

FUTURE REQUIREMENT OF FEEDSTOCK, INTERMEDIATES AND RAW MATERIALS

Dr. S. Nand

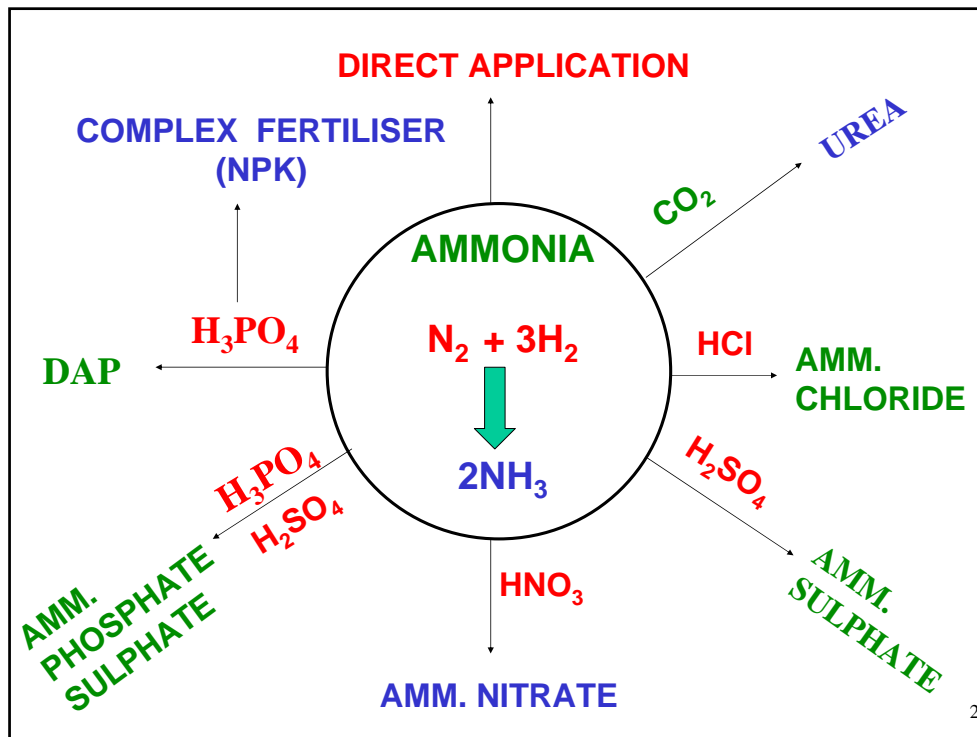
Additional Director (Technical)



Fertiliser Association of India

New Delhi

1



Feedstocks/Raw Materials

I. Nitrogenous Fertilizers

- **Natural/Associated Gas**
- **Naphtha**
- **Fuel Oil**
- **Coal**
- **Coke Oven Gas**
- **Water (electrolysis)**

3

I. NITROGENOUS FERTILISERS

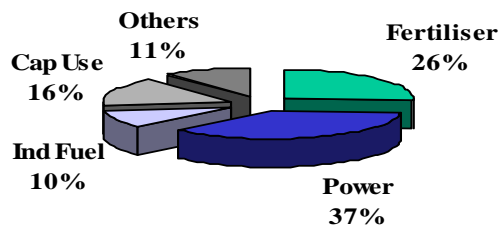
Overview of Indian Fertiliser Industry (2004-05)

Fertiliser	Capacity (million tonnes)	No. of Plants
1. Ammonia	13.5	36
2. Urea	20.8	34
3. DAP	7.1	11
4. NP/NPK (Other than DAP)	3.4	19

5

Pattern of Gas Use

ALL INDIA DURING 2003-04



Basic Statistics on Indian Petroleum & Natural Gas (2003-04)

6

Consumption of Different Feedstocks in Fertiliser Sector (2004-05)

Gas	8.17 billion cubic meter (billion M³)
Naphtha	3.17 million tonnes
Fuel Oil & LSHS	1.86 million tonnes

World Ammonia Feedstock

Feedstock	Percent of Total
Natural Gas	83
Coal (Excl small & medium cap in China)	2
Fuel Oil	6
Naphtha	5
Hydrogen	1
Condensates	1
Coke Oven Gas	<1
Refinery Off gas	<1
LNG	<1
Electrolysis & All Other	<1

8

Feedstock / Source of Indian Ammonia Capacity (as on November 2005)

Feedstock	Percent of Total
Natural Gas	51.2
Naphtha	26.0
Fuel Oil	8.6
Coke Oven Gas	0.5
External Ammonia	13.7

