# No Excuses: Communities at Risk Without Mercury-Free Technology

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## Introduction

Four mercury-based chlorine factories in the United States have refused to upgrade to cleaner, newer, mercury-free processes. These "Foul Four" are among the oldest factories in the industry, and collectively emit over a ton of mercury into the environment every year. While 95 percent of chlorine manufacturing in the United States uses mercury-free processes and banks an economic benefit because of it, these last four plants have refused to take that step.

If the Foul Four refuse to modernize their processes to mercury-free technology, it is likely that those factories will close within four to seven years. Three driving forces have come together that threaten the survival of the Foul Four: 1) Bleak market conditions for chlorine, 2) the fact that the Foul Four are reaching the end of their economic lives, and 3) newer, more environmentally friendly chlorine factories that are well-positioned to out-compete these factories. While shuttering the Foul Four would eliminate more than a ton of mercury pollution each year[1], such an event would also cost about 500 jobs.[2] Since shifting to mercury free technology preserves jobs, this bleak scenario is completely preventable.

A shift to mercury-free technology is the best bet for preserving the longevity and profitability of these plants so that they may continue to contribute to their communities. The Foul Four should upgrade to mercury-free technology to preserve jobs, eliminate mercury and ultimately improve the profitability of these factories.

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## The Bleak Chlorine Market

The current situation in the chlorine market is bleak. Factories are having difficulty selling chlorine due to the slump in the housing market and the declining economy.[3] The bright side for the chlor-alkali industry is that caustic soda (produced concurrently with chlorine) is in high demand — prices are reaching 30-year record highs for this basic chemical.[4] However, even with high prices for half of the chlor-alkali business plan, companies are reluctant to expand because of the low chlorine demand.[5] These poor conditions in the chlor-alkali industry could force some factories to close.

Size is also a determining factor in a plant's ability to stay afloat. Historically, companies have cited production capacity as a reason for closure of plants, especially for the smaller factories.[6] Collectively, the Foul Four are among the smallest chlor-alkali factories in the countries, producing less than five percent of the total U.S. chlorine capacity (Table 1). This bodes poorly considering the broader industry trends: between 2006 and 2016, employment in the basic chemical manufacturing industry is expected to "decline rapidly" by 15.8 percent.[8]

**TABLE 1:**
**Chlor-alkali Industry Profile by Process, 2008**

| Process | Facilities | Chlorine Capacity (X1,000 tons) | Percent of Capacity |
|---|---|---|---|
| Diaphragm | 15 | 8541 | 68% |
| Membrane | 11 | 3383 | 27% |
| Mercury | 5 | 631 | 5% |

*Source: KA Steel Chemicals, 2008[7]*

## Foul Four Approach the End of their Economic Lives

Old age has also been a factor in past decisions to close chlor-alkali facilities.[9] Based on the age of the Foul Four and previous experiences, it is likely these last four factories will close instead of converting to mercury-free technology in the near future. Most chlorine factories in the United States that eliminated mercury use converted to mercury-free technology after 30 to 40 years of operation[10] — putting each of the Foul Four well past the average life expectancy. In fact, no chlorine factory in recent United States history has switched to mercury-free technology after it passed the age of 42 — still younger than the Foul Four (See Chart 1).[11]

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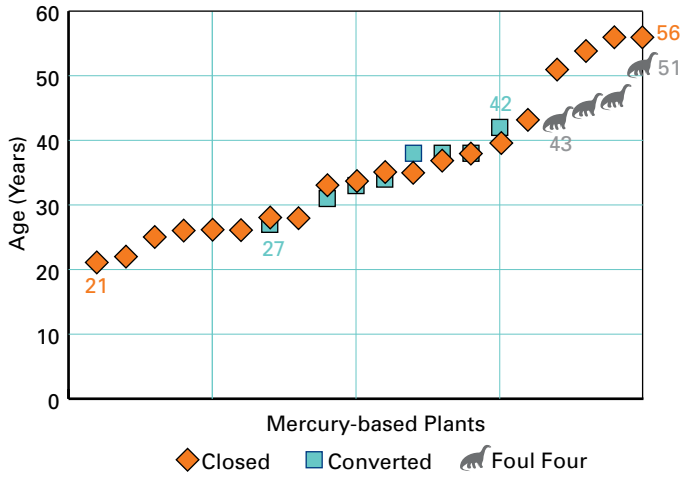
Of the mercury-based chlorine factories that do not convert to newer processes, most shut down prior to 50 years of operation. Only five out of 39 such factories have made it to the half-century mark in recent history.[12] If 50 years is the operational

