

Supply and Storage Expert Group Meeting

Results of the Chlor-Alkali Experts Group in Vienna



Madrid, October 2016

The United Nations Industrial Development Organization



Established:

17 November 1966

Member States: 174

**Staff: from 105
countries all over the
world including field
offices**

HQ: Vienna, Austria

UNIDO- Key Figures

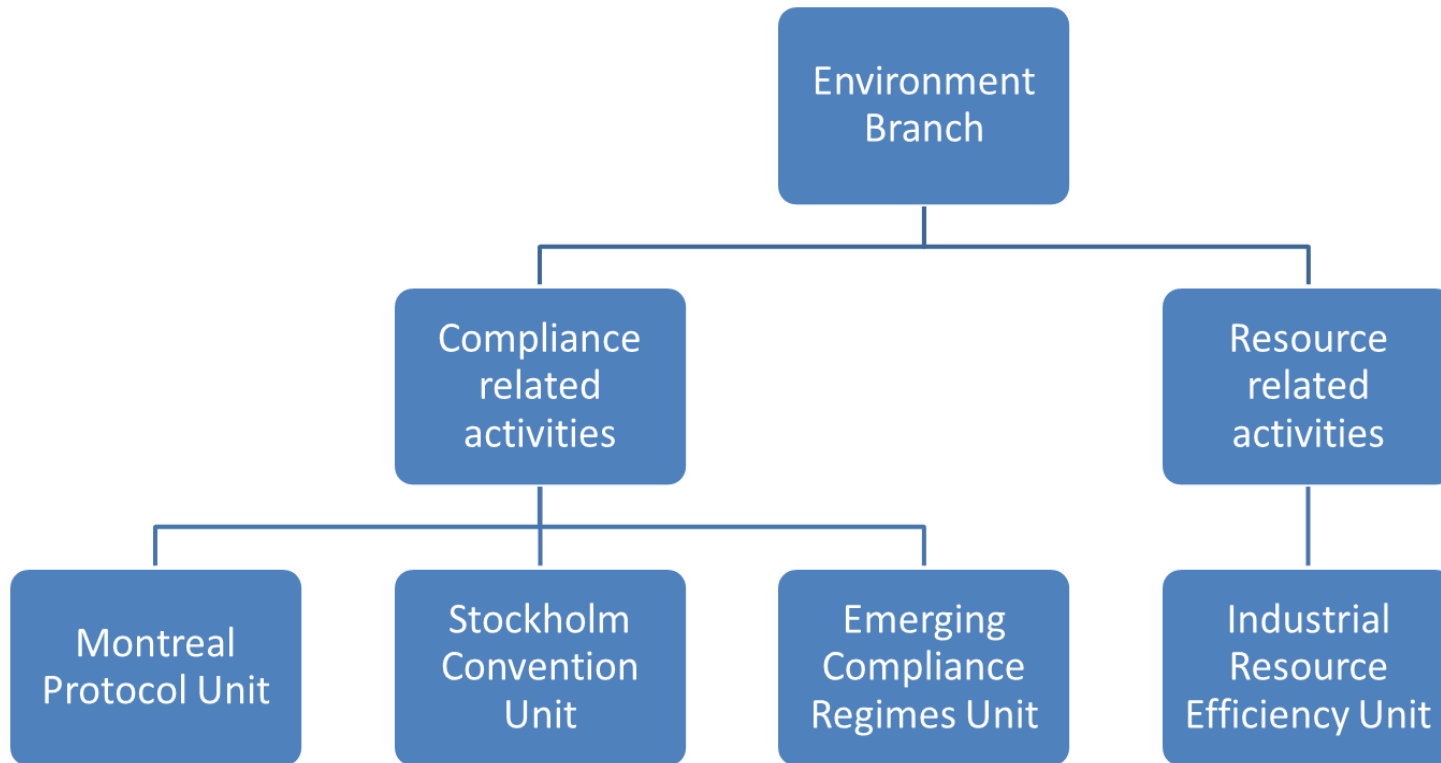
- **Staff on board (non-project) : 700**
- **Budget (regular+operational) : € 173 million (2015-16)**
- **Technical cooperation delivery: \$ 182 million (2015)**
- **Project expert appointments : 2,600 (per year, about 60% from developing countries)**



UNIDO's Mandate

- *Inclusive and Sustainable Industrial Development (ISID)*
- Three focal areas:
 - Poverty reduction through productive activities
 - Trade capacity-building
 - **Energy and environment**
- Energy Branch Mandate:
 - *Sustainable energy solutions for inclusive industrial development*
- Environment Branch Mandate:
 - *Introducing sustainable environmental practices, increasing resource productivity, supporting emerging environment services industries*
- ISID aims to achieve equitable and sustainable social, economic and environmental growth whilst mainstreaming women and youth

