNA market is growing from 297 thousand metric tons in FY2015 to 329 thousand metric tons in FY2021 with a CAGR of 1.7% during this period. It is forecasted to grow with a CAGR of 4.1% and reach up to 514 thousand metric tons by FY2030.

**North India Weak Nitric Acid Market, By Volume (Thousand Metric Tons)**

|  |  |
| --- | --- |
| **CAGR FY2015-FY2021** | **CAGR FY2022-FY2030** |
| 1.7% | 3.0% |

*References: TechSci Analysis, Secondary Sources, Primary Interviews*

North India contributes close to 14% of the total market demand of India weak nitric acid market. The region’s WNA market is growing from 186 thousand metric tons in FY2015 to 207 thousand metric tons in FY2021 with a CAGR of 1.7% during this period. It is forecasted to grow with a CAGR of 3.0% and reach up to 294 thousand metric tons by FY2030.

**3.4 Demand and Supply Drivers**

**Demand Drivers**

**Growing Indian Fertilizers Industry:**

The rising fertilizer industry in India is one of the major drivers for weak nitric acid market because the WNA is used captively to manufacture fertilizers. Weak nitric acid is used to manufacture fertilizers such as ammonium nitro phosphate (ANP) fertilizer.

In FY2020, the Indian fertilizer industry stood at INR 887 billion which is expected to grow at a CAGR of 5.5% in the next five years. In FY2020, the total fertilizers market stood at 614 LMT in terms of volume out of which 426 LMT is domestic production.

**Rising demand of Ammonium Nitrate and Explosives:**

Weak Nitric Acid is captively used to manufacture Ammonium Nitrate which in turn is used to manufacture explosives. The Ammonium Nitrate market stood at 874 thousand MT growing at a CAGR of 6.6% between FY2015-FY2021. The market is expected to reach 1,698 thousand MT by FY2030 growing at a CAGR of 7.8%. The demand of ammonium nitrate is constantly growing due to rising demand from end use sectors such as explosives, mining, and construction & infrastructure. The India explosives market has been growing significantly with a CAGR of 8.1% between FY2016-FY2022.

The market has been growing on the back of demand from mining, construction, and road &infrastructure industry. The blasting agent segment is anticipated to grow and maintain dominance in forecast period.

**Growing Chemicals Market:**

Weak nitric acid is used to manufacture an array of chemicals including nitroaromatics, dye & dye intermediates, etc. India chemicals market stood at USD 178 Billion in FY2020 which is expected to reach close to USD 300 Billion by FY2025 with a growth rate of 9.3%. India accounts 2.5% of the total global chemical sales. India also stands at 6th position in terms of imports and 9th position in terms of exports of global chemicals and chemical products.

*References: TechSci Analysis, Secondary Sources, Primary Interviews*

Other factors such as increasing use of nitric acid as a blasting and explosive agent in the mining industry along with growing applications in oxidizer for rocket propellants is driving the demand for weak nitric acid in India. Weak nitric acid is used to manufacture explosives such as nitroglycerin and trinitroglycerin (TNT).

**Supply Drivers**

**Captive Use by Producers:**

Out of the total demand of weak nitric acid in India, approximately 82% is used in captive use accounting to 1,223 thousand metric tons of the total domestic consumption.

To support this captive use of weak nitric acid, the producers are driven to increase their production and operating efficiency. Most of the WNA is used by its producers in the vertically integrated production of a wide range of chemical products such as fertilizers, ammonium nitrate, concentrated nitric acid, nitro aromatic compounds, etc.

The merchant sale of weak nitric acid is only about 264 thousand metric tons, contributing to only 18% of the total market.

**Lesser imports:**

The imports weak nitric acid is very less in India which acts as a major supply driver. As of FY2021 the imports of WNA stood at 26,347 MT which was only 17 MT in FY2015. Owing to the less imports of POI in India, the domestic manufacturers are increasing their operating efficiency and thereby increasing the production.

**Government Regulations:**

Manufacturers across India are seeking to de-risk their supply chains and reduce the dependency on China considering the Government’s Atmanirbhar Bharat.

The Government of India is promoting indigenous production of ammonium nitrate and weak nitric acid to lessen the dependency on Imports through its Atmanirbhar Bharat initiative. Additionally, the GOI has also introduced schemes such as PLI scheme, 100% FDI, mandatory BIS standards, PCPIR policy, National Mineral Policy, etc to ramp up the domestic production of ammonium nitrate and weak nitric acid.

The Union Cabinet chaired by the Prime Minister, Shri Narendra Modi has approved to introduce the production-linked incentive (PLI) scheme in specialty steel with a financial outlay of INR 6,322 Crores for enhancing India’s manufacturing capabilities and enhancing exports, thus increasing demand for industrial explosives in this sector.

100% FDI is allowed under the automatic route in the Chemical industry, except in the case of hazardous chemicals, and in the mining industry leading to increased production.

The GOI has announced the National Mineral Policy 2019 and the Mines and Minerals (Development and Regulation) Amendment Act 2021 in order to uncover a huge mining potential in India and presenting major opportunities for investments in mining sector.

The Government of India has conceptualized PCPIRs (Petroleum, Chemicals and Petrochemical Investment Regions) as clusters that provide investors with a transparent and investment-friendly policy and facility regime. PCPIRs are set up with an intention to increase investments in Chemical sector.

All these policies in turn creates an increased demand for industrial explosives used for blasting applicating in the mines.

Each PCPIR is a specifically delineated region spread over an area of about 250 sq. km. These areas will have manufacturing facilities, along with associated logistics and other services. The required infrastructure along with a non-processing area will be developed, to include residential, commercial and other social and institutional infrastructure. The Ministry of Chemicals & Petrochemicals has set up four PCPIRs in Dahej (Gujarat), Vishakhapatnam-Kakinada (Andhra Pradesh), Paradeep (Odisha), and Cuddalore and Nagapattinam (Tamil Nadu). This has a potential to increase chemicals production in India which would in turn increase the demand for weak nitric acid in India

**3.5 Covid-19 Impact**

The weak nitric acid downstream industry was severely impacted because of Covid-19 pandemic which is turn has impacted its production other than captive use. Deepak Fertilizer is one of the major producers of weak nitric acid; their production at Dahej, Gujarat was impacted because of the Covid-19 pandemic.

Additionally, price margins were eroded for imported fertilizers and raw materials during the pandemic. Many industries and phosphate plants were also shut down in FY2021.

The production has recovered during the second half of FY2021 due to growing demand from end use sectors.

**3.6 Major Consumers of Weak Nitric Acid**

The following are merchant consumers of weak nitric acid.

|  |  |
| --- | --- |
| Consumers | Consumption By Volume, FY2021 |
| Cataler India Auto Parts Pvt Ltd | 40,000 |
| Nihon Parkerizing India Pvt Ltd | 30,000 |
| Ultra International | 21,000 |
| AIC Specialities | 18,000 |
| Orbit Scientific Products | 12,000 |

*References: TechSci Analysis, Secondary Sources, Primary Interviews*

Cataler India Auto Parts Pvt Ltd uses WNA for etching of stainless steel and other metals parts. Nihon Parkerizing India Pvt Ltd uses weak nitric acid for surface treatment purposes. Ultra International, AIC Specialities, and Orbit Scientific Products uses WNA for laboratory purposes such as trace metal testing, etc.

**3.7 Product Movement Practices & Supply Chain Analysis**

**Weak Nitric Acid Product Movement Practices**

* Weak Nitric Acid is commonly transferred in tankers and drums.
* The maximum capacity of drums is 200 liters. The tankers have maximum capacity of 35 MT. Capacity ranges from 10 MT to 35 MT.
* Weak Nitric Acid falls under “Red Category’ as per Ministry of Chemicals of India. Licenses are required for product movement.
* Unlike ammonium nitrate, WNA does not require guards for product movement. The product is transported in normal stainless-steel tankers.

**Supply Chain Analysis**

***Supply Chain 1:***

*Weak nitric acid manufacturers produce WNA and supply it to Fertilizers/Conc. Nitric Acid/Nitroaromatics/Dyes & Paints, etc manufacturers. These manufacturers and supply final products to respective end use industries.*

*Margin:*

*Manufacturer: 8-10%*



*References: TechSci Analysis, Secondary Sources, Primary Interviews*

***Supply Chain 2:***

*Weak nitric acid manufacturers import WNA and supply it to distributors/traders who further supply it to Fertilizers/Conc. Nitric Acid/Nitroaromatics/Dyes & Paints, etc manufacturers. These manufacturers and supply final products to respective end use industries.*

*Margin:*

*Manufacturer: 8-10%*

*Traders/Distributors: 11-13%*



*References: TechSci Analysis, Secondary Sources, Primary Interviews*

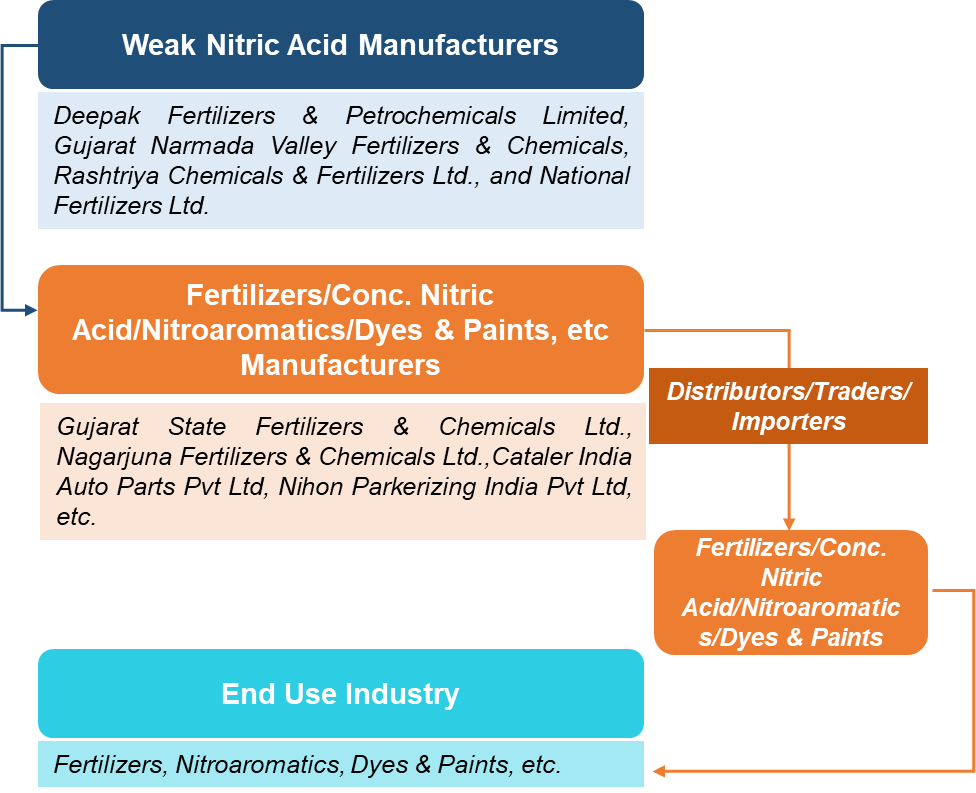
***Supply Chain 3:***

*Weak nitric acid manufacturers produce WNA and supply it to Fertilizers/Conc. Nitric Acid/Nitroaromatics/Dyes & Paints, etc manufacturers. These manufacturers and supply final products traders/distributors who supply to respective end use industries.*

*Margin:*

*Manufacturer: 8-10%*

*Traders/Distributors: 11-13%*

**

*References: TechSci Analysis, Secondary Sources, Primary Interviews*

**3.8 Imports-Exports**

**India Weak Nitric Acid Imports, By Value (INR Crores) & By Volume (Thousand Metric Tons)**

*References: Ministry of Commerce, DGFT*

As of FY2021, the total imports of weak nitric acid stood at 26 thousand metric tons. Import in terms of value is approximately INR 37 Crores.

