

Indian Chlor-Alkali Industry – REGIONAL REPORT

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AMAI-ORGANISATION

AMAI-ORGANIZATION

AMAI

AMAI-- Apex body of Indian Chlor-Alkali Industry, established in 1960, registered in 1977, a Non-Profit Public Limited Company under Section 25 of Companies Act, 1956. Is funded through subscription from its members. Co-ordinates with---

GOVT. OF INDIA

Ministry of Power,
Environment,
Chemicals, Commerce &
Industry, Finance,
Antidumping & Safeguard
Duties Authorities, etc.

GLOBAL AFFILIATIONS

Euro Chlor
World Chlorine
Council
The Chlorine Institute
American Chemistry
Council

AMAI

REGULATORY BODIES Bureau
of Indian Standards, Central
Pollution Control Board
(CPCB), States PCB, Deptt. of
Explosives, Bureau of Energy
Efficiency, Central Electricity
Regulatory Commission, Salt
Commissioner, etc.

LOCAL ASSOCIATIONS
Indian Chemical Council
Federation of Indian
Chambers of Commerce &
Industry
Confederation of Indian
Industry
Chemicals Export Council

MISSION

"Represent the Indian Chlor-Alkali industry nationally and globally and facilitate the industry's commitment to technological and economic growth, continuous improvement in protecting human health and environment, guided by sound science, technology and risk management principles. AMAI will achieve this by proactively promoting the industry through practices that are fair, inclusive and sustainable."

ALKALI MANUFACTURERS' ASSOCIATION OF INDIA

- **Represent Chlor-Alkali Industry before Govt. of India, Regulatory bodies & International bodies, etc.**
- **Disseminate information & educate members on rules, regulations, laws, etc., and ensure compliance.**
- **Act from Local, Regional & Global perspectives to sustain the Industry.**
- **Continuously promote operational safety, energy & resource conservation, sustainable development, products usage, environment protection, regulatory compliances, etc.**
- **Promote sharing of best available practices, any incidents & lessons thereof.**
- **Promote usage of Chlorine and Hydrogen thro' opportunities in their derivatives industries.**
- **Review & Advise on Industry related Standards/code of Practices.**

