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# The Euro Chlor sustainability program

Ton Manders | Euro Chlor

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# Why a sustainability Program?



## Why a sustainability Program?

### The motive

- Mid '90's the Chlorine Industry had negative publicity:
  - “The Devil’s Element”
  - “The Product is the Poison”
- Based on this, the Industry wanted to demonstrate its contribution to a sustainable society:
  - Environmental security;
  - Societal progress;
  - Economic development.

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## Why a sustainability Program

### The Beginning

- In 2001, Euro Chlor introduced its sustainability program, as one of the first industry sectors in Europe;
  - Transparent and reliable
  - Yearly reports in the annual review and feedback to individual member companies
  - Covers economic, environmental and safety elements
- But in fact it already started in 1977:
  - Euro Chlor predecessor started to measure and report on mercury emissions

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## The parameters

### Safety and Social progress

- Lost time injuries rate
- Process incidents and losses
- Transport incidents

### Economic development

- Uses of chlorine
- Manufacturing route of chlorine
- Energy consumption
- Hydrogen use
- Water usage

### Environmental protection

- Responsible Care implementation
- Chlorinated organic chemical emissions
- Mercury emissions
- Mode of chlorine transportation
- Quantities of chlorine transported
- Product assessments

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## The voluntary commitment

- The first sustainability program (2001-2010):
  - LTI for own personnel and contractors: 1.3 (from 7.5 and 7.8)
  - Process incidents: 75% reduction (from 67 to 15)
  - Emission of Mercury: 1.0 gr/ton capacity as weighted average
  - Chlorinated organic carbons: to water 75% reduction and to air 50%
  - Energy consumption: 5% reduction
  - H<sub>2</sub> utilization: from 80% to 95%


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## The voluntary commitment

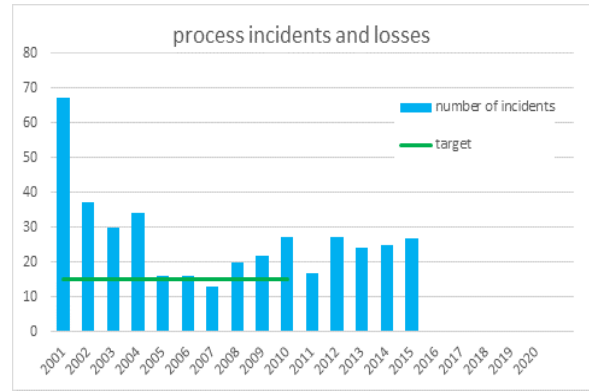
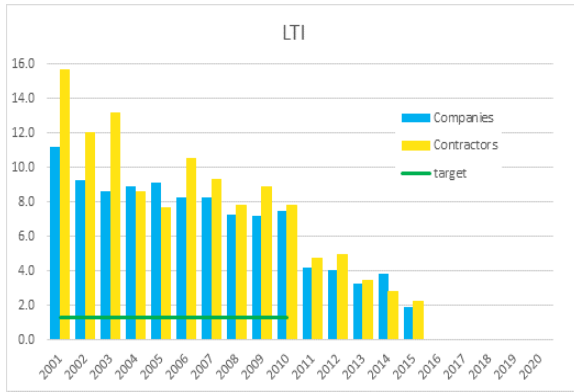
- The second sustainability program (2011-2020):
  - No Commitments
  - Increased focus on safety
  - Emission of Chlorinated Organic Carbons taken out
    - To water 78% reduction achieved (goal was 75%)
    - To air 70% reduction achieved (goal was 50%)
  - More focus on 'weaker' areas via dedicated programs