**India Weak Nitric Acid Market, Import, By country, By Value (INR Crore)**

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Country | 2015 | 2016 | 2017 | 2018 | 2019 | 2020 | 2021 |
| **Korea** | - | - | 6 | 29 | 35 | 28 | 27 |
| **Taiwan** | - | - | - | - | - | - | 4 |
| **Belgium** | 0.2 | 0.3 | 1 | 1 | 2 | 1 | 2 |
| **USA** | 1 | 1 | 1 | 0.4 | 1 | 1 | 1 |
| **Germany** | 1 | 1 | 1 | 2 | 2 | 2 | 1 |

*References: Ministry of Commerce, DGFT*

In terms of value, Korea, Taiwan, Belgium, USA, and Germany are the top five importing countries with imports of INR 27 Crore, INR 4 Crore, INR 2 Crore, INR 1 Crore, and INR 1 Crore, respectively.

**India Weak Nitric Acid Market, Import, By country, By Volume (Metric Tons)**

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Country | 2015 | 2016 | 2017 | 2018 | 2019 | 2020 | 2021 |
| **Korea** | - | - | 3,857 | 27,265 | 36,433 | 29,823 | 23,677 |
| **Taiwan** | - | - | - | - | - | 3 | 2,650 |
| **Belgium** | 1 | 2 | 2 | 8 | 5 | 3 | 5 |
| **Germany** | 3 | 4 | 2 | 3 | 6 | 9 | 3 |
| **China** | - | - | - | - | - | - | 3 |

*References: Ministry of Commerce, DGFT*

In terms of volume, Korea, Taiwan, Belgium, Germany and China are the top five importing countries with imports of 23,677 MT, 2,650 MT, 5 MT, 3 MT, and 3 MT, respectively.

**India Weak Nitric Acid Market, Import, By Consumption Sectors, By Volume (Metric Tons)**

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Country | 2015 | 2016 | 2017 | 2018 | 2019 | 2020 | 2021 |
| **Fertilizers** | 6 | 8 | 1,427 | 9,976 | 13,190 | 10,696 | 9,353 |
| **Ammonium Nitrate** | 5 | 7 | 1,153 | 8,109 | 10,789 | 8,804 | 7,746 |
| **Concentrated Nitric Acid** | 3 | 5 | 803 | 5,638 | 7,484 | 6,093 | 5,348 |
| **Others** | 2 | 3 | 486 | 3,582 | 4,988 | 4,251 | 3,899 |

*Others include Nitroaromatics, Dyes & Paints, Explosives, etc.*

The imported weak nitric acid majorly has applications in fertilizers manufacturing with import volume of 9,353 MT. This is followed by ammonium nitrate manufacturing applications with 7,746 MT of imports. CNA and other applications sectors import 5,348 MT, and 3,899 MT.

**India Weak Nitric Acid Exports, By Value (INR Crores) & By Volume (Thousand Metric Tons)**

*References: Ministry of Commerce, DGFT*

As of FY2021, the total exports of weak nitric acid stood at 12 thousand metric tons. Import in terms of value is approximately INR 31 Crores.

**India Weak Nitric Acid Market, Export, By country, By Value (INR Crore)**

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Country | 2015 | 2016 | 2017 | 2018 | 2019 | 2020 | 2021 |
| **Indonesia** | 4 | 4 | 4 | 6 | 2 | 6 | 9 |
| **United Arab Emirates** | 5 | 3 | 3 | 4 | 4 | 6 | 8 |
| **Kuwait** | 1 | 2 | 2 | 2 | 1 | 2 | 2 |
| **Sri Lanka** | 3 | 2 | 2 | 2 | 1 | 2 | 3 |
| **Oman** | - | 1 | - | - | 1 | 1 | 1 |

*References: Ministry of Commerce, DGFT*

In terms of value, Indonesia, United Arab Emirates, Kuwait, Sri Lanka, and Oman are the top five exporting countries with imports of INR 9 Crore, INR 8 Crore, INR 2 Crore, INR 3 Crore, and INR 1 Crore, respectively.

**India Weak Nitric Acid Market, Export, By country, By Volume (Metric Tons)**

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Country | 2015 | 2016 | 2017 | 2018 | 2019 | 2020 | 2021 |
| **Indonesia** | 2,208 | 2,142 | 2,072 | 3,379 | 1,111 | 2,847 | 3,857 |
| **United Arab Emirates** | 2,264 | 1,577 | 1,332 | 1,812 | 1,744 | 2,473 | 2,737 |
| **Kuwait** | 672 | 714 | 787 | 787 | 563 | 1,021 | 876 |
| **Sri Lanka** | 1,364 | 1,105 | 925 | 1,050 | 467 | 892 | 821 |
| **Oman** | 132 | 269 | 82 | 25 | 427 | 294 | 540 |

*References: Ministry of Commerce, DGFT*

In terms of volume, Indonesia, United Arab Emirates, Kuwait, Sri Lanka, and Oman are the top five exporting countries with exports of 3,857 MT, 2,737 MT, 876 MT, 821 MT, and 540 MT, respectively.

**India Weak Nitric Acid Market, Export, By Consumption Sectors, By Volume (Metric Tons)**

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Country | 2015 | 2016 | 2017 | 2018 | 2019 | 2020 | 2021 |
| **Fertilizers** | 5,496 | 4,343 | 3,504 | 4,863 | 3,300 | 3,908 | 3,635 |
| **Ammonium Nitrate** | 6,296 | 4,993 | 4,043 | 5,632 | 3,836 | 4,560 | 4,256 |
| **Concentrated Nitric Acid** | 2,893 | 2,343 | 1,938 | 2,757 | 1,918 | 2,328 | 2,219 |
| **Others** | 2,331 | 1,910 | 1,597 | 2,293 | 1,608 | 1,966 | 1,886 |

*References: Ministry of Commerce, DGFT*

*Others include Nitroaromatics, Dyes & Paints, Explosives, etc.*

The exported weak nitric acid majorly has applications in fertilizers manufacturing with export volume of 3,635 MT. This is followed by ammonium nitrate manufacturing applications with 4,256 MT of imports. CNA and other applications sectors import 2,219 MT, and 1,886 MT.

**3.9 Pricing Analysis**

**Import-Export Pricing**

**India Import Average Selling Price of Weak Nitric Acid – CIF Price (INR Per Metric Ton)**

|  |  |
| --- | --- |
| Years | INR/Metric Ton |
| 2017 | 23,723 |
| 2018 | 12,573 |
| 2019 | 11,137 |
| 2020 | 11,227 |
| 2021 | 14,010 |
| 2022 | 21,016 |
| 2023 | 20,877 |
| 2024 | 21,408 |
| 2025 | 21,940 |
| 2026 | 22,471 |
| 2027 | 23,002 |
| 2028 | 23,534 |
| 2029 | 24,065 |
| 2030 | 24,596 |

*References: TechSci Analysis, Secondary Sources, Primary Interviews, Ministry of Commerce, DGFT*

*\*DGFT had made entry errors on the public portal for 2015 and 2016. TechSci did not consider these entries for the analysis.*

The prices in FY2015 & FY2016 are steep and so are not included in the graph as it skews the graph and it leads to high drop in prices which is not ideal for forecasting.

**India Import Average Selling Price of Weak Nitric Acid - CIF Price, By Country (INR Per Metric Ton)**

|  |  |  |
| --- | --- | --- |
| Country | 2020 | 2021 |
| **Korea** | 9,401 | 11,327 |
| **Taiwan** | 111,765 | 15,434 |
| **Belgium** | 4,221,893 | 3,584,701 |
| **USA** | 781,530 | 3,520,973 |

*References: TechSci Analysis, Secondary Sources, Primary Interviews, Ministry of Commerce, DGFT*

**India Export Average Selling Price of Weak Nitric Acid - FOB Price (INR Per Metric Ton)**

|  |  |
| --- | --- |
| Years | INR/Metric Ton |
| 2015 | 20,693 |
| 2016 | 21,728 |
| 2017 | 22,664 |
| 2018 | 19,620 |
| 2019 | 25,081 |
| 2020 | 22,642 |
| 2021 | 26,032 |
| 2022 | 33,842 |
| 2023 | 23,689 |
| 2024 | 18,951 |
| 2025 | 25,045 |
| 2026 | 25,482 |
| 2027 | 25,920 |
| 2028 | 26,357 |
| 2029 | 26,794 |
| 2030 | 27,231 |

*References: TechSci Analysis, Secondary Sources, Primary Interviews, Ministry of Commerce, DGFT*

**India Export Average Selling Price of Weak Nitric Acid - FOB Price, By Country (INR Per Metric Ton)**

|  |  |  |
| --- | --- | --- |
| Country | 2020 | 2021 |
| **Indonesia** | 20,403 | 23,161 |
| **United Arab Emirates** | 23,529 | 28,985 |
| **Kuwait** | 22,980 | 24,607 |
| **Sri Lanka** | 24,332 | 30,583 |
| **Oman** | 22,649 | 26,401 |

*References: TechSci Analysis, Secondary Sources, Primary Interviews, Ministry of Commerce, DGFT*

**Ex-Factory Pricing**

**India Ex-Factory Average Selling Price of Weak Nitric Acid (INR Per Metric Ton)**

|  |  |
| --- | --- |
| Years | INR/Metric Ton |
| 2015 | 21,237 |
| 2016 | 22,724 |
| 2017 | 24,087 |
| 2018 | 19,270 |
| 2019 | 21,582 |
| 2020 | 19,483 |
| 2021 | 20,652 |
| 2022 | 28,913 |
| 2023 | 24,256 |
| 2024 | 24,633 |
| 2025 | 25,009 |
| 2026 | 25,386 |
| 2027 | 25,763 |
| 2028 | 26,140 |
| 2029 | 26,517 |
| 2030 | 26,893 |

*References: TechSci Analysis, Secondary Sources, Primary Interviews, Ministry of Commerce, DGFT*

|  |  |
| --- | --- |
| **Net Price After Discount & Cash Rebate (INR/MT)** | **28,493** |

There is a cash rebate & discount of INR 420/MT in case there is advance payment made. The net price after discount is INR 28,493 per MT.

**Weak Nitric Acid Ex-Factory Price, By Grade**

|  |  |
| --- | --- |
| Grade | INR/Metric Ton |
| Nitric Acid 68% | 28,913 |
| Nitric Acid 61.5% | 26,022 |
| Nitric Acid 58% | 22,118 |

*References: TechSci Analysis, Secondary Sources, Primary Interviews, Ministry of Commerce, DGFT*

Weak nitric acid 68%, weak nitric acid 61.5%, and weak nitric acid 58% are most used weak nitric acid grades in the market. The manufacturers of WNA offer several other product grades such as 33%, 59%, 72%, 54%, 60%. However, these grades only contribute to a very small portion of the market. Weak Nitric Acid 68% grade is the most prominent in the market and it contributes to more than 90% of the total market.

The price of 33% WNA is INR 10,560 as of October 2021.