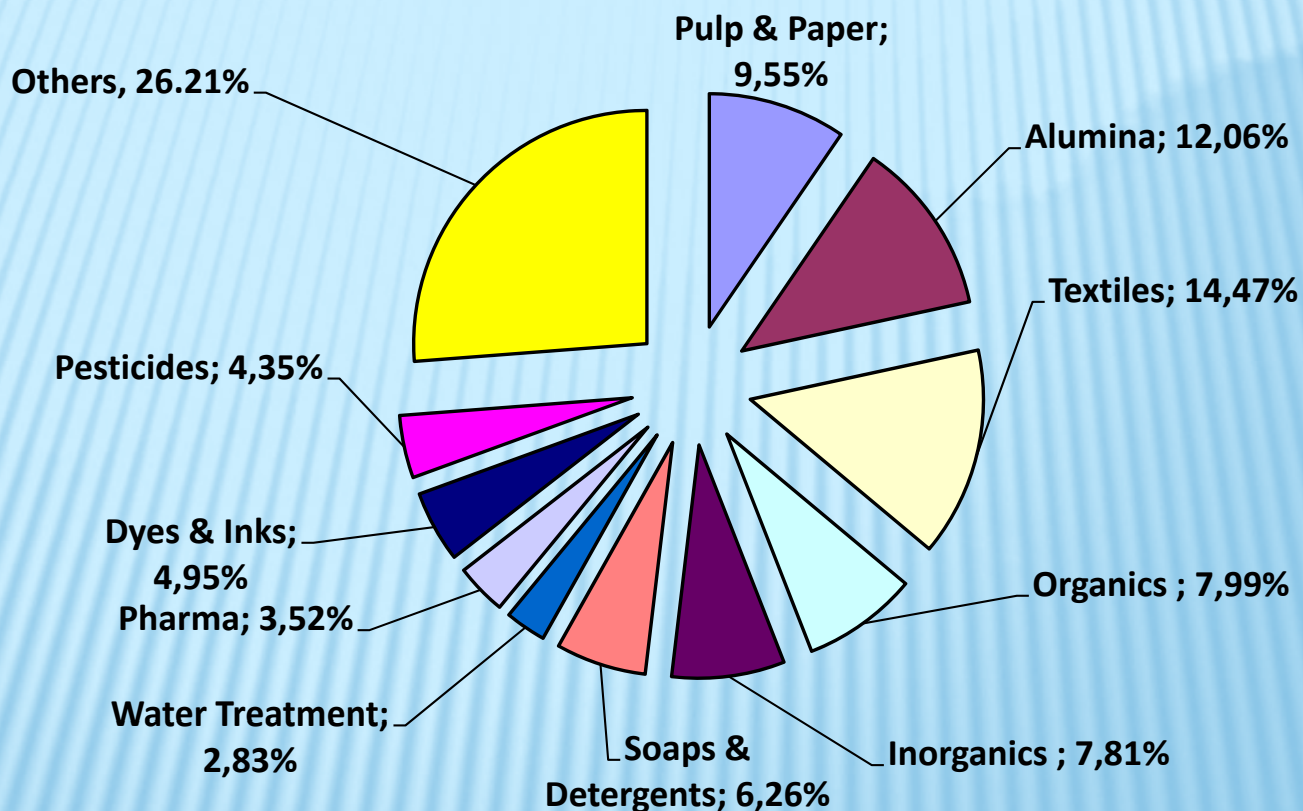
- **Regular Seminars/Trainings on SHE & Regulatory issues and technological developments to educate industry & stakeholders.**
- **Publish literature for Industry / Stakeholders on Technical, SHE, Chlorine Safety, Chlorination of Water, etc.**
- **SHE Committee(constituted in Nov.,08) to promote education & compliance of SHE regulations/practices by Industry.**
- **Operating Chlorine Emergency Response Network (CERN), throughout the country with launch of single toll free no. “1800-11-1735”, since April,2013.**
- **Sharing information relating to SHE and Chlorine accidents within Industry and at Global level thro’ GST.**
- **Co-ordinating between Industry & Bureau of Energy Efficiency(BEE), Govt., of India to achieve 5% Energy reduction by each designated consumer plant by March,2015, over their past 3 years average energy consumption, through PAT (Perform, Achieve & Trade) scheme, of BEE, under Energy Conservation Act, 2001.**

OVERVIEW OF INDIAN CHLOR-ALKALI INDUSTRY

- **Present Capacity : 3.3 mmtpa; production in 2013-14: 2.6 mmtpa; Plant utilisation rate—80% in 2013-14.**
- **Capacity & Demand CAGR for last 5 Years : 4% & 3.5 %.**
- **Expected Capacity by 2015-16 : 3.7 mmtpa @ CAGR of 4.4%.**
- **Most units are Merchant Units. Some are world scale-up to 900 tpd.**
- **35 plants located throughout country; 56% of Capacity in West.**
- **Almost entire capacity based on green state-of-the-art membrane cell technology.**
- **82% of Industry has captive power, as state utility power cost is high in India.**
- **Caustic Driven Market. Chlorine demand lacking as bulk users chlorine derivatives industry, yet to be developed. Chlorine demand setting a limit to capacity growth.**
- **High energy & transport costs.**

