

AkzoNobel Industrial Chemicals

Your Chlorine



AkzoNobel

Tomorrow's Answers Today



An evolving consumer-led market



Markets are constantly on the move. But change is not something to fear. On the contrary, it brings new opportunities. With more than a century of experience as the largest chlorine merchant in Europe, we thrive on change. We live in exciting times. New technology is opening up new horizons that were beyond our imagination a few years ago. The relationship between society and industry is also changing.

In an interconnected world people are reconsidering their perception of risks and increasingly desire sustainable solutions that provide comfort for today without compromising the future. In the face of all these changes we see an exciting new dynamic taking shape in the mid-size chlorine market. New technologies now make it possible to safely and economically operate mid-size plants remotely.

For the industry one thing is certain, the spotlight is going to be on the risks inherent in transporting potentially harmful chemicals through or close to residential areas. Irrespective of whether these fears are founded or not, it's a public perception we and our customers will have to take on board if we are to maintain our reputation as leaders in the industry. Does that mean the transport of chlorine by road or rail will be phased out soon? Not immediately, but forewarned is forearmed.

Let's take a look at what we believe are the key drivers in the merchant chlorine markets:

- **Perception.** Even though technically safe, the transportation of chlorine by road or rail is facing increasing headwind fuelled by public and government concerns about perceived risks.
- **Conversion to membrane technology.** Chlor-Alkali producers converting mercury-based technology to membrane production process will optimize their capacity in order to remain economically viable, which might limit the future sourcing options for transported chlorine.
- **Supply disruptions.** Mid-sized chlorine users will become increasingly sensitive and vulnerable to supply disruptions due to labor issues and logistical risks (delays, contamination, etc).



A radical rethink of the chlorine supply chain

Against this backdrop, AkzoNobel has thought long and hard about how to secure the supply of chlorine to customers. Instead of high profile transports, we have focused on delivering chlorine at source where it is needed. Our future-proof, full service solution is Your Chlorine. These chlorine production units, located at our customers' manufacturing sites and remotely controlled by specialized AkzoNobel personnel, offer customers a sustainable chlorine supply.

The concept offers the ideal solution for businesses which depend on a steady supply of chlorine in intermediate volumes, offering advantages enjoyed by large-scale chlorine consumers that are supplied via pipeline. So you can forget about the uncertainty of having to buy chlorine in the market. But that's not all, Your Chlorine offers customers the possibility to replace existing smaller plants still using the outdated, environmentally disputable mercury electrolysis process. Our small-scale production units offer an economically viable way to convert aging facilities to state-of-the-art membrane technology.

Benefitting from our chlorine expertise

Your Chlorine brings the wealth of AkzoNobel's industrial scale chlorine expertise to your site:

- The units will be operated to our exacting operations standards and controlled by our expert personnel
- The safety profile of your site will be enhanced, because the volumes of chlorine that need to be stored on site will be reduced
- You no longer have to worry about logistics. We'll handle raw materials as well as by-products
- Enjoy security of supply. We guarantee a continuous flow of chlorine for your production.

In a nutshell, Your Chlorine offers an efficient, safe and cost-effective on-site solution for customers' chlorine requirements. By reinventing the supply chain, AkzoNobel enhances your continuity of supply.

Helping you realize your strategy

As we seek a new way forward for our industry, we're not just looking for customers to join us, but partners. New ideas can only work if they are based on a solid technical foundation. Then you need determination and passion to see them through. We've got all three in abundance. Of course, a radical new idea will only work if it's practical. It needs to fit your situation. We're constantly speaking to our customers about how we can optimize our service to them and build in greater security guarantees.

Many customers have told us they

- Experience constraints or risks in their current chlorine supply situation
- Would like to stay in control and proactively prepare for the transition in the market by creating a stable, durable solution
- Are looking for a combined business, financial and technical solution
- And last but not least, share our vision about a sustainable chlorine supply.

So why not think about an alternative that's safe, secure and future-proof?


Developing your business

We understand that switching to something completely new demands discussion, evaluation, good planning, but also a lot of trust, know-how, and cooperation. Every journey starts with the first step. If you're interested in Your Chlorine, we'd like to invite you to work with our business development team to find a solution that fits your needs. By including you in the planning process, we want to make sure there won't be any nasty surprises along the way.

We offer you:

- Business structures that create the required levels of transparency and strategic security to accommodate the dynamic business environment
- Risk/Reward sharing financial solutions that create win-win situations
- Appropriate technical solutions which deliver all the benefits of AkzoNobel's operational experience in a robust, standardized package
- A package that is flexible enough to be customized to the local needs of our partners.

Once we've come to an arrangement we're both happy with we'll complete the transition process as fast and seamlessly as possible. And working with you as strategic partner, you can be assured your interests will be safe with us. AkzoNobel Industrial Chemicals. A partner to rely upon in a changing world.



Are you ready to join us in re-inventing the chlorine supply chain?