**Regression: Weak Nitric Acid and Ammonia Price**

|  |  |  |
| --- | --- | --- |
| Year | Ammonia Price | Ammonium Nitrate |
| 2015 | 30480 | 21237 |
| 2016 | 29210 | 22724 |
| 2017 | 27486 | 24087 |
| 2018 | 29760 | 19270 |
| 2019 | 30250 | 21582 |
| 2020 | 31810 | 19482 |
| 2021 | 35130 | 20652 |

|  |  |
| --- | --- |
| SUMMARY OUTPUT | |
|  |  |
| *Regression Statistics* | |
| Multiple R | 0.57425 |
| R Square | 0.329764 |
| Adjusted R Square | 0.162204 |
| Standard Error | 1723.15 |
| Observations | 6 |

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| ANOVA |  |  |  |  |  |
|  | *df* | *SS* | *MS* | *F* | *Significance F* |
| Regression | 1 | 5843607 | 5843607 | 1.968043 | 0.233308 |
| Residual | 4 | 11876989 | 2969247 |  |  |
| Total | 5 | 17720596 |  |  |  |

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | *Coefficients* | *Standard Error* | *t Stat* | *P-value* | | *Lower 95%* | | *Upper 95%* | | *Lower 95.0%* | | *Upper 95.0%* | |
| Intercept | 33906.96 | 9014.397 | 3.761423 | | 0.019751 | | 8878.979 | | 58934.94 | | 8878.979 | | 58934.94 |
| 30480 | -0.41191 | 0.293616 | -1.40287 | | 0.233308 | | -1.22711 | | 0.403304 | | -1.22711 | | 0.403304 |

|  |  |  |
| --- | --- | --- |
| RESIDUAL OUTPUT | |  |
|  |  |  |
| *Observation* | *Predicted 21237* | *Residuals* |
| 1 | 21875.21 | 848.7938 |
| 2 | 22585.33 | 1501.669 |
| 3 | 21648.66 | -2378.66 |
| 4 | 21446.82 | 135.1752 |
| 5 | 20804.25 | -1322.25 |
| 6 | 19436.73 | 1215.273 |

|  |  |
| --- | --- |
| PROBABILITY OUTPUT | |
|  |  |
| *Percentile* | *21237* |
| 8.333333 | 19270 |
| 25 | 19482 |
| 41.66667 | 20652 |
| 58.33333 | 21582 |
| 75 | 22724 |
| 91.66667 | 24087 |

TechSci used various techniques to understand the price trend, correlation and forecast supported with primary interview among key suppliers

**Linear Regression**

* Linear regression is a statistical technique that examines the linear relationship between a dependent variable and one or more independent variables.
* Linear relationship means the change in an independent variable(s) causes a change in the dependent variable.
* Positive Linear Relationship: When the independent variable increases, the dependent variable increases too.
* Negative Linear Relationship: When the independent variable increases, the dependent variable decreases.
* Linear Regression suggested to know the relationship between— Ammonia and Ammonium Nitrate, Ammonium Nitrate and Weak Nitric Acid, Ammonia and Weak Nitric Acid at 95% confidence level
* R Square values were positive with a varying degree in all possible propositions, indicating a positive linear relationship but it was not closer to 1. It indicates that there are various factors too which impact more on price.

**Exponential Smoothing (Based on Past Data)**

Exponential smoothing forecasting is based on the AAA version (additive error, additive trend, and additive seasonality) of the Exponential Triple Smoothing (ETS) algorithm, which smoothest out minor deviations in past data trends by detecting seasonality patterns and confidence intervals.

TechSci used the Exponential Smoothing while considering the price forecast and Primary interviews from the industry shown the confidence on the output

**Factors Affecting Prices:**

Ammonia is the main raw material used to produce weak nitric acid which in turn is used to manufacture ammonium nitrate. Many weak nitric acid manufacturers also manufacture their own ammonia supply to vertically integrate production.

As of FY2019, India imported INR 9,451 Crore of Ammonia, becoming the first largest importer of Ammonia in the world. India imports Ammonia primarily from: Saudi Arabia (INR 5,221 Crore), Qatar (INR 1,093 Crore), Indonesia (INR 672 Crore), Egypt (INR 576 Crore), and Russia (INR 573 Crore).

Although ammonia producers use a variety of purchasing options to manage the volatility of natural gas, the prices are still impacted.

Ammonia prices vary monthly and are heavily impacting the ammonia nitrate and weak nitric acid market. Recently there has been a disruption of natural gas supply chain in Europe which is impacting the market prices. Natural gas prices have risen sharply globally in the recent months are record high prices. These high prices are due to the factors such as increased demand particularly from Asia due to a post-pandemic recovery; low gas inventories; and lesser-than-usual gas supplies from Russia. In Europe, the prices have risen more than 250% in FY2022 (up to October 2021). Asia has witnessed an increase of 175% since January 2021 end. In the coming winter months, the gas stocks are expected to be much lower than usual in Europe thus the supply pressure is high. Owing to transmission issues, pipeline issues, production issues, etc. gas prices have moved up and most of the ammonia complexes have been shut down in Europe because of not being able to withstand the gas prices.

Norway based Yara International is one of the largest manufacturers of fertilizers is cutting off 40% of its European ammonia production due to high gas prices. It has a European output capacity of 4.9 million Tons per annum out of which 2 million Tons would be impacted.

Similarly, U.S.-based CF Industries Holdings Inc is also planning to halt operations at its two UK plants because of high natural gas prices.

As a result of this ammonia prices have moved up to 900 Dollar which otherwise is 300-400 dollar. Because of this, Europe depends on higher cost imported ammonia, thus FGAN (the imported grade of ammonium nitrate) prices have moved up significantly. Previously it was 180-190 dollar which reached up to 250-300 dollar from Jan-Aug. In Sept and Oct, it is traded more than 600 dollars.

These prices are expected to be high until February 2022. March 2022 onwards prices are expected to stabilize as supply will restore from Russia.

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**DETAILED**

**COMPANY PROFILES**

Text

Description automatically generated**4.1 Deepak Fertilizers and Petrochemicals Corporation Limited (DFPCL)**

**Head Office Location:** Maharashtra, India

**Business Overview:** Deepak Fertilizers and Petrochemicals Corporation Limited is a manufacturer of Industrial Chemicals (Nitric Acid, Iso Propyl Alcohol, Methanol and Carbon Dioxide) Crop Nutrition (Nitro Phosphate, Nitrogen Phosphorous Potassium variants, Water Soluble Fertilizers and Bentonite Sulphur) and Technical Ammonium Nitrate (Mining Chemicals).

The company exports products to more than 27 countries across 6 continents and manufacturing facilities in Taloja (Maharashtra), Srikakulam (Andhra Pradesh), Panipat (Haryana) and Dahej (Gujarat).

As of FY 2020-2021 Deepak Fertilizers generated a revenue of INR 5,808 Crores.

DFPCL’s wholly owned subsidiary Smartchem Technologies Limited (STL) is responsible for manufacturing of Technical Grade Ammonium Nitrate. As of FY 2020-2021, STL has generated a revenue of INR 3,908 Crore.

**Product Segments:** The company operates in four major business segments, namely, industrial chemicals, agri-business (fertilizers), mining services and consultation, and value-added real estate (VARE).

* Industrial Chemicals: Iso Propyl Alcohol, Methanol, Ammonium Nitrate (AN), Dilute Nitric Acid (DNA), Strong Nitric Acid (SNA), Concentrated Nitric Acid (CNA), Propane, Carbon-di-oxide (CO2), Hydrogen (H2)
* Agri-business (Fertilisers): Nitro Phosphate (NP) 24:24:0, Bentonite Sulphur, bio-fertilisers, water soluble fertilisers, soil nutrients and select mixtures
* Mining Services and Consultation: Technical Ammonium Nitrate. Provider of holistic mining services end-to-end solution in geology, mine consulting and contract mining.

**Manufacturing and Plant Details:**

**Technical Ammonium Nitrate:**

|  |  |
| --- | --- |
| Location | Installed Capacity (Thousand Metric Tons Per Annum) |
| Taloja, Maharashtra | 444 |
| Srikakulam, Andhra Pradesh | 43 |
| Gopalpur, Odisha (Planned) | 376 |

*References: TechSci Analysis, Secondary Sources, Primary Interviews*

**Weak Nitric Acid:**

|  |  |
| --- | --- |
| Location | Installed Capacity (Thousand Metric Tons Per Annum) |
| Taloja, Maharashtra | 685 |
| Dahej, Gujarat | 148 |
| Srikakulam, Andhra Pradesh | 56 |

*References: TechSci Analysis, Secondary Sources, Primary Interviews*

**Revenue and Other Key Financial Details:**

|  |  |  |
| --- | --- | --- |
| Particulars | FY2020-2021 | FY2019-2020 |
| **Revenue** | **4,685** | **5,808** |
| **Profit Before Tax** | **588** | **103** |
| **% Margin** | **13%** | **2%** |
| **Profit After Tax** | **406** | **89** |
| **% Margin** | **9%** | **2%** |

*References: Annual Report*

*References: Annual Report*

**Ammonium Nitrate:**

|  |  |  |
| --- | --- | --- |
| Particulars | FY2020-2021 | FY2019-2020 |
| Production (Thousand Metric Tons Per Annum) | 424 | 440 |
| Market Share – By Production (%) | 57% | 63% |
| Market Share – By Volume (Domestic Consumption) (%) | 46% | 47% |

*References: TechSci Analysis, Secondary Sources, Primary Interviews*

**Weak Nitric Acid:**

|  |  |  |
| --- | --- | --- |
| Particulars | FY2020-2021 | FY2019-2020 |
| Production (Thousand Metric Tons Per Annum) | 626 | 654 |
| Market Share – By Production (%) | 43% | 42% |
| Market Share – By Volume (Domestic Consumption) - Merchant (%) | 23% | 26% |

*References: TechSci Analysis, Secondary Sources, Primary Interviews*

**Ammonium Nitrate (AN):**

Deepak Fertilizers is the only manufacturer of explosive grade low density prilled ammonium nitrate. It is the 5th largest single ammonium nitrate manufacturing company globally producing High Density Ammonium Nitrate (HDAN), Low Density Ammonium Nitrate (LDAN) and Ammonium Nitrate Melt (AN Melt).

UDHE, Germany is the technology provider for Deepak Fertilizers’ biggest manufacturing plant at Taloja. For Low Density Ammonium Nitrate (LDAN), Stamicarbon (The Netherlands) is the technology provider for DFPCL. Additionally, it also has partnerships with Norsk Hydro (Sweden), and Grande Paroisse (France).

DFPCL caters to mining, infrastructure, and pharmaceutical sectors and the principal markets are private coal, limestone, and the quarrying/construction industries.

The company has maintained strong market presence in the ammonium nitrate segment due to the below mentioned strengths:

* Have downstream tie-ups to provide value added products.
* Have associations with growing private coal mining segment.
* Have down-the hole (DTH) last-mile delivery systems.
* Adopted increased deployment of rail transportation for product movement from plants to customers, ensuring business continuity during Covid-19.
* Floated incentive schemes to encourage transport service providers to priorities trucks placement.
* Maintained business during Covid-19 through competitive pricing, increased focus on high margin products, lower raw material prices and overhead cost control measures.
* Only supplier of TAN solids in India with extensive licensed TAN storage and extensive distribution network.