**CHART 1:**
**The Foul Four Are Chlorine Dinosaurs**




*Source: Compiled by Oceana from industry sources and news articles.[14]*

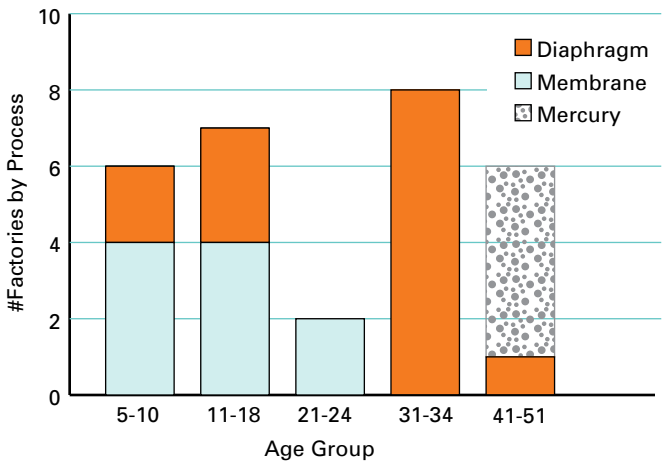
lifespan of the Foul Four, as it has been for the vast majority of the industry, the Olin Corporation factories in Georgia and Tennessee (43 and 46 years old, respectively), and Ashta Chemicals in Ohio (45 years old) could all close in the next four to seven years. Only a small part of the PPG Industries' factory in West Virginia uses mercury; however, this portion of the factory has operated for nearly 51 years, making it the oldest mercury-based unit in the country.[13] The longest a mercury-cell chlorine factory has been known to operate in the United States is 56 years, which suggests that PPG will likely close that portion of the plant within five years. Based on this analysis of industry history, the companies that own the Foul Four are likely to close them soon, unless they upgrade, and such a closure would be likely to occur within four to seven years at most.

***History suggests that the companies that own the Foul Four are likely to close them within four to seven years at most.***

## Newer Plants are Likely to Out-Compete the Foul Four

Even with poor demand for chlorine, several chlor-alkali companies are planning to build more efficient facilities or expand production capacity in the coming years. At least four new chlor-alkali factories using state-of-the-art membrane-cell technology will be up and running between now and 2011.[15] Three other plants will be expanding production capacity in the coming years.[16] In addition to these newer facilities, the rest of the plants in the industry are significantly younger than the Foul Four (See Chart 2).[17]

**CHART 2:**
**The Oldest U.S. Chlorine Factories are Mostly Mercury-Based**




*Source: Compiled by Oceana from industry sources and news articles.*[20]

Competing with these new and expanded facilities will not be easy. Membrane-cell chlor-alkali technology can be as much as 37 percent more energy efficient than mercury-based processes[18] and costs hundreds of thousands of dollars less to operate per unit of chlorine or caustic soda produced.[19] Since the Foul Four are among the oldest and least efficient plants in the country, they net a smaller profit on a given amount of chlorine than the newer plants. This could severely hurt their ability to compete and their long-term viability.

## Bad Excuses

When the Foul Four are asked about their willingness to convert to mercury-free technology, the companies often respond with a few canned corporate arguments expressing concern for local communities. For example, some have argued that shifting would be bad for jobs, that a conversion is not financially feasible or that it would force a closure.[21] In truth, however, mercury-cell technology has no future in the United States and the likelihood of closure is higher if companies do not shift. If these companies were truly concerned about their communities, they would be planning a shift, as it may be the only way to save local jobs.

***The lack of mercury-free technology is much more threatening to local jobs than modernizing would be.***

### *"Job Loss" Can Be Prevented By Converting*

On several occasions, the Foul Four have responded to criticisms of their mercury use by touting the number of employees at the factories[22] — suggesting those jobs would be lost if there were a conversion. This appears to be disingenuous because it is likely these facilities will shut down soon if they do not switch. The lack of mercury-free technology is much more threatening to local jobs than modernizing.

For example, ERCO Worldwide decided last year to begin conversion of its Wisconsin facility to a mercury-free process. The company stated that the factory would have had to close in five to seven years if it did not modernize.[23] However, they point out that the conversion of the ERCO factory will allow jobs to be retained for up to an additional 30 years.[24] This further demonstrates that the fate of the Foul Four may be sealed within four to seven years, and likely fewer, unless they make the shift like ERCO Worldwide.