GROWTH DRIVERS FOR CAUSTIC SODA INDUSTRY

SECTORWISE CAUSTIC SODA CONSUMPTION DURING 2013-14



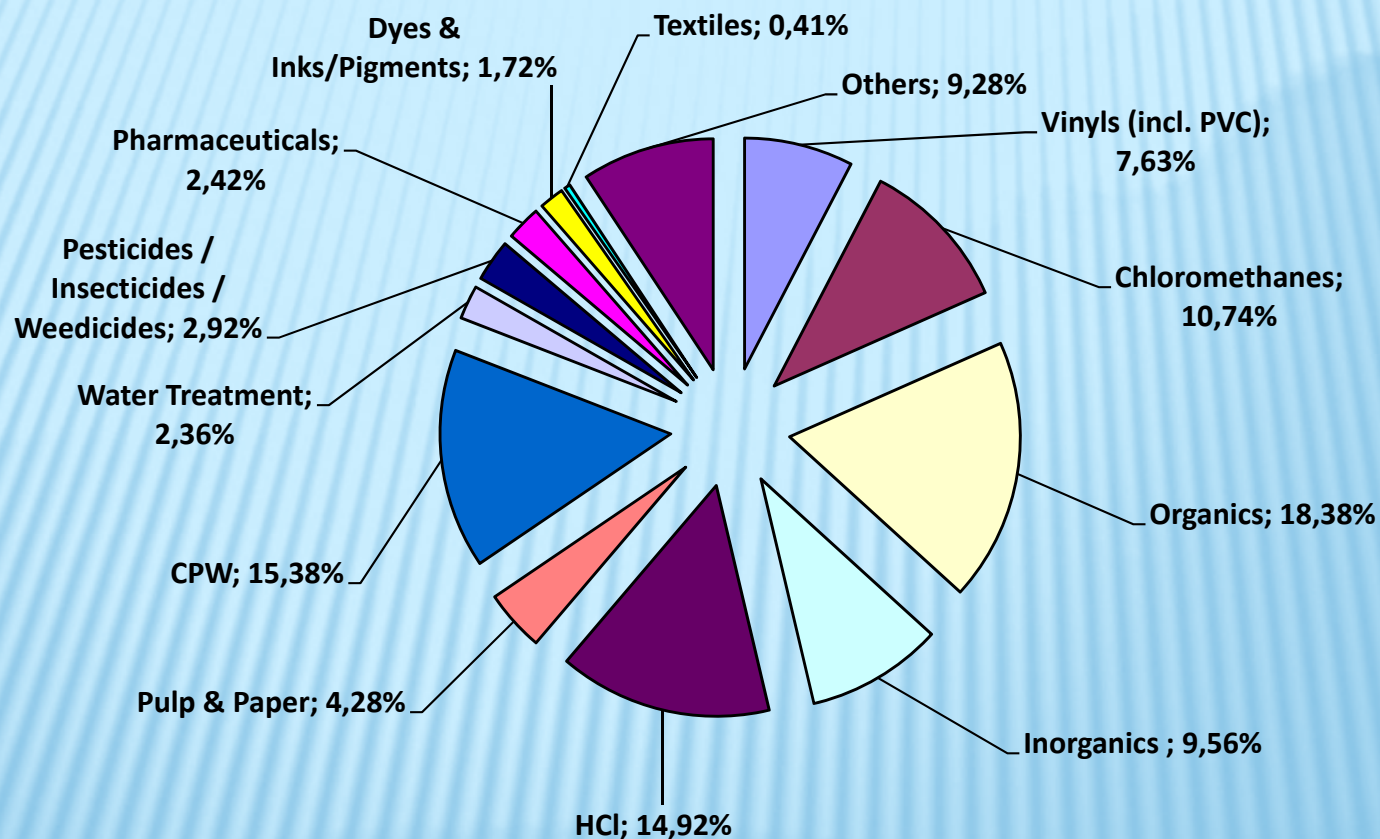
Caustic soda growth in India is imperative due to growing caustic consuming industries like alumina at CAGR of 8%, textiles at CAGR of 9% and inorganic chemical industry at CAGR of 14%.