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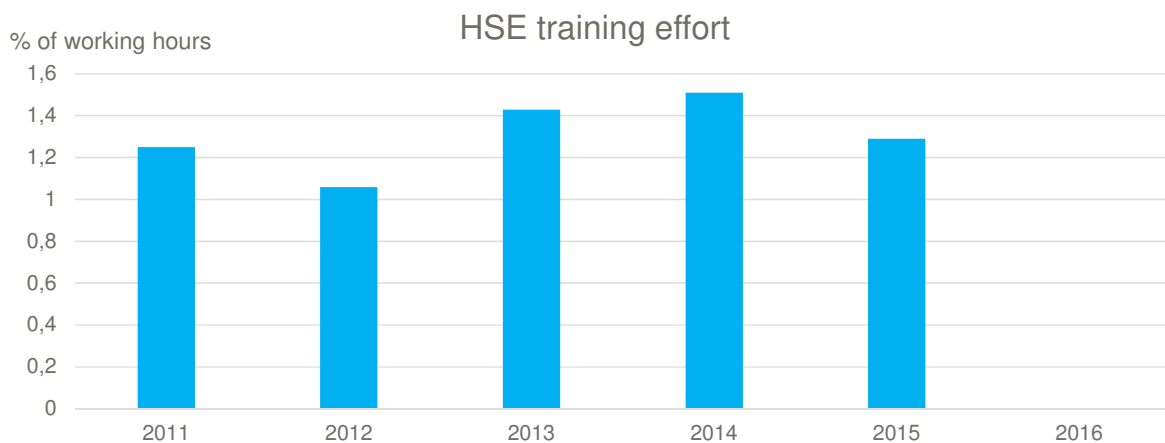
## Results on safety parameters

## LTI and Process Incidents



Targets not realized: see presentation later today on safety initiative

## HSE training inside the companies


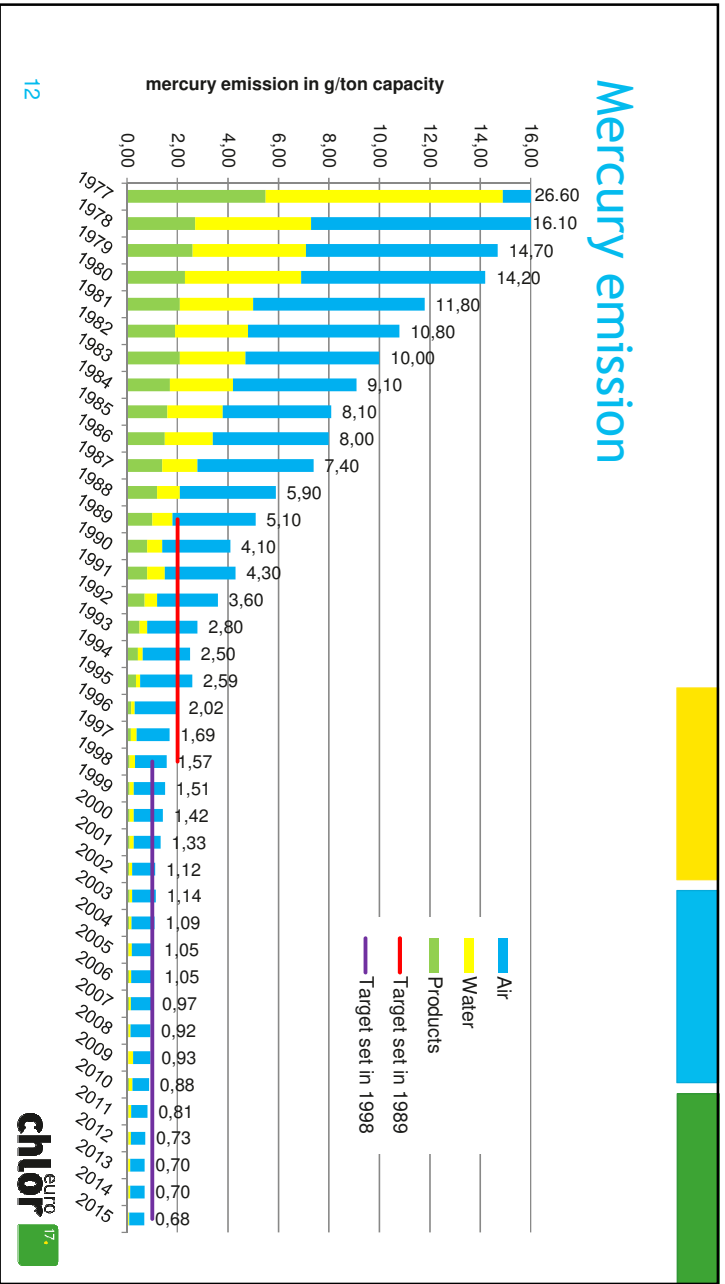




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## Results on environmental protection