**TABLE 2:**
**Foul Four Estimated Employment Numbers**

| Facility | Permanent Employees |
|---|---|
| Ashta Chemicals, Ohio | 50-99 |
| Olin Corporation, Georgia | 85 |
| Olin Corporation, Tennessee | 280 |
| PPG Ind., West Virginia (mercury cells) | 60 |

Source: Compiled by Oceana from industry sources and news articles[25]

Besides avoiding job loss, many local jobs are created when a chlor-alkali facility switches to a mercury-free technology. Architects, designers, electricians, plumbers, and mechanics are among the many positions that can be created and are necessary to convert a facility. While these types of jobs are not permanent, some may be available during the entire conversion, which can take up to two years (See Table 3).[26] Converting to mercury-free technology can retain jobs at

**TABLE 3:**
**Hundreds of Local Jobs Can Be Created During Conversion**

| Converted Plant | Year Converted | Length of Conversion | Jobs Created |
|---|---|---|---|
| PPG Industries, Lake Charles, Louisiana | 2007 | 22 months | 250 |
| Olin Corporation, St. Gabriel, Louisiana | 2008 | ~23-26 months | 200 |
| Orica, Laverton North, Australia | 2000 | 14 months | 200 |

Source: Compiled by Oceana from industry sources and news articles[28]

the chlorine factories for the long-term while creating hundreds of jobs in the short-term.

Previous conversions clearly demonstrate the immediate benefits to the local economies around factories that convert to mercury-free technology. The Orica, Olin (Louisiana) and PPG (Louisiana) conversions each created about 200 jobs according to industry and news reports.[27]

## *Conversion "Down Time" Can Be Minimized*

As with any modernization process, a plant may shut down for a short period of time to allow for retrofits. A plant manager for the Olin Corporation has argued that this type of downtime is unacceptable and would interrupt production and impact "the lives of people in this area."[29] However, the Foul Four could minimize downtime for conversion using a variety of proven techniques, including:

- Placing a new building in close proximity to the old cell-room so that chlorine production could essentially continue without ceasing while the new facility is being built.[30]
- Planning any necessary outage during seasonally low-demand periods, such as the first and fourth quarters.[31] Olin Corporation has used this strategy previously to plan maintenance outages for up to seven facilities in a single quarter.[32]
- Installing and constructing parts of the new technology while allowing the mercury-cells to operate until it is time to shut those cells down.[33]
- Implementing a gradual conversion using the same building.[34]
- Re-using some of the same machinery that is not specific to the mercury-cell process, which saves time replacing it.[35]

Not all of these techniques may be usable all of the time; however, Olin Corporation has used several of them in the past.[36] Other chlorine factories also

***If the Foul Four were truly concerned about the communities they operate in, they would switch to mercury-free technology, as it may be the only way to save local jobs.***

have used these techniques and minimized downtime during a conversion (Table 4). Therefore, it is clear that downtime during a conversion can be minimized to a few days, or possibly even eliminated using these proven techniques.

**TABLE 4:**
**Conversion Downtime Can Be Minimal**

| Plant (Country) | Downtime |
|---|---|
| Borregaard (Norway) | 7 weeks |
| Brückl (Austria) | 4 days |
| ERCO Worldwide (USA) | Perhaps none |
| PPG Industries (USA) | Four months |
| Westlake Chemical (USA) | A few weeks |

Source:
Compiled by Oceana from industry sources and news articles[37]

***The Foul Four collectively emitted over a ton of mercury into the air in 2006.***

## *"Reducing" Isn't Eliminating Mercury*

One of the most used statistics by the Foul Four is that an individual facility has reduced mercury pollution by a certain percent.[38] However, "percentage reduced" figures do not give the public a realistic understanding of the tremendous quantity of mercury used at these factories and released to the environment.

Despite reductions in mercury emissions, huge quantities are still being emitted even though current technology can completely eliminate this pollution. In 2006 for example, the most recent year that public information is available on mercury emissions from the Foul Four, the four factories needlessly emitted over a ton of mercury into the air.[40] Considering that 0.3 grams of mercury can, over time, contaminate a 25-acre lake,[41] this ton of mercury represents a major assault on the environment.