ALUMINA, TEXTILE, SOAPS/DETERGENTS INDUSTRIES

- Alumina/Aluminum is main demand driver; steady demand growth expected from this industry. India's primary Aluminum consumption expected to grow @ 8% in next decade.
- India's rich bauxite mineral base of "3 billion tons" renders a competitive edge to Indian industry, as one of lowest cost producers globally.
- Other drivers are viscose fiber & polyester yarn, soaps & detergents & downstream chemicals. Expected demand growth for VSF & PSF at CAGR of 6-7% in next 5 years.
- Textile Fiber per capita consumption is just 4-5 kg in India as compared to 11.5 kg globally; indicates huge potential for synthetic textile fibers with growing population & rising aspirations.
- Similarly for soaps & detergents.
- Downstream chemicals viz., inorganic/organic/pesticides/pharma intermediates etc., expected growth rate at 10%.

CHLORINE DERIVATIVES & THEIR GROWTH IN INDIA

SECTORWISE CHLORINE CONSUMPTION DURING 2013-14



Chlorine growth in India remains limited, due to lack of merchant feed stocks, for high/bulk Chlorine consuming agro-chemicals industry. Just 8% in vinyl industry due to this factor. Consumption in pulp and paper declining.

CHLORINE DERIVATIVES & THEIR GROWTH IN INDIA

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- **Globally, Caustic Chlorine Industry is driven by demand-supply of Chlorine; however, in India, key demand driver is Caustic Soda.**
- **Urgent need to promote Chlorine Derivatives Industry; a vibrant bulk chlorine consuming petro-chemical industry, like PVC, Chloro-Methanes/HCFC/PTFE, Propylene Oxide/Glycol, Epichlorohydrin, Polycarbonates, TDI/MDI, etc needed to use surplus Chlorine.**
- **Enormous potential to produce Chlorine compounds by utilizing surplus Chlorine. India can be manufacturing base to meet regional demand. India's per capita Chlorine consumption only 1.85 kgs against Germany 55 kg, US 45 kg, China 13 kg & Brazil 7.8 kg.**
- **Issue in India is most plants merchant; integrated plants with downstream chlorine derivatives only 41% of capacity. Need to promote integration of units with chlorine derivatives production, also to minimize transport risks.**
- **Also need to promote widespread chlorine usage for disinfection of drinking water.**

**JOURNEY TOWARDS IMPROVED SAFETY, HEALTH
& ENVIRONMENT, GREEN MANUFACTURING
AND SUSTAINABLE GROWTH**

- **Safety---** a high priority area for AMAI; SHE Committee formed in November 2008, to encourage adoption of best safety practices, bring in responsible care, address issues on climate change ,etc.
- **Industry conducts hazop & hazon studies, onsite & offsite emergency plan, safety workshops, periodic safety audits regular training programmes on safe handling of Chlorine for Plant Personnel, Transporters, Drivers, Consumers, Support staff, etc.**
- **Industry acquiring quality, environment, safety, health & energy management system certifications:- almost 100% have ISO 9001 & ISO 14001, 70% have OHSAS 18001, & some units also SA 8000 & ISO 50001.**
- **Entire Industry is signatory to WCC safety commitment, & represented at Global Safety Team of WCC.**

- **AMAI launched chlorine emergency response network (CERN) to cover entire India; to immediately respond to any chlorine emergency, anywhere in the country, anytime. Safe transportation top priority of industry; becomes reality with CERN initiative.**
- **Networking of all regional response centers through a single toll free number “1800-11-1735”, commissioned successfully in April 2013.**
- **AMAI conducted 19 training programmes on CERN , safe handling of chlorine and emergency preparedness during 2013-14 at different plant sites for operators, drivers, transporters, consumers assisted units and other stakeholders.**
- **AMAI also trained some major chlorine consumers in each region to develop them as “assisted units”, to take their help/support during emergency, to reduce response time.**
- **AMAI plans to integrate CERN with respective States Disaster Management Authorities; already initiated with Gujarat.**
- **Since the commissioning of CERN, 5 no. of chlorine incidents have been handled successfully using CERN network.**

ENVIRONMENT MANAGEMENT THROUGH GREEN MANUFACTURING

AMAI

➤ **USE OF CLEAN ENERGY :-**

- Promotion on gainful usage of Hydrogen—now almost 90% utilization, thro' usage as fuel in flakes plant, in boiler and sale as compressed Hydrogen.