Customer Deliverables



Your Chlorine – customer benefits throughout the supply chain

Before you decide to adopt an entirely new approach to chlorine supply, you'll first need to be absolutely sure Your Chlorine will deliver added value throughout your business. Each of the disciplines below must meet a number of criteria if they are to be successful. We believe Your Chlorine delivers across-the-board benefits that will help you position your business for the future by offering the following:



Business management

- Guaranteed continuity of chlorine supply
- Sustainable solution as an alternative to chlorine transport
- Independence in an evolving market
- Future-proof technology
- Financial and business structures that create win-win situations
- AkzoNobel takes care of remaining caustic soda to the benefit of the partnership



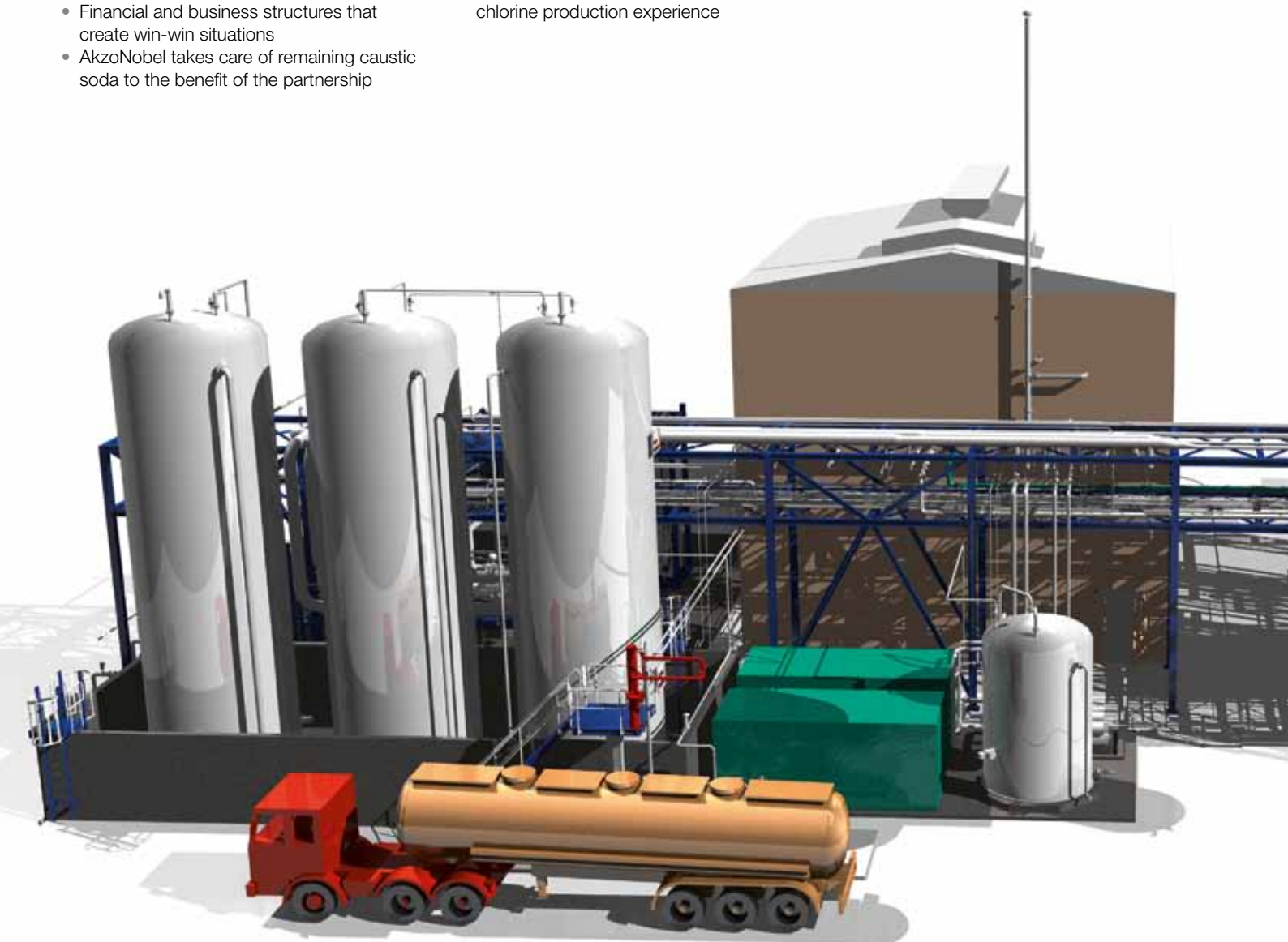
Site management

- Improved working environment
- Lower chlorine inventory on-site
- Full service – construction, operation, maintenance, and logistics
- AkzoNobel: more than 100 years of chlorine production experience



Production management

- Excellent availability and reliable quality
- Supplied directly via pipeline
- Fully automated, remote 24/7 control





HSE management

- Excellent safety management
- Lower volume chlorine storage
- Eliminates high-risk chlorine handling activities such as unloading of RTCs or trucks
- Efficient permit process



Maintenance management

- Safety first
- Great reliability: designed with proactive maintenance philosophy
- Optimal efficiencies by Plug & Play



I love the idea of Your Chlorine, **but what about ...?**

So, you're interested in principle, but there are a couple of nagging concerns. If you recognize any of them below, then we should talk.