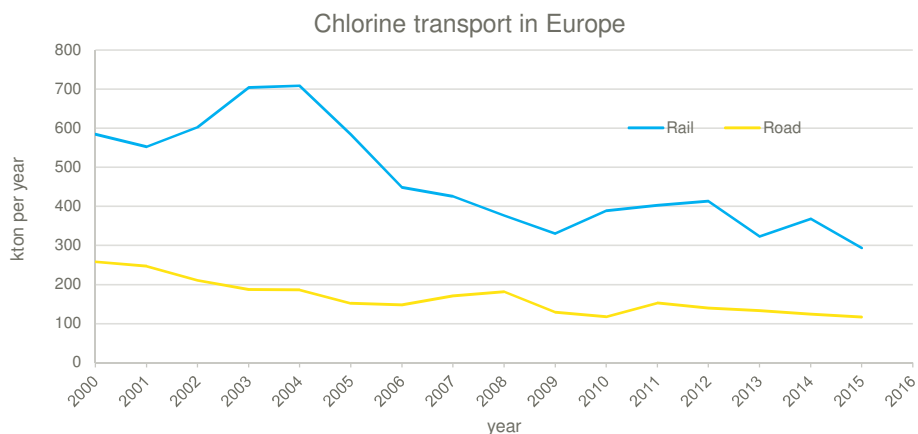
## Mercury emission

- This magnificent result (>97% reduction) was achieved by:
  - Setting targets for the total group of manufactures
    - Re-discussing and setting new targets as soon as target was reached
  - Benchmarking
    - Results were reported back to individual companies to create awareness of their performance in the benchmark
  - Euro Chlor and its members shared best practices
    - Drafting/publishing documents with best practices
    - Workshops to discuss and help members to improve
    - Plant visits with specialists to give advice for improvements

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## Mode of transportation



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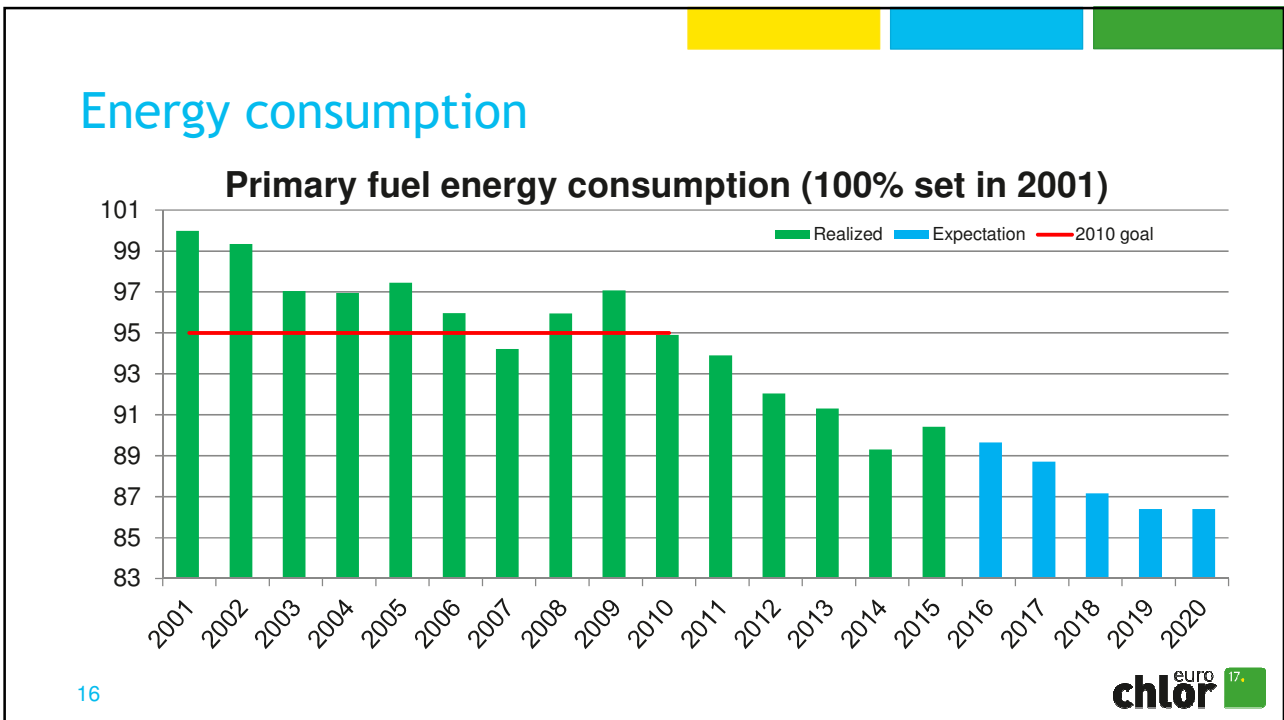