9

Source of Indian Ammonia

Projected 'N' for 2005-06	13.41million MT
"N" from Domestic Ammonia Capacity	11.12 million MT
"N" from external source as Amm, DAP and Urea	2.29 million Mt (17%)

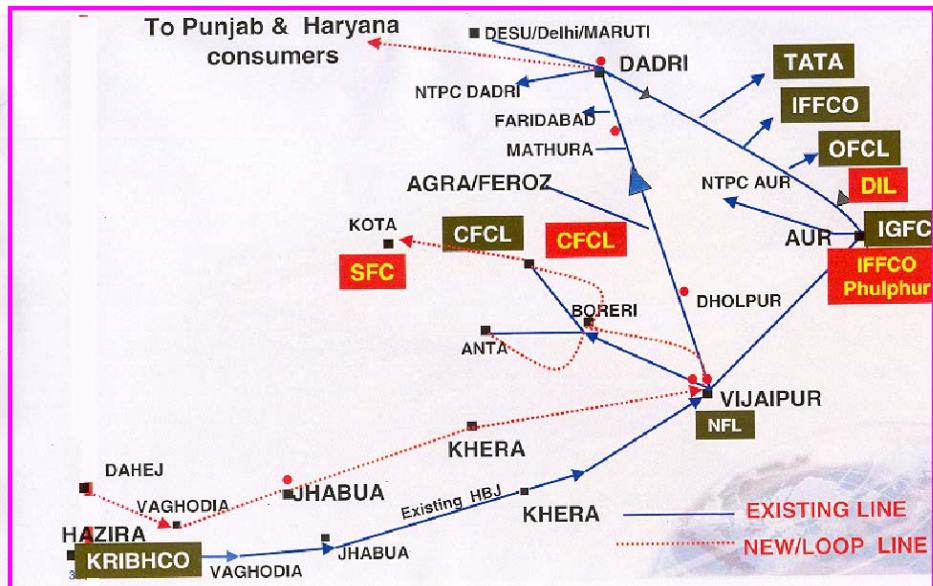
10

PRESENT NATURAL GAS (NG) SCENARIO FOR INDIA

- N G from Domestic sources 66 MMSCMD
- Re Gasified LNG 18 MMSCMD
- Total 84 MMSCMD

- Supply to Fertiliser units 31 MMSCMD

Present Gas Pipeline Network



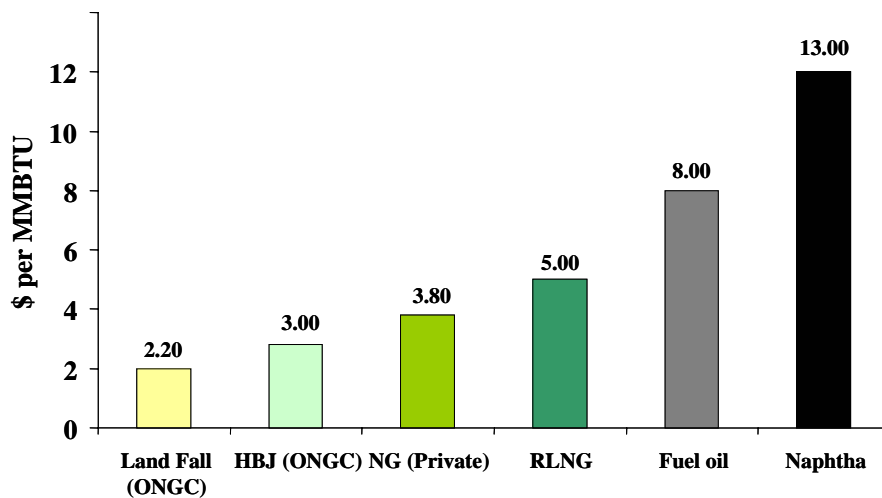
Delivered Prices of Various Feedstocks (for Fertiliser) in India* (\$ per million BTU)

- **NG(ONGC)**
 - Land Fall 2.20
 - HBJ 3.00
- **NG (Private Producers)**
 - NG 3.80
 - R-LNG 5.00
- **Naphtha** 13.0
- **Fuel Oil** 8.0

* Indicative prices

13

Delivered Prices of Various Feedstocks (for Fertilisers) in India



14

NG Price in Urea Exporting Countries

- **Price in Middle East , Russia , Ukraine , Venezuela , Trinidad and Tobago**

US \$ 0.75 – 1.10 per MMBTU

15

Indian Coal as Feedstock

- * **High Ash Coal**
- * **High Ash Fusion Temperature**
- * **Low Sulphur**
- * **Technologies Applied in the World to Low Ash Coal**
- * **Non-Availability of Coal of Consistent Quality**
- * **Beneficiation of Coal**
- * **High Investment**
- * **Overall Cost of Production Competitive with Naphtha and LNG**