DFPCL offers following products under the ammonium nitrate segment:

* Low Density Porous Prill Ammonium Nitrate: It is used in manufacturing of ANFO and Heavy ANFO product having applications in opencast mining and construction projects.
  + Brands Offered: OPTIMEX, OPTIMEX-PLUS, VERTEX SUPER
* High Density Uncoated Prill Ammonium Nitrate: It is the major raw material for manufacturing high quality emulsion and Slurry explosive. HDAN is also used as an ingredient in emulsion matrix.
  + Brands Offered: OPTIFORM, VERTEX NORMA
* Medical Grade Uncoated Prill Ammonium Nitrate: It is used by nitrous oxide manufacturers.
  + Brands Offered: OPTISPAN, VERTEX SUPREME
* Ammonium Nitrate Solution/Ammonium Nitrate Melt (ANSOL): It is used to produce ammonium nitrate-based emulsion products.
* Coated Prilled Ammonium Nitrate
* Crystalline Ammonium Nitrate

Some of DFPCL’s customers include Solar Explosives, IEL, IDL, IDEAL, PEL, KEL, ACC Cement, UTCL Cement, Dalmia, JK Cement, Penna Cement, Hindustan Zinc Limited, National Aluminum Company Limited, BALCO, HINDALCO, etc.

**Pharmaceuticals Grade Ammonium Nitrate Characteristics**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Parameter | Method | UOM | Specification | |
| **Min** | **Max** |
| PH Dilution | PH Meter |  | 4.8 | --- |
| Moisture | Karl Fisher Titration | % by wt | -- | 1 |
| Purity (NH4NO3) | Titration | % By Wt | 99 | ---- |
| Chlorides (as Cl) | Turbidimetry | PPM | --- | 10 |
| Sulphates (asH2SO4) | Turbidimetry | PPM | --- | 240 |
| Nitrites (NH4NO2) | Titration | PPM |  | NIL |
| Non-Volatile matter | Gravimetric | PPM | --- | 500 |
| Organic Matter | Gravimetric | PPM | --- | NIL |
| Solubility in Water | Visual | --- |  | Clear |
| Iron | Calorimeter | PPM |  | 5 |
| Effect of Heat at 2000 C | Visual |  |  | No Color& Frothing |

Pharmaceuticals grade ammonium nitrate is available in 25 kg ,50 kg ,100kg, 1000 kg and1200 kg bags. The bags are made of laminated HDPE woven fabric bags with inner Liners made of LDPE. The bags are packed after thermal heat sealing of liners and stitched with HDPE which provides protection from weather and handling in transportation, sustaining its quality at user end.

**DFPCL Ammonium Nitrate Market, Installed Capacity, By Volume (Thousand Metric Tons) (FY2015-FY2030)**

*References: TechSci Analysis, Secondary Sources, Primary Interviews*

DFPCL installed capacity of technical ammonium nitrate grew from 485 thousand metric tons in FY2015 to 487 thousand metric tons in FY2021. The installed capacity is expected to reach up to 974 thousand metric tons by FY2030. This increase is because of planned capacity expansion at Gopalpur, Odisha. The plant is expected to have the capacity of 376 thousand metric tons.

**DFPCL Ammonium Nitrate Market, Production, By Volume (Thousand Metric Tons) (FY2015-FY2030)**

Deepak Fertilizer’s production grew from 304 thousand metric tons in FY2015 to 424 thousand metric tons in FY2021. The production is expected to reach up to 819 thousand metric tons by FY2030. Through initiatives such as Make in India and Atmanirbhar Bharat, the Government of India is supporting DFPCL to increase its production.

*References: TechSci Analysis, Secondary Sources, Primary Interviews*

**DFPCL Ammonium Nitrate Market, Operating Efficiency (%) (FY2015-FY2030)**

*References: TechSci Analysis, Secondary Sources, Primary Interviews*

In FY2015, DFPCL was operating at an efficiency of 63% which reaches up to 87% in FY2021. The company recorded its highest operating efficiency of 104% in FY2019. In the forecast period the company is expected to achieve up to 84% operating efficiency.

**Weak Nitric Acid (WNA):**

DFPCL has weak nitric acid manufacturing at Dahej, Taloja and Srikakulam locations, which makes it the only producer in India to supply WNA from multiple facilities.

Weak Nitric Acid is mainly used for production of ammonium nitrate. Approximately 87% of the company’s WNA production is used for captive consumption.

For their weak nitric acid business, the company caters to industries such as fertilizers, explosives, pharmaceuticals, nitro aromatics, dyes, steel rolling industry and defense.

Weatherly Inc. (U.S.A.) is the technology provider for Deepak Fertilizers for weak nitric acid.

Some common grades of weak nitric acid produced by the company are: 60% DNA (WNA), 61.5% DNA (WNA), 33% DNA (WNA), and 59% DNA (WNA).

The price of 33% WNA is INR 10,560 as of October 2021.

**DFPCL Weak Nitric Acid Market, Installed Capacity, By Volume (Thousand Metric Tons) (FY2015-FY2030)**

*References: TechSci Analysis, Secondary Sources, Primary Interviews*

DFPCL installed capacity of weak nitric acid grew from 703 thousand metric tons in FY2015 to 889 thousand metric tons in FY2021. The installed capacity is expected to be 1,186 thousand metric tons by FY2030.

**DFPCL Weak Nitric Acid Market, Production, By Volume (Thousand Metric Tons) (FY2015-FY2030)**

*References: TechSci Analysis, Secondary Sources, Primary Interviews*

Deepak Fertilizer’s weak nitric acid production grew from 429 thousand metric tons in FY2015 to 626 thousand metric tons in FY2021. The production is expected to reach up to 958 thousand metric tons by FY2030. Through initiatives such as Make in India and Atmanirbhar Bharat, the Government of India is supporting DFPCL to increase its production.

Around 87% of the WNA produced by the company is used for captive consumption.

**DFPCL Weak Nitric Acid Market, Operating Efficiency (%) (FY2015-FY2030)**

In FY2015, DFPCL was operating at an efficiency of 61% which reaches up to 70% in FY2021. The company recorded its highest operating efficiency of 91% in FY2018. In the forecast period the company is expected to achieve up to 81% operating efficiency.

*References: TechSci Analysis, Secondary Sources, Primary Interviews*

**Key Developments & Planned Expansions:**

* The company is planning capacity increment of 376 kilo tons per annum at Gopalpur, Odisha (East Coast). The plant is expected to commission by Q4 FY24 to cater to east and adjoining central regions.
* Deepak Fertilizers also initiated debottlenecking to increase technical ammonium nitrate installed capacity by 25% at Taloja manufacturing plant.
* It is connecting with end consumers directly and introducing new value-added products by forward integration.
* It is currently working with customers to deploy a technology for using waste oil from the mines and reprocessing it to use with Low Density ammonium nitrate for manufacturing ANFO having blasting applications.
* The company is also working to deploy specially designed Bulk Mixing and Delivery (BMD) trucks to deliver ANFO and High Energy Emulsion blend bulk explosives directly into the blast hole in mines.
* DFPCL’s weak nitric acid manufacturing plant at Dahej has crossed capacity utilization of 90% in FY 2020-2021. The company is further planning to improve efficiency and capacity utilization. The plant has a manufacturing capacity of 148 kilo tons per annum for weak nitric acid. It caters to DNA requirements of fragmented markets in Central and North India from Dahej.
* DFPCL is also working towards mechanical completion of ammonia (a raw material for weak nitric acid) plant at Taloja, Maharashtra which will lead to zero dependence on imports or domestic third-party ammonia suppliers. This plant is expected to be completed by Q4 FY23 and to have an installed capacity of 500 kilo tons per annum.
* In FY 2019-2020, DFPCL introduced two new grades of weak nitric acid, which are 61.5% DNA (WNA) and 33% DNA (WNA).
* The company is working with a proposal with NIIK Russia for capacity enhancement of its weak nitric acid manufacturing plants and for improving concentration of Nitric Acid in these plants.

Logo

Description automatically generated**4.2 Gujarat Narmada Valley Fertilizers & Chemicals Limited (GNFC)**

**Head Office Location:** Gujarat, India

**Business Overview:** Gujarat Narmada Valley Fertilizers & Chemicals Limited was established in 1976 and has headquarters in Bharuch, Gujarat. The company started its manufacturing and marketing operations in 1982. GNFC has manufacturing units in Bharuch, Gujarat.

The company sells its products under the Narmada brand name.

As of FY 2020-2021, GNFC generated a revenue of INR 5,366 Crores.

**Product Segments:** GNFC has three major business reporting segments, which are Fertilizers, Industrial Chemicals and Others.

* Fertilizers: Urea, Nitrophosphate, Neem De-oiled Cake, Narmada Neem Pesticides, Diammonium Phosphate, Muriate of Potash, Single Super Phosphate, and City Compost.
* Industrial Chemicals: Aniline, Methanol, Acetic Acid, Ethyl Acetate, CNA, WNA, AN-Melt, Toluene Di – isocyanate, Formic Acid, Methyl Formate, Calcium Carbonate, Nitrobenzene, Catsol, Technical Grade Urea, others.
* Others: IT Division

**Manufacturing and Plant Details:**

**Technical Ammonium Nitrate:**

|  |  |
| --- | --- |
| Location | Installed Capacity (Thousand Metric Tons Per Annum)- FY2021 |
| Bharuch, Gujarat | 229 |

*References: TechSci Analysis, Secondary Sources, Primary Interviews*

**Weak Nitric Acid:**

|  |  |
| --- | --- |
| Location | Installed Capacity (Metric Tons Per Annum) - FY2021 |
| Bharuch, Gujarat | 348 |

*References: TechSci Analysis, Secondary Sources, Primary Interviews*

**Revenue and Other Key Financial Details:**

|  |  |  |
| --- | --- | --- |
| Particulars | FY2020-2021 | FY2019-2020 |
| **Revenue** | **5,366** | **5,315** |
| **Profit Before Tax** | **948** | **425** |
| **% Margin** | **18%** | **8%** |
| **Profit After Tax** | **689** | **499** |
| **% Margin** | **13%** | **9%** |

*References: Annual Report*

*References: Annual Report*

**Ammonium Nitrate:**

|  |  |  |
| --- | --- | --- |
| Particulars | FY2020-2021 | FY2019-2020 |
| Production (Thousand Metric Tons Per Annum) | 160 | 103 |
| Market Share – By Production (%) | 22% | 15% |
| Market Share – By Volume (Domestic Consumption) - Merchant (%) | 17% | 19% |

**Weak Nitric Acid:**

|  |  |  |
| --- | --- | --- |
| Particulars | FY2020-2021 | FY2019-2020 |
| Production (Thousand Metric Tons Per Annum) | 393 | 441 |
| Market Share – By Production (%) | 27% | 28% |
| Market Share – By Volume (Domestic Consumption) (%) | 28% | 32% |

*References: TechSci Analysis, Secondary Sources, Primary Interviews*

**Ammonium Nitrate:**

Gujarat Narmada Valley Fertilizers & Chemicals Limited manufactures ammonium nitrate in melted form also called AN melt.

GNFC uses the UDHE technology for its ammonium nitrate melt (AN melt) production. Due to less calcium content this product is best suited for explosives manufacturing applications.

Other applications of AN melt include Pyrotechnics, Herbicides and Insecticides, as an Absorbent, Ingredient of Freezing Mixture, Nutrient for Antibiotics and Yeast.

The product is supplied in insulated stainless steel containers.