At any given time, the Foul Four could each have 200 to 300 tons of mercury on-site.[39] Even if the Foul Four keep track of 99.9 percent of their mercury, but lose one-tenth of one percent of it to the environment, it could still mean the release of about 1,600 pounds of mercury annually — this figure is actually slightly less than their most recently reported cumulative emissions.

By providing information in "percent reductions" terms, the Foul Four are leading the public to believe that emissions are not currently high, and obscuring the fact that there is a viable alternative to this type of pollution.

## *"High Grade Caustic Soda" Can Be Mercury-Free*

The Foul Four do not need to use mercury to produce a special "mercury grade" caustic soda. Mercury-based chlor-alkali technology does create a lower-salt caustic product than mercury-free technology.[42] However, rayon production, a primary industry that once required such low-salt caustic, ceased to exist in the United States in 2005.[43] Furthermore, mercury-free facilities elsewhere

in the world have created caustic with low enough salt content to be used in rayon production.[44] Additionally, caustic created using mercury often is contaminated with mercury, and many industries will not use it because of this contamination.[45] As a result, the suggestion that these plants must continue to use mercury to make a certain grade of product proves to be a bad excuse for sticking with outdated technology.

***Olin Corporation could have eliminated mercury use at its Georgia plant for the amount of money spent on reducing mercury at its two facilities.***

## *Money Spent to Reduce Mercury Could Have Been Better Spent*

Plant managers at the Foul Four also like to tout the tens of millions of dollars they have spent to keep up with environmental regulations concerning mercury pollution.[46] The fact that the Foul Four have to spend such tremendous amounts of money to achieve such minimal mercury reductions should raise eyebrows among shareholders, not to mention local residents. First, the Foul Four are spending money to control mercury, when their competitors do not have to. This makes it harder to compete. Second, they are repeatedly spending money to make minor reductions when the same capital could be invested in switching, which would alleviate the need for future expenditures on mercury regulations.

For example, Olin Corporation boasts that it has spent $54 million at its Tennessee plant and $48 million at its Georgia facility over the past eight years to keep up with mercury regulations.[47] Those two sums together could have easily paid for the complete conversion of Olin Corporation's Georgia factory.[48] Switching to mercury-free technology could save money by eliminating costs associated with mercury recordkeeping, monitoring and maintenance that would pay dividends in the future.

## *The Majority of the Costs of Switching Can Be Recovered Within Five Years*

One of the largest expenses for chlorine factories is the vast amount of electricity needed for the electrolysis process. In fact, mercury-cells are the most energy intensive of the chlorine production processes; meanwhile, mercury-free chlorine production is up to 37 percent more energy efficient.[49] It has been estimated that the Foul Four each spend between $5 million and $32 million annually on electricity alone;[50] therefore, even energy savings of 25 percent annually would equal millions of dollars in savings. If the Foul Four decided to switch to mercury-free technology, they could also increase their chlorine capacity — just as many of their competitors already have. Together, the energy savings, the eliminated cost of handling hazardous mercury and the increased capacity add up to enough to pay for the majority of a conversion within five years. At least four factories, including a PPG Industries and an Olin Corporation

plant, have received, or are expecting to receive, a complete return on their investment in mercury-free technology in five years or less.[51] By switching to this newer technology, the factories could save millions of dollars annually.

***If these companies were interested in being good corporate citizens, they would be announcing their plans to switch to mercury-free technology to protect local jobs and the environment, rather than continuing to make excuses.***

## Conclusion

The Foul Four may prefer not to discuss their future plans with the communities in which they operate. However, if they do not share information about the long term viability of their factories and the plants close, employees may only have a limited time to find new job opportunities.[52] This analysis of the chlor-alkali industry has demonstrated that the economic life of mercury-cells is approximately 50 years and ERCO Worldwide's story reinforces that fact. Therefore, the Foul Four are likely to reach the end of their economic lives within four to seven years. Shifting the last four mercury-based chlorine factories to mercury-free technology would save nearly 500 jobs while also eliminating more than a ton of mercury releases from the environment annually. Conversion to the new process can be done quickly with minimal down-time, while creating hundreds of jobs locally. None of the excuses given by these companies stand up when considered in light of the experiences of their competitors. As a result, it seems clear that if these companies were interested in being good corporate citizens, they would be announcing their plans to switch to mercury-free technology to protect local jobs and the environment, rather than continuing to make excuses.

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