16

UREA DEMAND SUPPLY 2011-12

(FIGURE IN MILLION MT)

PROJECTED DEMAND	27.42
EXPECTED DOMESTIC SUPPLY	20.00
INCREASE IN DOMESTIC CAPACITY	5.00
IMPORT FROM JV IN OMAN	1.60
LIKELY IMPORT	1.00

17

GAS REQUIREMENT

(IN MMSCMD)

• FOR PRESENT CAPACITY	33
• DE-BOTTLENECKING +NEW PROJECTS	10
• FOR FEEDSTOCK CHANGE	16
TOTAL	59
PRESENT SUPPLY	31
ADDITIONAL SUPPLY REQUIRED	28

18

Additional Domestic Natural Gas

Field	Quantity	Likely Time
K.G.Basin	40-60 MMSCMD	2008
Gujarat	20 MMSCMD	2006
Coal Bed Methane	13 MMSCMD	3-4 years

19

ADDITIONAL GAS FROM IMPORTS

1. On land Pipeline through Pakistan (2270 KM) 50MMSCMD
2. LNG FROM MAYNMAR 15 MMSCMD
3. Liquefied Natural Gas (LNG) through tankers. 40 MMSCMD

20

LNG TERMINALS

Company	Port	Quantity (million Tonnes)	Status
1. Petronet LNG	Dahej	5.0	In operation
3. Shell	Hazira	3.0	In operation
4. Dhabol Power Gas	Dhabol	5.0	Expected in 2006
5. Petronet LNG	Kochi	2.5	Planned for 2009
5. Petronet LNG Expn.	Dahej	5.0	Planned for 2009

21

Coal Requirement for Utilities in Fertiliser Plants

- Total Requirement 3.2 million MT
- Source Domestic/Imported
- Problems

Domestic	Quality / Availability
Imported	Logistics/ Price

22

Feedstock Issues

- **Total Energy Accounts for Almost 90% of Variable Cost of Production of Urea**
- **Pricing and Availability will Determine Viability of the Sector**
- **Feedstock at Competitive Price**
- **Need for an Independent Regulator to Oversee And Regulate Allocation and Pricing**

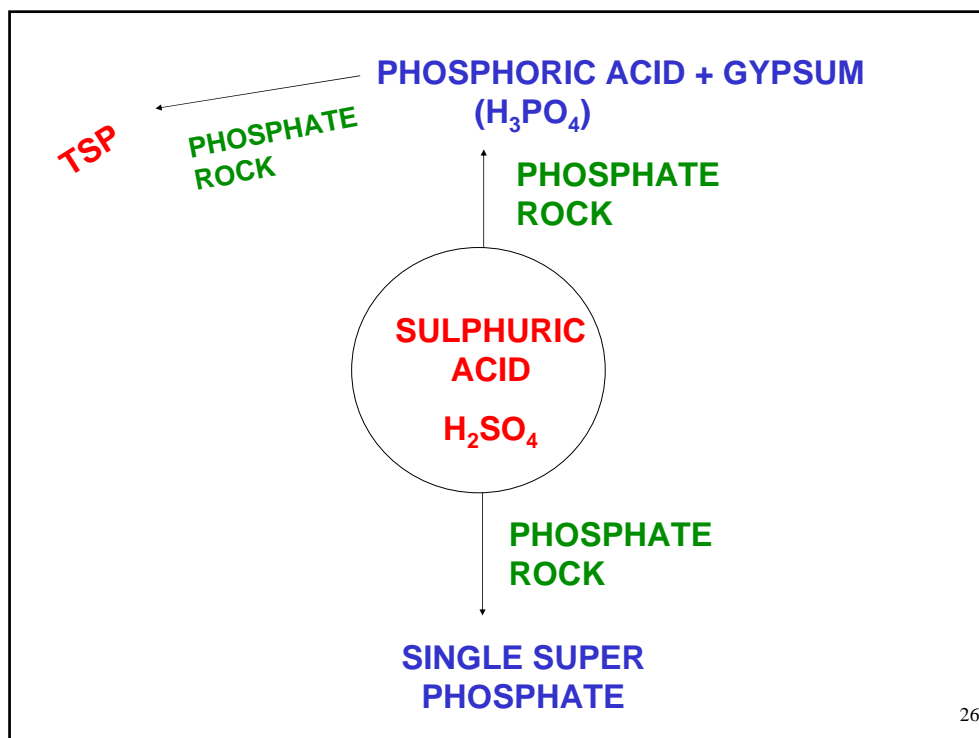
23

Strategies for Future

- 1. Feedstock Changeover from Non Gas to Gas Feedstock**
- 2. Domestic Natural Gas (K G Basin)**
- 3. Imported LNG**
- 4. Import Natural gas through Pipeline**
- 5. Import of Natural Gas as CNG**