Specification of GNFC’s AN melt product:

|  |  |
| --- | --- |
| Concentration as Ammonium Nitrate | 85% by wt. min |
| Calcium as CaO | 0.5% by wt. max. |
| pH of 10% solution | 5-7 |
| Specific Gravity | 1.36 |

**GNFC Ammonium Nitrate Market, Installed Capacity, By Volume (Thousand Metric Tons) (FY2015-FY2030)**

*References: TechSci Analysis, Secondary Sources, Primary Interviews*

**GNFC Ammonium Nitrate Market, Production, By Volume (Thousand Metric Tons) (FY2015-FY2030)**

*References: TechSci Analysis, Secondary Sources, Primary Interviews*

GNFC’s production of ammonium nitrate grew from 160 thousand metric tons in FY2015 and remained the same in FY2021 while observing a dip to 103 thousand metric tons in FY2020. The production is expected to reach up to 194 thousand metric tons by FY2030. Through initiatives such as Make in India and Atmanirbhar Bharat, the Government of India is supporting GNFC to increase its production.

**GNFC Ammonium Nitrate Market, Operating Efficiency (%) (FY2015-FY2030)**

*References: TechSci Analysis, Secondary Sources, Primary Interviews*

In FY2015, GNFC was operating at an efficiency of 70% which remains the same in FY2021. The company recorded its highest operating efficiency of 74% in FY2019. In the forecast period the company is expected to achieve up to 85% operating efficiency.

**Weak Nitric Acid:**

GNFC manufactures weak nitric acid of three grades, which are 61.5% WNA, 68% WNA, and 72% WNA. It employs technology from UDHE, Germany for production of weak nitric acid.

Weak nitric acid manufactured by GNFC is widely used for manufacturing products such as Ammonium Nitrate and other explosives, concentrated nitric acid, Sodium Nitrate, Potassium Nitrate, Calcium Nitrate, Glyoxal, H-Acid, Nitrobenzene and other Nitro Derivatives, Dyes and Dye Intermediates, Drugs and Pharmaceuticals, Pickling of Steel and Metallurgy, Acrylic Fiber, Pesticides, etc.

The product is supplied in stainless steel tankers.

Specification of GNFC’s WNA product:

|  |  |
| --- | --- |
| HNO3 concentration | 61.5 ± 0.5% by wt. 68%, 72% |
| Nitrous Oxide as HNO2 | 500 ppm max. |
| Chloride as Cl | 10 ppm max. |
| Sulphate as H2SO4 | 50 ppm max. |
| Arsenic as As | 2 ppm max. |
| Residue on Ignition | 100 ppm max. |
| Specific Gravity | 1.368 at 25°C |

**GNFC Weak Nitric Acid Market, Installed Capacity, By Volume (Thousand Metric Tons) (FY2015-FY2030)**

*References: TechSci Analysis, Secondary Sources, Primary Interviews*

**GNFC Weak Nitric Acid Market, Production, By Volume (Thousand Metric Tons) (FY2015-FY2030)**

*References: TechSci Analysis, Secondary Sources, Primary Interviews*

WNA production of GNFC was approximately 425 thousand metric tons in FY2015 which decreased to 393 thousand metric tons in FY2021. The production is expected to reach up to 436 thousand metric tons by FY2030.

**GNFC Weak Nitric Acid Market, Operating Efficiency (%) (FY2015-FY2030)**

*References: TechSci Analysis, Secondary Sources, Primary Interviews*

In FY2015, GNFC was operating at an efficiency of 122% which reaches up to 113% in FY2021. The company recorded its highest operating efficiency of 127% in FY2020. By FY2030 the company is expected to achieve up to 125% operating efficiency.

**Key Developments & Planned Expansions:**

* GNFC is seeking to de-risk the supply chain by reducing their dependency on China
* The company has entered Long/Mid Term / Annual Contracts / Agreements for the supply of raw materials.
* The company is also exploring trading opportunities.
* GNFC is planning a capacity expansion for ammonia manufacturing by installing Ammonia Make-up Gas Convertor Loop [AMUGL], in existing Ammonia Synthesis loop. This is expected to increase the manufacturing capacity by 50,000 MT per annum which will be used for Weak Nitric Acid and Ammonium Nitrate Plants.

Icon

Description automatically generated**4.3 Rashtriya Chemicals & Fertilizers (RCF)**

**Head Office Location:** Mumbai, India

**Business Overview:** Rashtriya Chemicals and Fertilizers Limited (RCFL) was established in 1978 and has headquarters in Mumbai, Maharashtra. It is one of the major fertilizer manufacturing companies with 75% of its equity held by Government of India.

RCF has two manufacturing units in Trombay, Mumbai and Thal, Raigad. The company manufactures Urea, Complex Fertilizers, Bio-fertilizers, Micro-nutrients, 100 per cent water soluble fertilizers, soil conditioners and Industrial Chemicals.

As of FY 2020-2021, RCF generated a revenue of INR 8,281 Crores.

**Product Segments:** Rashtriya Chemicals and Fertilizers operate under three business segments, namely, fertilizers, trading, and industrial chemicals.

* Fertilizers: Urea, Complex Fertilizers, Bio-fertilizers, Micro-nutrients, 100 per cent water soluble fertilizers, soil conditioners.
* Industrial Chemicals: Methanol, Concentrated Nitric Acid, Dilute Nitric Acid, Strong Nitric Acid, Ammonium Nitrate Melt, Ammonium Bicarbonate, Sodium Nitrate, Mono Methlyamine, etc.

**Manufacturing and Plant Details:**

**Ammonium Nitrate**

|  |  |
| --- | --- |
| Location | Installed Capacity (Thousand Metric Tons Per Annum)-FY2021 |
| Trombay, Mumbai | 198 |

**Weak Nitric Acid**

|  |  |
| --- | --- |
| Location | Installed Capacity (Thousand Metric Tons Per Annum) -FY2021 |
| Trombay, Mumbai | 396 |

*References: TechSci Analysis, Secondary Sources, Primary Interviews*

**Revenue and Other Key Financial Details:**

|  |  |  |
| --- | --- | --- |
| Particulars | FY2020-2021 | FY2019-2020 |
| **Revenue** | **8,281** | **9,698** |
| **Profit Before Tax** | **516** | **203** |
| **% Margin** | **6%** | **2%** |
| **Profit After Tax** | **373** | **208** |
| **% Margin** | **5%** | **2%** |

*References: Annual Report*

*References: Annual Report*

**Ammonium Nitrate:**

|  |  |  |
| --- | --- | --- |
| Particulars | FY2020-2021 | FY2019-2020 |
| Production (Thousand Metric Tons Per Annum) | 149 | 149 |
| Market Share – By Production (%) | 20% | 21% |
| Market Share – By Volume (Domestic Consumption) (%) | 15% | 17% |

**Weak Nitric Acid:**

|  |  |  |
| --- | --- | --- |
| Particulars | FY2020-2021 | FY2019-2020 |
| Production (Thousand Metric Tons Per Annum) | 368 | 372 |
| Market Share – By Production (%) | 25% | 24% |
| Market Share – By Volume (Domestic Consumption) (%) | 11% | 15% |

*References: TechSci Analysis, Secondary Sources, Primary Interviews*

**Ammonium Nitrate:**

Rashtriya Chemicals & Fertilizers manufactures ammonium nitrate in melted form also called AN melt. The ammonium nitrate melt is mainly catering to explosives industry.

RCF generated a revenue of INR 362 Crores from ammonium nitrate in FY2020-2021. Additionally, the company recorded approximately sales of 1.4 Lakh MT of ammonium nitrate in the current fiscal year.

Specification of RCF’s AN melt product:

|  |  |
| --- | --- |
| Concentration as Ammonium Nitrate | 80 % min. |
| Temp | 90°C |
| pH | 4.5-5.5 |
| CaO | 3000 ppm max. |

Ammonium Nitrate Solution is transported in stainless steel insulated tankers. The company uses ODDA process of Stamicarbon Technologies.

**RCF Ammonium Nitrate Market, Installed Capacity, By Volume (Thousand Metric Tons) (FY2015-FY2030)**

*References: TechSci Analysis, Secondary Sources, Primary Interviews*

RCF has an annual installed capacity 198 thousand metric tons for ammonium nitrate.

**RCF Ammonium Nitrate Market, Production, By Volume (Thousand Metric Tons) (FY2015-FY2030)**

*References: TechSci Analysis, Secondary Sources, Primary Interviews*

RCF’s production grew from 102 thousand metric tons in FY2015 to 149 thousand metric tons in FY2021. The production is expected to reach up to 188 thousand metric tons by FY2030. The company is planning to operate at 95% capacity resulting in increased production.

**RCF Ammonium Nitrate Market, Operating Efficiency (%) (FY2015-FY2030)**

*References: TechSci Analysis, Secondary Sources, Primary Interviews*

In FY2015, RCF was operating at an efficiency of 51% which reaches up to 75% in FY2021. In the forecast period the company is expected to achieve 95% operating efficiency at its Trombay, Mumbai manufacturing plant.

**Weak Nitric Acid:**

RCF manufactures weak nitric acid of 58% WNA grade. The company caters industries such as explosives, drugs, dyes, pharmaceuticals, and jewelry.

Rashtriya Chemicals & Fertilizers generated a revenue of approximately INR 90 Crore from the weak nitric acid segment in FY2020-2021.

Specification of RCF’s WNA product:

|  |  |
| --- | --- |
| Nitric Acid (HNO3) | 58% by wt. min. |
| Nitrous Acid (HNO2) | 0.050% by wt. max. |
| Chlorides (as Cl) | 0.002% by wt. max. |
| Sulphates (as SO4) | 0.0002% by wt. max. |
| Iron (Fe) | 0.0003% by wt. max. |
| Residue | 0.010% max. |
| Arsenic (AS2O3) | <0.1 ppm max. |
| Heavy Metals (as lead) | Negligible (passes test) |
| Specific Gravity | 1.329-1.343 at 15°C |

Weak nitric acid is packed and supplied in stainless steel tankers.

**RCF Weak Nitric Acid Market, Installed Capacity, By Volume (Thousand Metric Tons) (FY2015-FY2030)**

*References: TechSci Analysis, Secondary Sources, Primary Interviews*

RCF has an annual installed capacity 396 thousand metric tons for weak nitric acid.

**RCF Weak Nitric Acid Market, Production, By Volume (Thousand Metric Tons) (FY2015-FY2030)**

*References: TechSci Analysis, Secondary Sources, Primary Interviews*

RCF’s weak nitric acid production was 376 thousand metric tons in FY2015. The production dipped to 368 thousand metric tons in FY2021. The production is expected to reach up to 392 thousand metric tons by FY2030.

**RCF Weak Nitric Acid Market, Operating Efficiency (%) (FY2015-FY2030)**

*References: TechSci Analysis, Secondary Sources, Primary Interviews*

In FY2015, RCF was operating at an efficiency of 95% which dips to 93% in FY2021. The company recorded its highest operating efficiency of 97% in FY2019. In the forecast period the company is expected to achieve up to 99% operating efficiency.

**Key Developments & Planned Expansions:**

* RCF, Trombay at present is producing AN-melt at 149,000 MT per annum using Ammonia and dilute Nitric acid in Calcium Ammonium Nitrate (CAN) section of existing Ammonium Nitro Phosphate (ANP) plant after in-house modification of AN Melt section of ANP plant. RCF plans to safely produce up to 540 MTPD AN Melt from existing plant. So, the enhanced production is possible without any modification / addition in the existing plant. As per this revamping activity the company is planning to reach 100% capacity utilization for ammonium nitrate.