STRUCTURE



UNEP Global Mercury Partnership

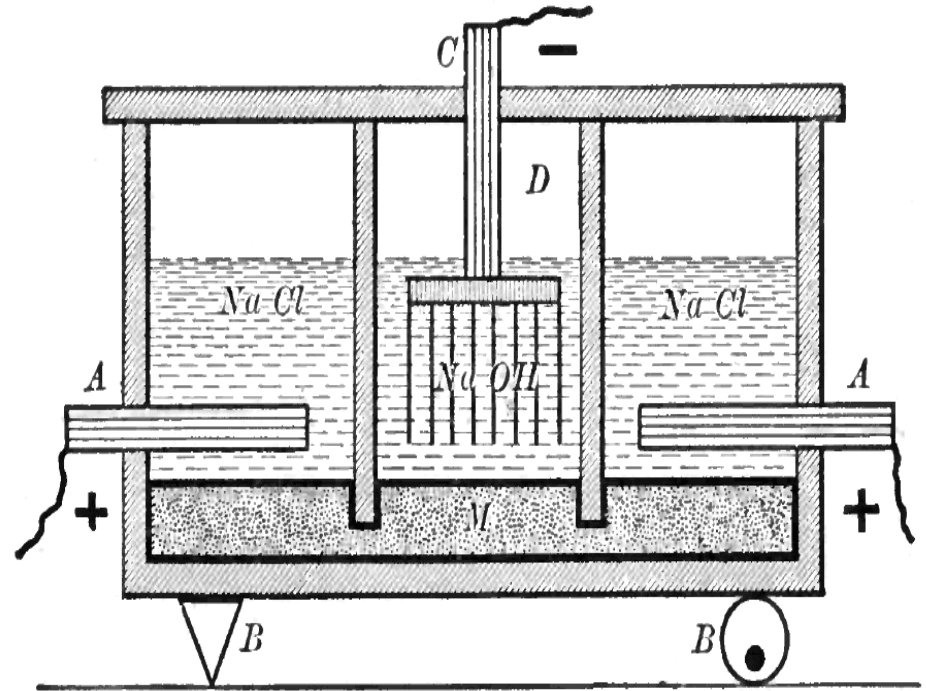
- Assists in the timely ratification and implementation of the Minamata Convention
- Eight Partnership Areas
 1. **Artisanal and Small-scale Gold Mining (ASGM)** (UNIDO, UNEP, NRDC)
 2. Mercury Control from Coal Combustion
 3. **Mercury Reduction in Chlor-Alkali** (UNIDO and US EPA)
 4. Mercury Reduction in Products
 5. Mercury Air Transport and Fate Research
 6. Mercury Waste Management
 7. Mercury Supply and Storage
 8. Mercury Releases from Cement Industry

Expert Group Meeting in Chlor-Alkaline June, 2016, Vienna

- Objective: To analyze the sector in terms of location of the remaining Chlor-Alkali facilities, historical context regarding the development and the adaption of technologies across the sector. The discussion included:
 - Obligations under the Minamata Convention;
 - Mercury consumption and mercury supply to Chlor Alkali plants;
 - Overview on existing plants, including number of facilities and their geographical distribution, mercury consumption, age of facility etc.;
 - Review of current production practices, including global trends and industrial performances;
 - Estimate of mercury stocks from conversion and decommissioning.
- Participants: Representatives from the Industry, (WWC, EURO Chlor, Clorosur, CYDSA, Nomura Khosan, etc.) Governments, (US, Spain,) International Organizations (UNIDO and UNEP) and consultants

Chlor-Alkali Industry

- Industrial Process for the electrolysis of salt (NaCl)
- Produces chlorine and caustic soda (lye)
- Older plants employ mercury cells
- Membrane cells are a proven, mercury-free alternative
 - 20-30% lower electricity consumption
- 2025 phase-out date of mercury under Minamata Convention