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## Results on economic development







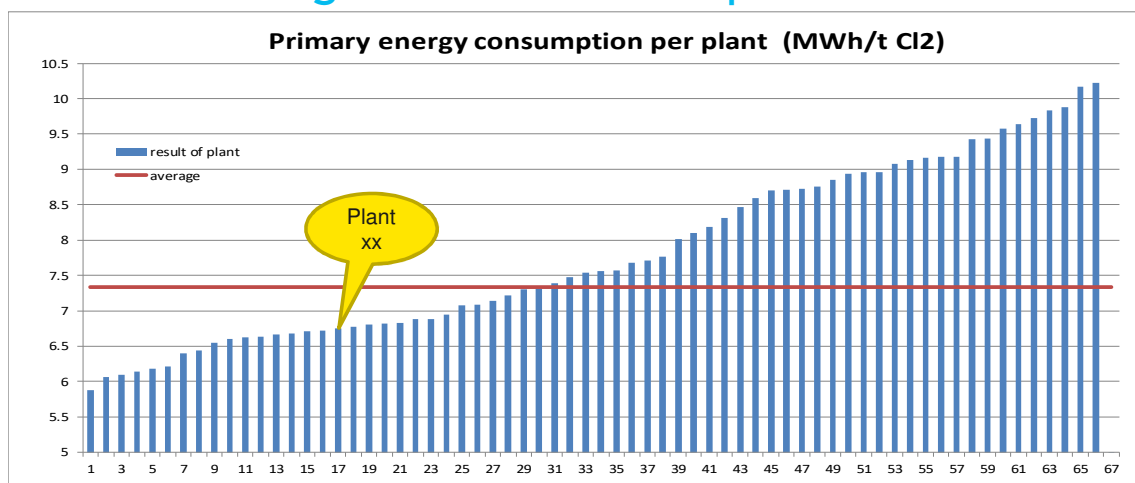
## Energy consumption

- Energy consumption in MWh primary energy per ton
  - Electricity consumption to primary energy based on 42% efficiency
  - Steam based on 0.741 MWh/ton steam
- Reduction based on
  - Mainly - conversion from mercury to membrane
  - Partly - improvement of electrode and membrane performance
- Further decline expected based on conversion of mercury to membrane

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## Energy consumption benchmarking feedback to companies

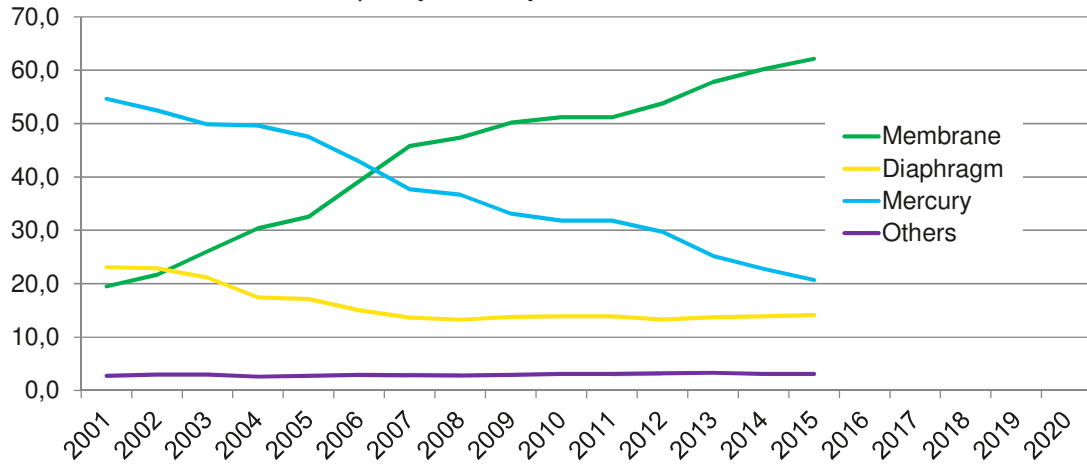


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## Chlorine manufacturing process