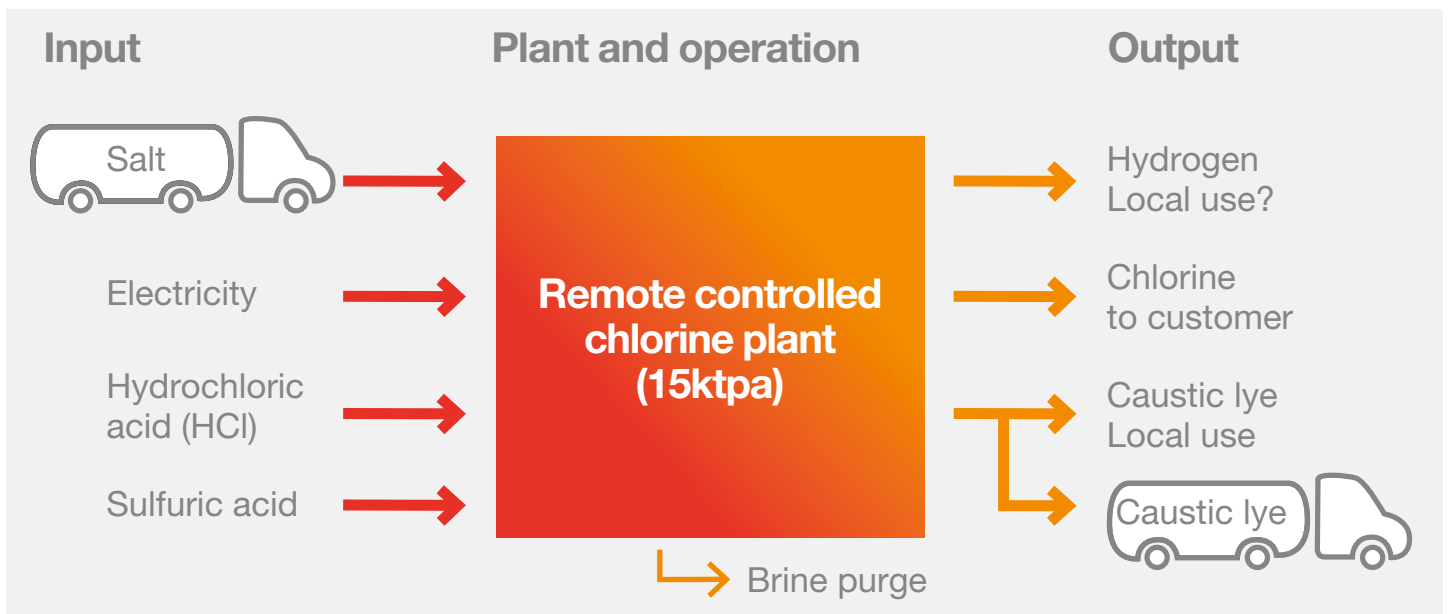
"We are aware that there are changes in the chlorine supply market, and we experience problems in our security of supply, but we do not want to be responsible for producing chlorine at our site. That's not our business."

"We like the operational control, safety and security that would be offered by on-site chlorine production, but we don't want to be bothered with the financial risks and lost opportunities that are certainly involved with switching."

"An on-site Chlorine solution sounds like a durable, long-term supply solution. However, how do we make sure that we maintain the business flexibility that reflects the dynamics of the market?"

Your Chlorine Facts & Figures:

Complete chlor-alkali plant
 Membrane electrolysis technology
 Up to 15,000 tons of chlorine per year
 Module based and skid mounted
 Safe and contained
 Generic footprint: 74x56 meters
 Remotely operated by AkzoNobel
 High reliability
 Designed and engineered by AkzoNobel, Uhde and UHDENORA



Responsibility of AkzoNobel

The full service solution includes:

- Design and detailed engineering on-site
- Construction, commissioning and start up of plant
- Data, analysis and documentation for permit application
- Operation of the unit
- Supply of raw materials and utilities
- Maintenance
- Bringing the co-product caustic soda lye to the market to the benefit of the partnership
- Investment

Akzo Nobel Industrial Chemicals B.V.

Stationsstraat 77
P.O. Box 247
3800 AE Amersfoort
The Netherlands
Email: yourchlorine@akzonobel.com

Industrial Chemicals produces and markets salt and energy, chlor-alkali products and derivatives like monochloroacetic acid (MCA), chloromethanes and metal salts. Our products are essential for daily life and are used in the manufacture of, among others, vehicles, construction materials, glass, performance plastics, pharmaceuticals and textiles, and in disinfectants for swimming pools.

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AkzoNobel is the largest global paints and coatings company and a major producer of specialty chemicals. We supply industries and consumers worldwide with innovative products and are passionate about developing sustainable answers for our customers. Our portfolio includes well known brands such as Dulux, Sikkens, International and Eka. Headquartered in Amsterdam, the Netherlands, we are a Global Fortune 500 company and are consistently ranked as one of the leaders in the area of sustainability. With operations in more than 80 countries, our 55,000 people around the world are committed to excellence and delivering Tomorrow's Answers Today™.