Logo, company name

Description automatically generated**4.4 National Fertilizers Limited (NFL)**

**Head Office Location:** Uttar Pradesh, India

**Business Overview:** National Fertilizers Limited was established in 1974 and has headquarters in Noida, Uttar Pradesh. Under the ownership of Ministry of Chemicals and Fertilizers, it manufactures chemical & organic fertilizers, and industrial chemicals.

The company has four manufacturing plants at Nangal, Panipat, Bhatinda, and Vijaipur. It also has R&D facility set-up at each manufacturing unit.

NFL has a marketing network of central office at Noida, four zonal offices at Bhopal, Lucknow, Chandigarh, Hyderabad, 15 state and 13 union territory offices.

As of FY 2020-2021, NFL generated a revenue of INR 11,906 Crores.

**Product Segments:** National Fertilizers Limited is engaged in manufacturing and marketing of four major product segment namely, Neem Coated Urea, four strains of Bio-Fertilizers (solid & liquid), Bentonite Sulphur and other allied Industrial products such as Ammonia, Nitric Acid, Ammonium Nitrate, Sodium Nitrite and Sodium Nitrate. The company operates under the brand name “KISAN”.

NFL is also expanding in the trading business of products such as Non-Urea Fertilizers, Certified Seeds, Agrochemicals, Bentonite Sulphur, City Compost through its existing PAN India dealer’s network under single window concept.

**Manufacturing and Plant Details:**

**Ammonium Nitrate**

|  |  |
| --- | --- |
| Location | Installed Capacity (Thousand Metric Tons Per Annum)-FY2021 |
| Nangal, Punjab | 186 |

**Weak Nitric Acid**

|  |  |
| --- | --- |
| Location | Installed Capacity (Thousand Metric Tons Per Annum) -FY2021 |
| Nangal, Punjab | 182 |

*References: TechSci Analysis, Secondary Sources, Primary Interviews*

**Revenue and Other Key Financial Details:**

|  |  |  |
| --- | --- | --- |
| Particulars | FY2020-2021 | FY2019-2020 |
| **Revenue** | **11,906** | **13,135** |
| **Profit Before Tax** | **343** | **-253** |
| **% Margin** | **3%** | **-2%** |
| **Profit After Tax** | **250** | **-171** |
| **% Margin** | **2%** | **-1%** |

*References: Annual Report*

*References: Annual Report*

**Ammonium Nitrate:**

|  |  |  |
| --- | --- | --- |
| Particulars | FY2020-2021 | FY2019-2020 |
| Production (Thousand Metric Tons Per Annum) | 11 | 8 |
| Market Share – By Production (%) | 2% | 1% |
| Market Share – By Volume (Domestic Consumption) (%) | 0.92% | 0.89% |

**Weak Nitric Acid:**

|  |  |  |
| --- | --- | --- |
| Particulars | FY2020-2021 | FY2019-2020 |
| Production (Thousand Metric Tons Per Annum) | 84 | 86 |
| Market Share – By Production (%) | 6% | 6% |
| Market Share – By Volume (Domestic Consumption) (%) | 27% | 26% |

*References: TechSci Analysis, Secondary Sources, Primary Interviews*

**Ammonium Nitrate:**

National Fertilizers Limited manufactures ammonium nitrate in melted form also called AN melt. The ammonium nitrate melt is mainly used in explosives applications.

Ammonium nitrate is manufactured at NFL’s Nangal plant having a manufacturing capacity of 706 MT/day for two streams.

The product is supplied in insulated stainless steel containers.

Specification of NFL’s AN melt product:

|  |  |
| --- | --- |
| Concentration as Ammonium Nitrate Melt | 82-84% by wt. min  Balance Water |

It is used for applications such as Explosives, Pyrotechnics, Herbicides & Insecticides, Nitrous Oxide, Absorbent for Nitrogen, Oxides, Ingredient for freezing mixtures, Oxidizer in solid rocket properties, Nutrient for Antibiotics & yeast, and Catalyst.

**NFL Ammonium Nitrate Market, Installed Capacity, By Volume (Thousand Metric Tons) (FY2015-FY2030)**

*References: TechSci Analysis, Secondary Sources, Primary Interviews*

NFL has an installed capacity of 186 thousand metric tons per annum.

**NFL Ammonium Nitrate Market, Production, By Volume (Thousand Metric Tons) (FY2015-FY2030)**

*References: TechSci Analysis, Secondary Sources, Primary Interviews*

NFL’s production of ammonium nitrate grew from 9 thousand metric tons in FY2015 to 11 thousand metric tons in FY2021. The production is expected to reach up to 15 thousand metric tons by FY2030.

**NFL Ammonium Nitrate Market, Operating Efficiency (%) (FY2015-FY2030)**

*References: TechSci Analysis, Secondary Sources, Primary Interviews*

In FY2015, NFL was operating at an efficiency of 5% which reaches up to 6% in FY2021. In the forecast period the company is expected to achieve up to 8% operating efficiency.

The company has low operating efficiency because of unavailability of storage licensing for ammonium nitrate and halt in calcium ammonium nitrate production. By FY2014, NFL used to manufacture AN melt as an intermediatory product in the calcium ammonium nitrate manufacturing plant, the production of calcium ammonium nitrate has now been halted at NFL.

**Weak Nitric Acid:**

NFL manufactures weak nitric acid of two grades, which are 54% WNA, and 60% WNA.

Weak nitric acid manufactured by NFL is majorly used for manufacturing products such as Organic Synthesis, Photo engraving, Medicine, Preparation of Nitro Compounds, Oxidizer in liquid rocket propellants, and Refining of Silver.

NFL has a production capacity of 560 MT/day for both the streams. It is manufactured at the company’s Nangal plant.

The product is supplied in stainless steel road tankers.

**NFL Weak Nitric Acid Market, Installed Capacity, By Volume (Thousand Metric Tons) (FY2015-FY2030)**

*References: TechSci Analysis, Secondary Sources, Primary Interviews*

NFL has annual installed capacity of 182 thousand metric tons for weak nitric acid.

**NFL Weak Nitric Acid Market, Production, By Volume (Thousand Metric Tons) (FY2015-FY2030)**

*References: TechSci Analysis, Secondary Sources, Primary Interviews*

NFL’s production was approximately 89 thousand metric tons in FY2015 and dipped to 84 thousand metric tons in FY2021. The production is expected to reach up to 100 thousand metric tons by FY2030.

**NFL Weak Nitric Acid Market, Operating Efficiency (%) (FY2015-FY2030)**

*References: TechSci Analysis, Secondary Sources, Primary Interviews*

In FY2015, NFL was operating at an efficiency of 49% which dipped to 46% in FY2021. The company recorded its highest operating efficiency of 53% in FY2019. In the forecast period the company is expected to achieve up to 55% operating efficiency.

**Key Developments & Planned Expansions:**

* The company plans to increase in capacity utilization of Nitric Acid & Ammonium Nitrate Plants at Nangal.
* NFL also plans to maximize production of Industrial Products including Ammonium Nitrate.

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Description automatically generated