➤ **WATER CONSERVATION AND LONG TERM VISION TO ACHIEVE ZERO EFFLUENT DISCHARGE :-**

- Industry working towards Zero Effluent Discharge Mission & recycle entire Liquid Effluents generated within the plant
- Installed R O plant to recycle fresh water recovered from liquid effluent back to system, & use of reject water for toilet, gardening, hydrant system etc.

➤ **REUSE OF FLY ASH & BRINE SLUDGE :-**

- Brine Sludge from Membrane plants is non-hazardous—technology being developed to make construction bricks/blocks.
- Reuse of fly ash generated in coal based CPPs - Over 60% of Fly Ash generated today, is being gainfully utilized.

With low emissions, zero discharge & all solid waste utilization, **Target to make Industry "GREEN".**

- **Today almost entire Indian chlor alkali industry is based on Membrane Cell Technology;**
- **Achieved thro' "CREP" voluntary agreement with Government of India & pro-active approach of Industry, without any financial incentives or assistance or special policies by the Government.**
- **Continuous adoption of advanced latest generation of Electrolyzers, most energy efficient membranes & coatings for electrodes, to achieve energy efficiency.**
- **Advanced materials of construction & advancements in the equipment and spares, etc. ensures "state-of-the-art" industry.**

JOURNEY TOWARDS SUSTAINABILITY PROMOTING PRODUCTS END USAGE AND QUALITY

AMAI

- **Campaigns to promote usage of Chlorine for disinfection of drinking water thro' publications, workshops, training programs, as some ozone manufacturers pursuing replacement of chlorine with ozone.**
- **AMAI has instituted National Water Chlorination DaY, (20 September every year), to make general public and Jal Boards aware of the benefits of water chlorination. First time celebrated on 20.09.2012.**
- **Given huge reserves of Bauxite (3 billion Tons) and Alumina Industry growing @ 8% per annum, Caustic demand growth for Alumina Industry is imperative.**
- **India could be a potential hub for manufacturing Chlorine based products in view of availability of Surplus & Cheap Chlorine.**
- **Voluntary initiative by AMAI for up-gradation of Quality and Standardization of caustic soda & HCl products through Bureau of Indian Standards; to specify only membrane grade, mercury/asbestos free products, for consumers.**

REGULATORY ASPECTS FOR INDIAN CHLOR-ALKALI INDUSTRY

- **GOI, Ministry of Power launched PAT (Perform, Achieve & Trade) Scheme in March,2012, under Energy Conservation Act, 2001 for Power Intensive Industries including Chlor-Alkali. Industry asked to reduce Specific Energy Consumption(SEC) by 5% from their baseline SEC (derived based on average of last 3 years energy consumption), by March,2015.**
- **Enactment of the Electricity Act, 2003, mandates non-discriminatory open access of power, enabling industry to purchase & trade power in open market. Industry not able to fully realize benefit of this scheme, due to Govt. owned state electricity boards (SEBs) imposing high wheeling & cross subsidy charges, despite Ministry of Power ruling that distribution companies can not prevent bulk consumers from buying power from alternate sources.**
- **Industry's initiatives to install captive power, to remain competitive, has also been thwarted by SEBs, by imposing high electricity duty & cess (non-vatable), rendering energy cost, almost same as grid power.**
- **To promote Renewable Energy, Government has taken initiative to provide incentives for generation of Non-conventional energy, Industry have voluntarily installed wind mills, biomass based power plants & solar plants.**

- **To promote use of Renewable energy, GOI made it mandatory under Electricity Act, 2003, to use certain fixed %age (varies statewise) of Renewable Energy. Industry either has to use or purchase RECs, traded in Power Exchanges.**
- **Ministry of Environment & Forests in October 2013 have asked 17 industry sectors including chlor-alkali to install online continuous monitoring systems, with parallel display in SPCB's offices, for gaseous emissions & liquid effluents, by 31.03.2015, else pay heavy penalties.**
- **Change in government policies like increasing initial validity period of industrial license from 2 to 3 years, easing environmental clearance procedures for new projects & expansions, would give fillip to ease in establishing business in India.**
- **As per the Government Directive, each industry should have Onsite and Offsite Emergency Preparedness Plan, which is reviewed periodically.**