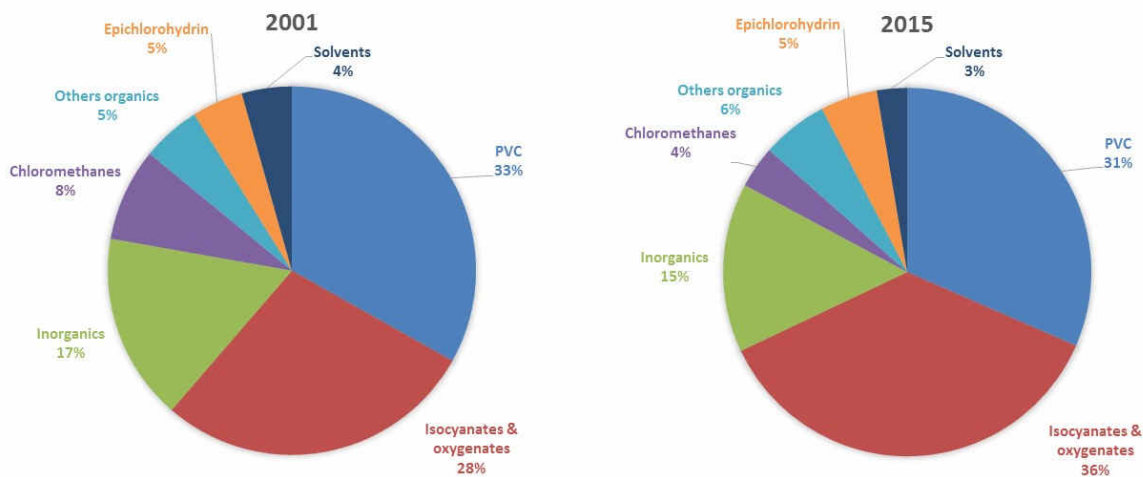
% of total installed capacity end of year



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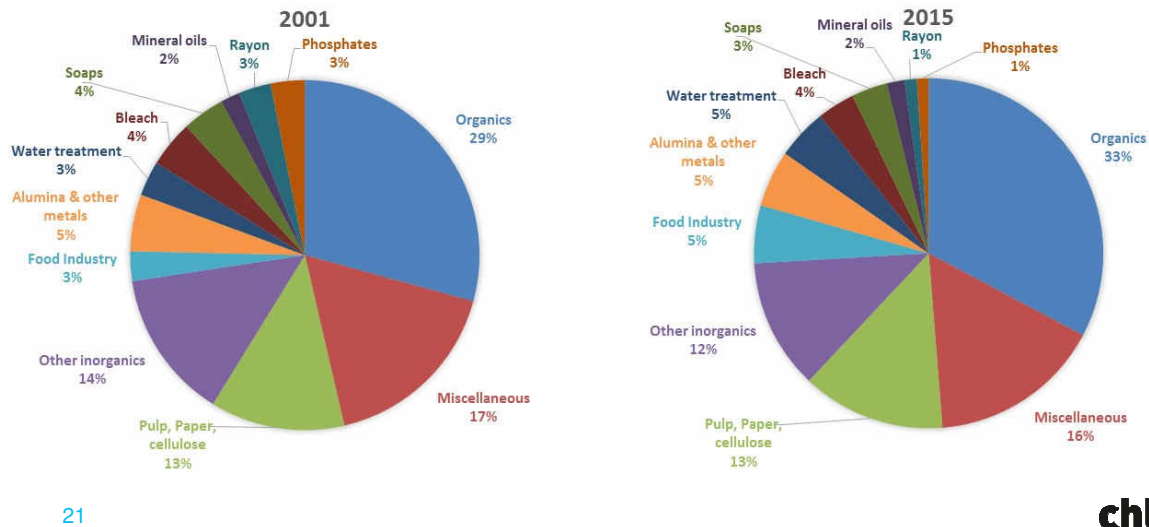
## Chlorine applications



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## Caustic applications




## Conclusions

- Euro Chlor will continue to:
  - Collect the sustainability parameters
  - Report the results back to the individual companies
  - Publish the aggregated results in the annual review
  - Discuss the areas for improvements
  - Implement improvement programs when required

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A black and white photograph of water splashing, with numerous bubbles and droplets visible, creating a dynamic and textured background.

Thank you very much

Ton Manders