**ANNEXURE**

**East India Ammonium Nitrate Explosives Applications Market, By Volume (Thousand Metric Tons)**

|  |  |
| --- | --- |
| **CAGR FY2015-FY2021** | **CAGR FY2022-FY2030** |
| 7.4% | 8.6% |

*References: TechSci Analysis, Secondary Sources, Primary Interviews*

**East India Ammonium Nitrate Mining Applications Market, By Volume (Thousand Metric Tons)**

|  |  |
| --- | --- |
| **CAGR FY2015-FY2021** | **CAGR FY2022-FY2030** |
| 6.6% | 8.1% |

*References: TechSci Analysis, Secondary Sources, Primary Interviews*

**East India Ammonium Nitrate Commercial & Infrastructure Applications Market, By Volume (Thousand Metric Tons)**

|  |  |
| --- | --- |
| **CAGR FY2015-FY2021** | **CAGR FY2022-FY2030** |
| 8.2% | 9.3% |

**East India Ammonium Nitrate Pharmaceuticals Applications Market, By Volume (Thousand Metric Tons)**

|  |  |
| --- | --- |
| **CAGR FY2015-FY2021** | **CAGR FY2022-FY2030** |
| 8.4% | 9.8% |

*References: TechSci Analysis, Secondary Sources, Primary Interviews*

**East India Ammonium Nitrate Other Applications Market, By Volume (Thousand Metric Tons)**

|  |  |
| --- | --- |
| **CAGR FY2015-FY2021** | **CAGR FY2022-FY2030** |
| 8.9% | 9.2% |

*References: TechSci Analysis, Secondary Sources, Primary Interviews*

**West India Ammonium Nitrate Explosives Applications Market, By Volume (Thousand Metric Tons)**

|  |  |
| --- | --- |
| **CAGR FY2015-FY2021** | **CAGR FY2022-FY2030** |
| 7.1% | 8.3% |

*References: TechSci Analysis, Secondary Sources, Primary Interviews*

**West India Ammonium Nitrate Mining Applications Market, By Volume (Thousand Metric Tons)**

|  |  |
| --- | --- |
| **CAGR FY2015-FY2021** | **CAGR FY2022-FY2030** |
| 7.5% | 8.5% |

*References: TechSci Analysis, Secondary Sources, Primary Interviews*

**West India Ammonium Nitrate Commercial & Infrastructure Applications Market, By Volume (Thousand Metric Tons)**

|  |  |
| --- | --- |
| **CAGR FY2015-FY2021** | **CAGR FY2022-FY2030** |
| 7.6% | 8.6% |

*References: TechSci Analysis, Secondary Sources, Primary Interviews*

**West India Ammonium Nitrate Pharmaceuticals Applications Market, By Volume (Thousand Metric Tons)**

|  |  |
| --- | --- |
| **CAGR FY2015-FY2021** | **CAGR FY2022-FY2030** |
| 6.3% | 7.3% |

*References: TechSci Analysis, Secondary Sources, Primary Interviews*

**West India Ammonium Nitrate Other Applications Market, By Volume (Thousand Metric Tons)**

|  |  |
| --- | --- |
| **CAGR FY2015-FY2021** | **CAGR FY2022-FY2030** |
| 5.0% | 5.5% |

*References: TechSci Analysis, Secondary Sources, Primary Interviews*

**South India Ammonium Nitrate Explosives Applications Market, By Volume (Thousand Metric Tons)**

|  |  |
| --- | --- |
| **CAGR FY2015-FY2021** | **CAGR FY2022-FY2030** |
| 5.6% | 7.2% |

*References: TechSci Analysis, Secondary Sources, Primary Interviews*

**South India Ammonium Nitrate Mining Applications Market, By Volume (Thousand Metric Tons)**

|  |  |
| --- | --- |
| **CAGR FY2015-FY2021** | **CAGR FY2022-FY2030** |
| 5.3% | 7.5% |

*References: TechSci Analysis, Secondary Sources, Primary Interviews*

**South India Ammonium Nitrate Commercial & Infrastructure Applications Market, By Volume (Thousand Metric Tons)**

|  |  |
| --- | --- |
| **CAGR FY2015-FY2021** | **CAGR FY2022-FY2030** |
| 6.2% | 7.6% |

*References: TechSci Analysis, Secondary Sources, Primary Interviews*

**South India Ammonium Nitrate Pharmaceuticals Applications Market, By Volume (Thousand Metric Tons)**

|  |  |
| --- | --- |
| **CAGR FY2015-FY2021** | **CAGR FY2022-FY2030** |
| 6.3% | 7.8% |

*References: TechSci Analysis, Secondary Sources, Primary Interviews*

**South India Ammonium Nitrate Other Applications Market, By Volume (Thousand Metric Tons)**

|  |  |
| --- | --- |
| **CAGR FY2015-FY2021** | **CAGR FY2022-FY2030** |
| 6.4% | 6.7% |

*References: TechSci Analysis, Secondary Sources, Primary Interviews*

**North India Ammonium Nitrate Explosives Applications Market, By Volume (Thousand Metric Tons)**

|  |  |
| --- | --- |
| **CAGR FY2015-FY2021** | **CAGR FY2022-FY2030** |
| 3.0% | 4.0% |

*References: TechSci Analysis, Secondary Sources, Primary Interviews*

**North India Ammonium Nitrate Mining Applications Market, By Volume (Thousand Metric Tons)**

|  |  |
| --- | --- |
| **CAGR FY2015-FY2021** | **CAGR FY2022-FY2030** |
| 3.4% | 4.2% |

*References: TechSci Analysis, Secondary Sources, Primary Interviews*

**North India Ammonium Nitrate Commercial & Infrastructure Applications Market, By Volume (Thousand Metric Tons)**

|  |  |
| --- | --- |
| **CAGR FY2015-FY2021** | **CAGR FY2022-FY2030** |
| 3.6% | 4.4% |

*References: TechSci Analysis, Secondary Sources, Primary Interviews*

**North India Ammonium Nitrate Pharmaceuticals Applications Market, By Volume (Thousand Metric Tons)**

|  |  |
| --- | --- |
| **CAGR FY2015-FY2021** | **CAGR FY2022-FY2030** |
| 3.4% | 4.5% |

*References: TechSci Analysis, Secondary Sources, Primary Interviews*

**North India Ammonium Nitrate Other Applications Market, By Volume (Thousand Metric Tons)-**

|  |  |
| --- | --- |
| **CAGR FY2015-FY2021** | **CAGR FY2022-FY2030** |
| 2.5% | 3.0% |

*References: TechSci Analysis, Secondary Sources, Primary Interviews*

**West India Weak Nitric Acid Market, By Sales, By Volume (Thousand Metric Tons)**

|  |  |  |
| --- | --- | --- |
| **By Sales** | **CAGR FY2015-FY2021** | **CAGR FY2022-FY2030** |
| Captive | 2.8% | 5.8% |
| Merchant | 1.7% | 4.5% |

*References: TechSci Analysis, Secondary Sources, Primary Interviews*

**West India Weak Nitric Acid Ammonium Nitrate Applications Market, By Volume (Thousand Metric Tons)**

|  |  |
| --- | --- |
| **CAGR FY2015-FY2021** | **CAGR FY2022-FY2030** |
| 5.2% | 5.1% |

*References: TechSci Analysis, Secondary Sources, Primary Interviews*

**West India Weak Nitric Acid Fertilizers Applications Market, By Volume (Thousand Metric Tons)**

|  |  |
| --- | --- |
| **CAGR FY2015-FY2021** | **CAGR FY2022-FY2030** |
| 1.0% | 5.4% |

*References: TechSci Analysis, Secondary Sources, Primary Interviews*

**West India Weak Nitric Acid Concentrate Nitric Acid Applications Market, By Volume (Thousand Metric Tons)**

|  |  |
| --- | --- |
| **CAGR FY2015-FY2021** | **CAGR FY2022-FY2030** |
| 1.4% | 7.6% |

*References: TechSci Analysis, Secondary Sources, Primary Interviews*

**West India Weak Nitric Acid Strong Nitric Acid Applications Market, By Volume (Thousand Metric Tons)**

|  |  |
| --- | --- |
| **CAGR FY2015-FY2021** | **CAGR FY2022-FY2030** |
| 1.3% | 7.8% |

*References: TechSci Analysis, Secondary Sources, Primary Interviews*

**South India Weak Nitric Acid Market, By Sales, By Volume (Thousand Metric Tons)**

|  |  |  |
| --- | --- | --- |
| **By Sales** | **CAGR FY2015-FY2021** | **CAGR FY2022-FY2030** |
| Captive | 2.7% | 5.4% |
| Merchant | 1.6% | 3.0% |

*References: TechSci Analysis, Secondary Sources, Primary Interviews*

**South India Weak Nitric Acid Ammonium Nitrate Applications Market, By Volume (Thousand Metric Tons)**

|  |  |
| --- | --- |
| **CAGR FY2015-FY2021** | **CAGR FY2022-FY2030** |
| 4.7% | 4.2% |

*References: TechSci Analysis, Secondary Sources, Primary Interviews*

**South India Weak Nitric Acid Fertilizers Applications Market, By Volume (Thousand Metric Tons)**

|  |  |
| --- | --- |
| **CAGR FY2015-FY2021** | **CAGR FY2022-FY2030** |
| 1.6% | 5.6% |

*References: TechSci Analysis, Secondary Sources, Primary Interviews*

**South India Weak Nitric Acid Concentrate Nitric Acid Applications Market, By Volume (Thousand Metric Tons)**

|  |  |
| --- | --- |
| **CAGR FY2015-FY2021** | **CAGR FY2022-FY2030** |
| 1.0% | 7.2% |

*References: TechSci Analysis, Secondary Sources, Primary Interviews*

**South India Weak Nitric Acid Strong Nitric Acid Applications Market, By Volume (Thousand Metric Tons)**

|  |  |
| --- | --- |
| **CAGR FY2015-FY2021** | **CAGR FY2022-FY2030** |
| 1.2% | 6.2% |

*References: TechSci Analysis, Secondary Sources, Primary Interviews*

**East India Weak Nitric Acid Market, By Sales, By Volume (Thousand Metric Tons)**

|  |  |  |
| --- | --- | --- |
| **By Sales** | **CAGR FY2015-FY2021** | **CAGR FY2022-FY2030** |
| Captive | 1.7% | 4.4% |
| Merchant | 1.6% | 2.4% |

*References: TechSci Analysis, Secondary Sources, Primary Interviews*

**East India Weak Nitric Acid Ammonium Nitrate Applications Market, By Volume (Thousand Metric Tons)**

|  |  |
| --- | --- |
| **CAGR FY2015-FY2021** | **CAGR FY2022-FY2030** |
| 3.7% | 3.9% |

*References: TechSci Analysis, Secondary Sources, Primary Interviews*

**East India Weak Nitric Acid Fertilizers Applications Market, By Volume (Thousand Metric Tons)**

|  |  |
| --- | --- |
| **CAGR FY2015-FY2021** | **CAGR FY2022-FY2030** |
| 0.2% | 3.9% |

*References: TechSci Analysis, Secondary Sources, Primary Interviews*

**East India Weak Nitric Acid Concentrate Nitric Acid Applications Market, By Volume (Thousand Metric Tons)**

|  |  |
| --- | --- |
| **CAGR FY2015-FY2021** | **CAGR FY2022-FY2030** |
| 0.3% | 6.3% |

*References: TechSci Analysis, Secondary Sources, Primary Interviews*

**East India Weak Nitric Acid Strong Nitric Acid Applications Market, By Volume (Thousand Metric Tons)**

|  |  |
| --- | --- |
| **CAGR FY2015-FY2021** | **CAGR FY2022-FY2030** |
| 1.2% | 5.6% |

*References: TechSci Analysis, Secondary Sources, Primary Interviews*

**North India Weak Nitric Acid Market, By Sales, By Volume (Thousand Metric Tons)**

|  |  |  |
| --- | --- | --- |
| **By Sales** | **CAGR FY2015-FY2021** | **CAGR FY2022-FY2030** |
| Captive | 1.8% | 3.1% |
| Merchant | 1.5% | 2.4% |

*References: TechSci Analysis, Secondary Sources, Primary Interviews*

**North India Weak Nitric Acid Ammonium Nitrate Applications Market, By Volume (Thousand Metric Tons)**

|  |  |
| --- | --- |
| **CAGR FY2015-FY2021** | **CAGR FY2022-FY2030** |
| 4.1% | 2.4% |

*References: TechSci Analysis, Secondary Sources, Primary Interviews*

**North India Weak Nitric Acid Fertilizers Applications Market, By Volume (Thousand Metric Tons)**

|  |  |
| --- | --- |
| **CAGR FY2015-FY2021** | **CAGR FY2022-FY2030** |
| 0.2% | 2.8% |

*References: TechSci Analysis, Secondary Sources, Primary Interviews*

**North India Weak Nitric Acid CNA Applications Market, By Volume (Thousand Metric Tons)**

|  |  |
| --- | --- |
| **CAGR FY2015-FY2021** | **CAGR FY2022-FY2030** |
| 0.1% | 4.7% |

*References: TechSci Analysis, Secondary Sources, Primary Interviews*

**North India Weak Nitric Acid Strong Nitric Acid Applications Market, By Volume (Thousand Metric Tons)**

|  |  |
| --- | --- |
| **CAGR FY2015-FY2021** | **CAGR FY2022-FY2030** |
| 1.2% | 6.0% |

*References: TechSci Analysis, Secondary Sources, Primary Interviews*

**ANFO Manufacturing:**

ANFO explosives are a mixture of ammonium nitrate and fuel oil. These are primarily used as blasting agents in industry and mining. ANFO explosives consists of 94% ammonium nitrate and 6% fuel oil by composition. They have a bulk density between 0.8 and 0.9 kg / L.

The ammonium nitrate particles used for ANFO are porous and spherical. The porosity of ammonium nitrate is one of the most important parameters while manufacturing explosives. Porosity is associated with the effectiveness of the material as an adsorbent, which is particularly important in the case of AN/mineral oil mixtures (ANFO).

AN provides a greater number of initiation points with high sensitivity to detonation, also called hot spots owing to its air cavities enclosed in the micropore structure of the particles. These initiation points are adiabatically compressed as a result of mechanical action and transfer the initiation energy through the load. The fuel oil is then absorbed by the ammonium nitrate particles to produce a free-flowing particulate mixture which can be detonated.

Despite its low detonation pressure and detonation velocity, ANFO is characterized by a significant destructive power due to the large volume of detonation gases. ANFO is most widely used explosives in the mining industry over other emulsion explosives in the market because of its uncomplicated manufacturing technology, small number of its components, and low production costs compared to EEs.

Ammonium nitrate is used as a component of many explosives, such as ANNM, amatols, and ammonals. However, ANFO explosives are relatively safe while maintaining the properties similar to other emulsion explosives.

**Comparison of Detonation Composition and Detonation Velocity in Commonly Used, Industrially Prepared Ammonium-Nitrate-Based Explosives**

|  |  |  |  |
| --- | --- | --- | --- |
| **Parameter** | **Explosive** | | |
| **ANFO** | **ANNMAL** | **Amatol** |
| Composition (wt%) | AN-94 | AN-66 | AN-50 |
| FO-6 | NM (nitromethane)-25 | TNT-50 |
|  | Al-5 |  |
|  | C-3 |  |
|  | TETA (triethylenetetramine)-1 |  |
| Density (kg/m3) | 917.86 | 1158.13 | 1496.12 |
| Typical detonation velocity (km/s) | 5269.93 | 5359.94 | 6289.91 |

*References: Secondary Sources*

**Comparison of Energetic Properties of Typical ANFO and EE Formulations**

|  |  |  |
| --- | --- | --- |
| **Parameter** | **ANFO** | **EE** |
| Critical diameter (mm) | 50–80 | 16–46 |
| Loading density (g∙cm−3): | 0.75–0.85 | 0.90–1.20 |
| Detonation model: | Non-ideal | Ideal (provided it contains no stable components) |
| Detonation velocity (m∙s−1): | 1800–3300 | 3800–5100 |
| Water-resistance | No | Yes |
| Components | Ammonium nitrate (>90 wt%), FO (1–10) wt% | Oxidising agents, organic fuels, inorganic fuels, water, emulsifying agents, sensitizing agents, modifying agents |
|
| Manufacturing technology | Uncomplicated | Complicated |
| Price | Low | High |
| Trauzl lead block test (cm3/10 gPb) | 211.83 | 360 |
| Ballistic mortar test (%) | 51.09 | 80.4–84.4 |

*References: Secondary Sources*

**Ammonium Nitrate Rules, 2012**

The Ammonium Nitrate Rules, 2012 was established by Government of India in the Ministry of Commerce and Industry (Department of Industrial Policy and Promotion) under the Explosive Act, 1884.