Mercury Cell for Chlor-Alkali Process

Industry Serves Two Markets

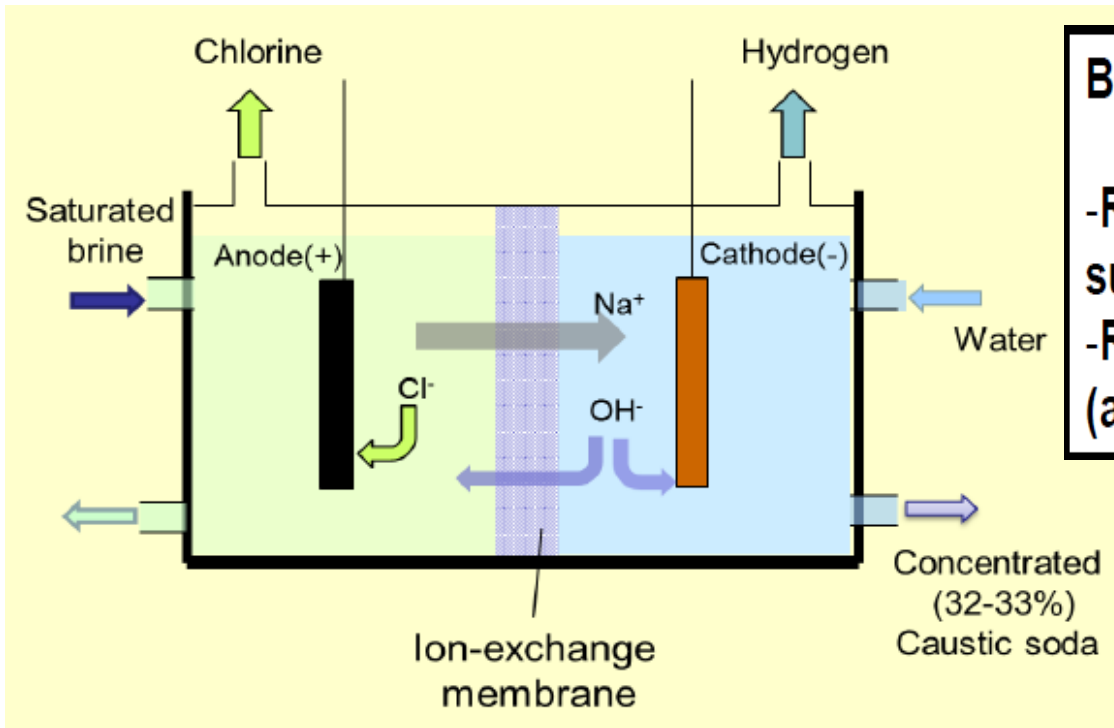
Chlorine

- PVC
- Agrochemicals
- Pharmaceuticals
- Various other products

Caustic Soda

- Organic chemicals
- Paints, glass, ceramics
- Paper, pulp, and cellulose
- Soaps and detergents

Alternative technology options



Benefits from conversion :

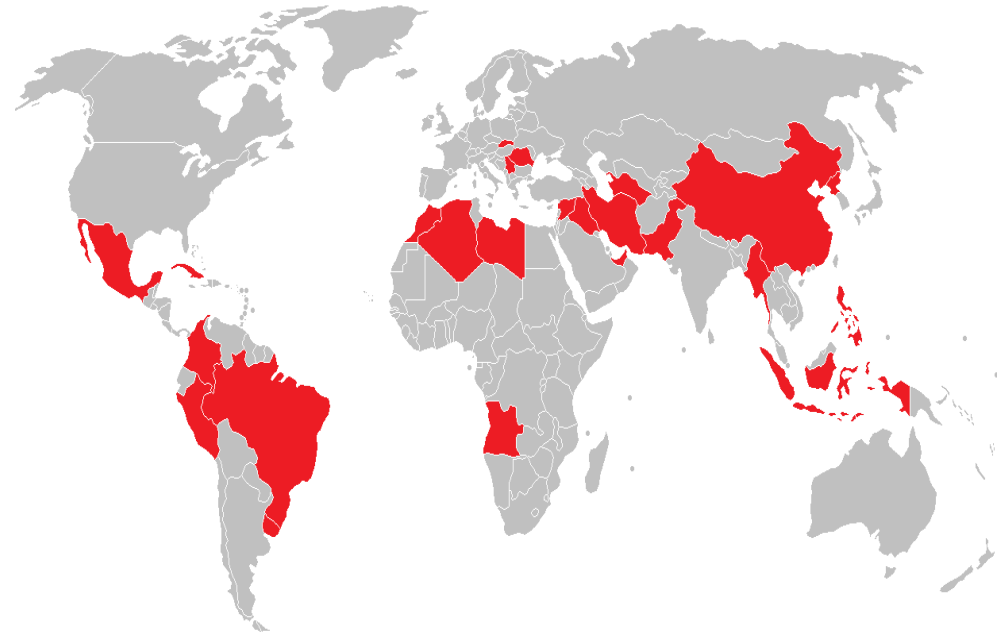
- Reduction in hazardous chemical substances (mercury, asbestos)
- Reduction in consumed energy (approximately 20-30%)