- **The new Companies Act 2012**, stipulates min 2% of average profit for last 3 years, to be spent on Corporate Social Responsibility (CSR). Mandatory & not voluntary compliance. Environmental sustainability is one of the area to be promoted under CSR spending.
- **Chemical Plant Safety & Security Rating System** – Chemical Ministry proposes this system to create awareness and to ensure safe and secure handling/storage/processing of hazardous, flammable chemicals. Companies with top rating will be incentivized.
- **Minamata Agreement (UNEP)** – India is yet to sign, but it envisages acetylene based PVC production to be stopped by 2025 & mercury use in acetylene based VCM production to be reduced by 50% by 2020.

NEW GOVERNMENT POLICIES – INDUSTRY FRIENDLY

NEW GOVERNMENT POLICIES - INDUSTRY FRIENDLY

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Modi Government target rapid development & growth of the chemical industry. Govt to shortly announce National Chemical Policy, which aims to increase the share of chemical sector in India's GDP from 3% to 10% by 2022, through various initiatives such as :-

- **Ensure availability of feedstock** - proposal to reserve 20% of each feedstock from anchor unit for ancillary downstream units in Petroleum, Chemicals & Petrochemicals Investment Regions(PCPIRs). No restriction on import of feed stocks.
- **Setting up of chemical clusters** – offering special incentives(concession in duties / taxes, tax holidays) for chemical clusters in remote and industrially backward areas.
- **Building enabling infrastructure** – proposed to setup a task-force to resolve infrastructure inadequacies and other chemical industry specific needs
- **Establishing National Chemical Centre** – as a resource centre and national repository of data on chemicals
- **Evolving a chemical management framework; promoting safety & security**
- **Facilitating fast-track project clearances**, technology up-gradation, expansions and skill developments
- **Addressing environmental concerns and adopting green technologies** – automatic clearance route for green chemistry based chemical units. Also for expansion of existing units to the extent of 25% every year provided there is no increase in total pollution load.
- **Fostering innovations and encouraging R & D**

The above positive moves would lead to development of chemical industry to achieve growth rate of 10% CAGR over the next ten years, even under challenging global economic scenarios .

Other positive moves proposed by government under this policy

- The thrust areas include specialty chemicals, agro-chemicals, green chemicals including bio-fuels, ensuring adequate feedstock availability. Therefore, huge potential for the development of chlorine derivatives.
- Proposed “global quality chemical parks” to be dedicated for manufacture of knowledge & advanced specialty chemicals.
- Consolidation of small capacities – necessary bridge funds/financial assistance to MSMEs for capacity consolidations & relocation to chemical clusters.
- Integrated units / clusters in PCPIRs, with a provision of common infrastructure.
- Govt. to simplify ADD & Safeguard duty mechanism as counter-measures against dumping. Emphasis on domestic production-”Made in India”.
- Import Duties anomalies for feed stocks already rationalized.
- Technology up gradation & innovation fund, to support green projects, to expand capacities to economy of scale, setting up common infrastructure facilities, to support R & D and innovation.

Growth oriented eco-system, with emphasis on “made in India” & local production, R & D, green technologies, infrastructure ,chemical clusters to provide impetus to Indian chemical sector..

UPCOMING EVENTS

- ***Seminar on Caustic Evaporation & Flaking Units and Exhibition on 4 & 5 December 2014 in Gujarat, India.***
- ***Potential of Chlorine Derivatives Industries Conference.***
- ***Caustic Soda & Chlorine Technology Conference, February 2015 .***
- ***WCC Annual Meetings, October 2015, New Delhi, India.***

THANK YOU