The definition of Ammonium Nitrate as per the rule is mentioned below:

"Ammonium Nitrate" means the compound having the chemical formula NH4NO3 and includes any mixture or compound having more than 45 percent Ammonium Nitrate by weight including emulsions, suspensions, melts or gels (with or without inorganic nitrates) but excluding emulsion or slurry explosives and non-explosives emulsion matrix and fertilizers from which the Ammonium Nitrate cannot be extracted by any physical or chemical process.

**Scope of Applicability of Rules and Exemptions**:

1. These rules are applicable all over India for regulating the manufacturing, conversion, import, export, stevedoring, bagging, transport, and possession for sale or use of the Ammonium Nitrate.
2. Nothing in these rules shall apply to the possession, use, transport or import or export of Ammonium Nitrate by –
   1. any of the, Armed Forces of the Union and Ordnance Factories or other establishments of such Forces for own use in accordance with the rules or regulations made by the Central Government;
   2. the Indian Railways and its authorized carriers while acting as carrier;
   3. the Port authority;
   4. any person employed under the Central Government or State Government in exercise of any power under the Act or these rules.
3. Nothing in these rules shall apply to the possession and use of ammonium nitrate of quantity not exceeding five kilograms by the established laboratories, educational institutions, medical institutions, hospitals and health clinics for scientific and educational purpose: Provided the local police is informed of the quantity under possession for the aforesaid purpose

**Control over manufacture, conversion, stevedoring and bagging, import, export, transport, possession for sale or use of Ammonium Nitrate**: No person shall undertake manufacture, conversion, stevedoring, import, export, transport or possess for sale or use Ammonium Nitrate except as authorized or licensed under these rules.

**Pre-requisite for grant of license:** No license shall be granted unless all the relevant provisions laid down under these rules and all conditions contained in the license forms under Part-2 of Schedule II annexed to these rules are complied with:

Provided that all the existing manufacturers, converters, users, transporters, stevedores, sellers, possessors, importers and exporters shall apply for license within six months and shall comply with the provisions of these rules within a period of one year from the date of publication of these rules.

**General Restrictions:**

1. **Restriction on manufacture** - The Ammonium Nitrate shall not be manufactured at any place other than the place indicated in the licence.
2. **Restriction on storage and conversion;** -
   1. The Ammonium Nitrate storehouse shall not be located in populated areas.
   2. No Ammonium Nitrate shall be converted at any place except at converter's premises duly licensed.
   3. No person shall extract Ammonium Nitrate from any fertilizer including by any chemical or physical process.
3. **Restriction on stevedoring, bagging and possession for sale or use**:
4. No person shall undertake stevedoring, bagging and possession for sale or use Ammonium Nitrate except under conditions of a licence granted under these rules at a licensed store house as specified therein;
5. No person shall store, process, deliver, receive, handle or transport any Ammonium Nitrate contaminated fully or partially with any organic material, metal powder or scraps, or sulphur, phosphorous etc.
6. **Restriction on import or export:**
   1. No person shall import or export any Ammonium Nitrate except under and in accordance with the conditions of licence granted under these rules;
   2. No Ammonium Nitrate shall be imported or exported except at its ports notified by the Central Government.
   3. The Ammonium Nitrate shall not be imported into India by Sea except through the ports which are duly approved for this purpose by the Ministry of Shipping and Transport, Government of India, in consultation with the Chief Controller and declared as Customs Ports by the Commissioner of Customs.
   4. The Ammonium Nitrate imported into India by sea shall not be stored in the port.
7. **Restriction on transport**:
8. The Ammonium Nitrate shall not be transported with any other explosives, inflammable substances, oil, gases, carbonaceous matter, etc.
9. No Ammonium Nitrate shall be transported in any carriage vessel plying for or carrying passengers on hire.
10. **Restriction on delivery or dispatch:**
11. No person shall deliver or dispatch any Ammonium Nitrate to anyone other than a person who-
    1. is the holder of a licence to possess the Ammonium Nitrate or the agent of a holder of such a licence duly authorised by him in writing on his behalf; or
    2. is entitled under these rules to possess the Ammonium Nitrate without a licence.
12. The Ammonium Nitrate so delivered or dispatched shall in no case exceed the quantity at any point of time for which the person is holding a licence under these rules.
13. No person shall receive Ammonium Nitrate from any person other than the holder of a licence granted under these rules.
14. **Restriction on handling Ammonium Nitrate:**

No person shall handle or cause to be handled any ammonium Nitrate between the hours of sunset and sunrise: Provided that nothing in this rule shall apply to handling of Ammonium Nitrate during the dark hours if proper illumination is provided in the area and the place is guarded.

1. **Restriction on employment of children, intoxicated persons and certain other persons:**

No person shall employ, allow or engage a person

1. who is below the age of eighteen years; or
2. who is in a state of intoxication; or
3. who is mentally or physically challenged,

for manufacture, conversion, bagging, storage, sale, loading, unloading or transport of Ammonium Nitrate or to enter any premises permitted under these rules.

1. **Restriction on toxic, corrosive, dangerous or flammable substances**:

No toxic, corrosive or flammable or otherwise dangerous substances such as carbonaceous matter, reducing agents, petroleum, carbide of calcium, compressed gases or any other chemical which may react with Ammonium Nitrate in a manner that may result in an explosion shall be allowed in the premises meant for manufacture, conversion, bagging, storage, import, export, transport or handling of Ammonium Nitrate.

1. **Restriction on use:**

Ammonium Nitrate shall not be used for blasting either alone or in combination with other ingredients unless permitted under the Explosives Rules, 2008.

**Packing of Ammonium Nitrate:**

No person shall import, export, transport, possess or sell Ammonium Nitrate unless;

1. it is duly packed in a suitable waterproof bag or container or is suitably bagged by stevedore or converter;
2. the container or package is marked in accordance with the provisions of rule 8;
3. the packages conform to the relevant standard of Bureau of Indian Standards or other standards accepted and approved by the Chief Controller; and
4. the packages of Ammonium Nitrate for export or import conform to the requirements of the tests as specified under International Maritime Dangerous Goods Code (hereinafter referred to as the IMDG Code in these rules) or United Nations recommendations on the transport of Dangerous Goods.

**Marking on Ammonium Nitrate packages:**

Each bag or container containing Ammonium Nitrate shall be marked in conspicuous indelible characters, by means of stamping or painting with-

1. the words "Ammonium Nitrate";
2. purity in percentage;
3. the name, address and licence number of manufacturer or converter or importer;
4. identification number of the package or bar coding;
5. the net weight of Ammonium Nitrate;
6. gross weight of the package;
7. date of bagging and batch number;
8. name, address, licence number and unique identification number of stevedoring agent, if any.

The bags shall be serially numbered with date of bagging by means of stencilling, bar-coding, by RFID tags or any other means by the manufacturer or importer as directed by the Chief Controller.

**Import or export by land:**

No licence for import or export of Ammonium Nitrate by land shall be granted without the previous sanction of the Central Government in each case, wherein the Central Government may impose conditions and restrictions in consultation with the Chief Controller

**Compliance of Port Rules:**

The provision of rules regulating handling of Ammonium Nitrate at the notified ports issued under the Act and respective Port rules and bye-laws shall be observed.

**Import of Ammonium Nitrate:**

1. Ammonium Nitrate shall preferably be imported in the bagged form and whenever Ammonium Nitrate is imported in bulk, it shall be bagged or packed suitably by stevedoring agency duly authorized in writing by importer and having valid licence under these rules.
2. The stevedoring agent shall maintain records of Ammonium Nitrate received and dispatched to each importer to ensure accountability, identification and traceability and file returns.
3. The imported Ammonium Nitrate shall be immediately removed from the port to the stevedores licensed storehouse. Ammonium Nitrate shall be dispatched from the stevedore's storehouse only in bagged form and each bag of Ammonium Nitrate shall be marked by stevedoring agent in accordance with rule 9.
4. Declaration by importer - A person holding an import licence granted under these rules shall furnish a declaration to the licensing Authority and the Chief Controller;
5. in Form R-3 under Part of Schedule II as soon as ship carrying Ammonium Nitrate sails from the port of loading;
6. in Form R-4 under Part 3 of Schedule II as soon as any shipment of Ammonium Nitrate is cleared at the port of import.
7. Declaration by master of ship or by the ship's agent-
8. the master or every ship carrying Ammonium Nitrate or the agent for such ship shall give the Conservator of the port not less than forty eight hours' notice of its intended arrival at the port;
9. the master of every ship carrying Ammonium Nitrate shall deliver to the pilot before entering any port, a written declaration in Form CE-1, under Part 4 of Schedule II, provided that if in anticipation of a ship's arrival, the agent for such ship delivers to the Conservator of the port a written declaration, as aforesaid under his signature, no such declaration need to be made by master of the ship;
10. Every declaration delivered to a pilot under clause (b) of sub-rule (5) shall be made over by him without delay to the Conservator of the port and all declarations received by the Conservator of the port shall be forwarded by him, with all convenient despatch to the Commissioner of Customs.
11. Restrictions on import by air: The Ammonium Nitrate shall not be imported by air.

**Export of Ammonium Nitrate:**

1. **Restrictions on export by air** - The Ammonium Nitrate shall not be exported by air.
2. **Declaration by exporter or his agent** - The exporter or his authorised agent shall give notice to the conservator of the port before forty-eight hours that he intends to bring the Ammonium Nitrate to port for export and shall not bring the Ammonium Nitrate to any part of the port without prior permission in writing from the said officer.
3. Export of Ammonium Nitrate shall only be in the bagged form and marked in accordance with the provisions of rule 9.

**Possession in licensed premises:**

1. A person holding licence for possession of Ammonium Nitrate granted under these rules shall store the Ammonium Nitrate only in the premises specified in the licence.
2. The premises in which Ammonium Nitrate is kept shall be used only for possession and sale or use of such Ammonium Nitrate and for no other purposes.
3. No person shall sell Ammonium Nitrate from any premises other than those licensed under these rules.
4. The Licensed storehouse shall be kept securely closed or locked except when Ammonium Nitrate is taken in or taken out.
5. The keys of the Licensed storehouse shall be kept in the licence holder's custody or with his authorised agent and shall be produced for opening the storehouse whenever so required by the inspecting officer.
6. The name, address and passport size photograph of the authorized agent with whom the keys will be kept shall be furnished to the licensing authority and the District authority having jurisdiction.

**Quantity of Ammonium Nitrate to be purchased in a given period of time:**

A licence holder for possession, sale or use of Ammonium Nitrate in and from a storehouse shall purchase only such quantity of Ammonium Nitrate in a given period as may be specified in the licence.

**Disclaimer**

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