Status of Industry: Conversion Progress in Developed Countries

- Developed world facilities are on track to convert remaining mercury cell facilities to membrane cell technologies
- United States
 - Only 2 mercury cell facilities remaining
- Europe
 - European chlor-alkali industry has pledged to phase out all mercury-cell units by 2020

Status of Industry: Conversion Progress in Developing Countries

- Lower capacity, may need more assistance in conversion from mercury
- Conversion can be a viable economic decision, under certain circumstances
- Less information on developing country plants



Developing Countries with Mercury Cell Plants

Identifying Environmental Challenges

- Site contamination;
- Remediation challenges and available technologies;
- Worker health risks related to mercury exposures;
- Environmental risks;
- Mercury stock management;
- Integrating oversight.

Conversion

- Planning for conversion;
 - Implementing conversion activities;
 - Evaluating facilities for conversion vs new construction;
 - Managing clean-up and transfer of operations.
- Definition of contamination aspects, including contamination standards;
 - Identification of old disposal sites;
 - Identification of contractors that will be involved;
 - Identification of the sequence of the process for shutting down the facility and cleaning it up, including contingencies and buffer timing;
 - Definition of the scope of the reporting;
 - Estimation of costs and the funding sources.
 - The decision between decommissioning and conversion depends on the status of the plant, its efficiency and maintenance needs.

Decommissioning

- Identifying environmental challenges;
- Addressing site and equipment contamination;
- Technologies, modalities, costs and duration.
- Main concerns discussed:
 - The high costs of transportation, treatment and construction of landfills.
 - The on-site treatment of mercury waste would help to reduce these costs
 - The treatment process can take several decades.
 - Stabilization technology for mercury needs to be commercially available, but at the same time, long-term research on the soundness of the technology is still required.

Ensuring Responsible Management of Mercury Stocks

- Identifying changes under the Minamata Convention to managing mercury from plant conversions or closings.
- Regional vs national approaches for mercury stocks and waste management.
- Options for maintaining oversight of mercury stocks and wastes.
- Measures recommended by the MPP to ensure the environmentally sound management of mercury and avoid illegal trade are as follows:
 - Ensure physical security of mercury stocks;
 - Accept control and certification of mercury purity before disposal;
 - Use containers to transport waste, consistent with the Basel Convention;
 - Permanent surveillance and electronic controls when moving mercury;
 - Obligatory chemical identity check when transferring mercury ownership;
 - Record keeping, includes distinguishing between mercury commodity and waste;
 - Frequent external evaluation of mercury stocks and movements, and
 - Public registers to assure openness and transparency.

Next Steps: Institutional Assistance

Topic	Tasks	Organization
Financing	<ul style="list-style-type: none"> - Initiate dialogue with financial institutions, private entities and development banks. Development of communication material. - Investigate sources of financing (e.g. GEF, IFC, EBRD, ADB, EIB) - Investigate the strategy to engage various financial options. 	<ul style="list-style-type: none"> - UNIDO - UNIDO/USEPA - To be decided
Information	<ul style="list-style-type: none"> - Better information on non-WCC facilities, possibly from MIAs. - Understanding business models: input prices, product prices, market conditions, - Energy assessment of alternative technologies. - Information on interim storage, stabilization/solidification and final disposal. - Share with non-WCC companies guidelines for data collection. - Inventory toolkit. - Mapping of relevant regulatory frameworks and legislation. - Identification of possible storage options as well as the suppliers relevant in this respect. 	<ul style="list-style-type: none"> - UNEP/WCC - WCC - UNIDO - Partnership Area - UNEP - Partnership Area - To be decided - To be decided
Planning	<ul style="list-style-type: none"> - Development plans for the management of mercury. - Plans for interim storage, stabilization/solidification and final disposal. - Map the technical capacity of the country to cope with challenges (conversion, remediation, management of mercury, etc.). - Assessment of site contamination. 	<ul style="list-style-type: none"> - Partnership Area - Partnership Area - To be decided - To be decided
Capacity Building	<ul style="list-style-type: none"> - Targeting governments and private sector, on the Minamata Convention and the challenges for the industry. - Data collection on the use of Hg. Foster data collection by non-WCC companies. 	<ul style="list-style-type: none"> - Partnership Area - To be decided
Technology	<ul style="list-style-type: none"> - Conversion technology suppliers: call for expression of interest to assess capacity of supply (to be discussed with UNIDO Procurement Department). - Technology for interim storage, stabilization/solidification and final disposal. 	<ul style="list-style-type: none"> - UNIDO - Partnership Area leads

Thank you for your attention

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