24

II. PHOSPHATIC & COMPLEX FERTILISERS



PRODUCTION OF PHOSPATIC FERTILISER IN MMT(2004-05)

• SSP	2.4
• DAP	5.2
• COMPLEXES	5.3
TOTAL AS PRODUCT	12.9
TOTAL AS P ₂ O ₅	4.03

27

Feedstocks/Raw materials & Intermediates

Phosphatic Fertilizers Raw Materials

- Phosphate Rock
- Sulphur

Phosphatic Fertilizers Intermediates

- Ammonia
- Phosphoric Acid
- Sulphuric Acid

Potassic Fertilizers

- Mined Potassic Minerals
- MOP From Sea Water (Sea Bitten)

28

Raw Material Consumption (2004-05)

Raw Material	Consumption
Phosphate Rock	
➤ Indigenous	1.4 million tonnes
➤ Imported	4.8 million tonnes
Sulphur(Imported)	2.0 million tonnes
Phosphoric Acid	
➤ Indigenous	1.27 million tonnes
➤ Imported	2.35 million tonnes
Ammonia	
➤ Indigenous	12.8 million tonnes
➤ Imported	1.6 million tonnes
Muriate of Potash(Imported)	3.4 million tonnes
Sulphate of Potash(Imported)	0.03 million tonnes

29

Share of Raw Materials in P₂O₅ Production 2004-05

Raw Material	Quantity (MMT)	Share (%)
Indigenous Rock Phosphate	0.45	10.34
Imported Phosphate Rock	1.55	35.64
Imported Phos Acid (P ₂ O ₅)	2.35	54.02
Total	4.35	100.0

30

Projection for P₂O₅ Consumption in million MT

• 2005-06 (actual)	5.298
• 2006-07 (Estimated)	5.633
• 2007-08	5.925
• 2008-09	6.200
• 2009-10	6.470
• 2010-11	6.742
• 2011-12	7.022

31

Envisaged Supply Of P₂O₅ in 2011-12

• Domestic	
FROM SSP	0.74
FROM DAP/ COMPLEXES	4.51
• ENVISAGED IMPORT OF DAP	1.75
TOTAL P ₂ O ₅	7.0

32

PROJECTED RAW MATERIAL SUPPLY IN 2011-12 (as P₂O₅)

- FROM DOMESTIC ROCK 0.8 MMT
- FROM IMPORTED ROCK 2.5 MMT
- THROUGH IMPORTED
PHOS ACID 3.2 MMT
- TOTAL 6.5 MMT

33

PHOSPHORIC ACID SUPPLY IN 2011-12

- DOMESTIC PROD OF PHOS
ACID AS P₂O₅ 1.8 MMT
- IMPORT OF PHOS ACID 3.2 MMT

34

Mechanism for P₂O₅ (Phosphoric Acid) Imports

1. Jt. Ventures
2. Group of Buyers
3. Open Market

35

Ventures for Phosphoric Acid

Existing

- SPIC + Jordan Chemicals, Jordan
 - GOI + IFFCO + SPIC + ICS-Senegal
 - Tata + Chambal + Morocco
 - CoromandalL + PHOSKOR-SA
- Under consideration / Planned
- GSFC + COROMANDAL + GCT-Tunisia
 - GCT-Tunisia + GODAVARI
 - IFFCO + EGYPT (Proposed with full buy back)

36

Efforts for Increasing Availability of Indigenous Rock Phosphate

- Prospecting of phosphate deposits by Geological Survey of India
- Development of New Mines
- Allowing Private Sector to Participate in mining
- Installation of Beneficiation Plants

37

AVAILABILITY OF SULPHUR

REQUIREMENT OF SULPHUR :

2 MMT / ANNUM

DOMESTIC AVAILABILITY/ANNUM

- COPPER SMELTERS (HINDALCO+
STERLITE) 0.20 MMT
- RECOVERED SULPHUR FROM OIL
REFINERIES 0.40 MMT

IMPORTED SULPHUR : 1.4 MMT

38

Strategies for Future

- 1. Optimised raw material procurement**
- 2. Joint Ventures Abroad**

39

THANK YOU

40