Sustainability Progress Report

September 2020

WORLD chlorine council®

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Introduction to the World Chlorine Council (WCC)

The World Chlorine Council (WCC) is a global network of national and regional trade associations and their member companies representing the chlorine and chlorinated products industries. Formed in 1993, WCC features participation from chlor-alkali producers across China, Europe, India, Japan, Latin America, North America, Russia, and South Korea, and works to include all global manufacturers. WCC represents 85% of the world chlorine capacity and its mission is to be a global forum to promote health, safety, and environmental best practices to provide society with the benefits of the chlor-alkali industry. WCC is accredited as a non-governmental organisation by the United Nations (UN) General Assembly and is a recognised major stakeholder that can provide input into the UN system on priority international issues.

WCC's Vision and Goals

Vision | Chlor-alkali chemistry is recognised as making an essential contribution to a sustainable world.

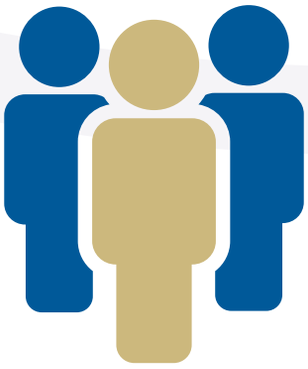
Safety | Promote the continuous improvement of safety, environment and health performance, progress and practices worldwide in chlor-alkali production, transportation and use.

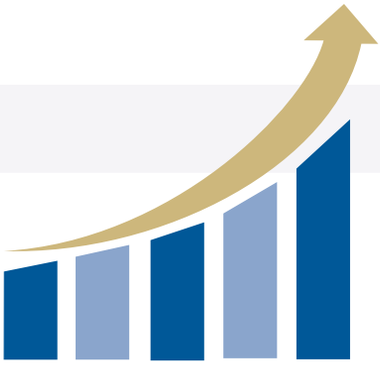
Active engagement | Maintain active engagement with our partners to share our knowledge, insights and perspectives.

Sustainability | Demonstrate and communicate the environmental, social, and economic contributions of chlor-alkali chemistry.

Advocacy | Participate in key international, regulatory and policy fora to promote informed decision making by World Chlorine Council member organisations and key stakeholders.

Communications | Communicate the opportunities, progress, and challenges facing chlor-alkali chemistry to our members and society.





Progress on Sustainability | WCC's Perspective

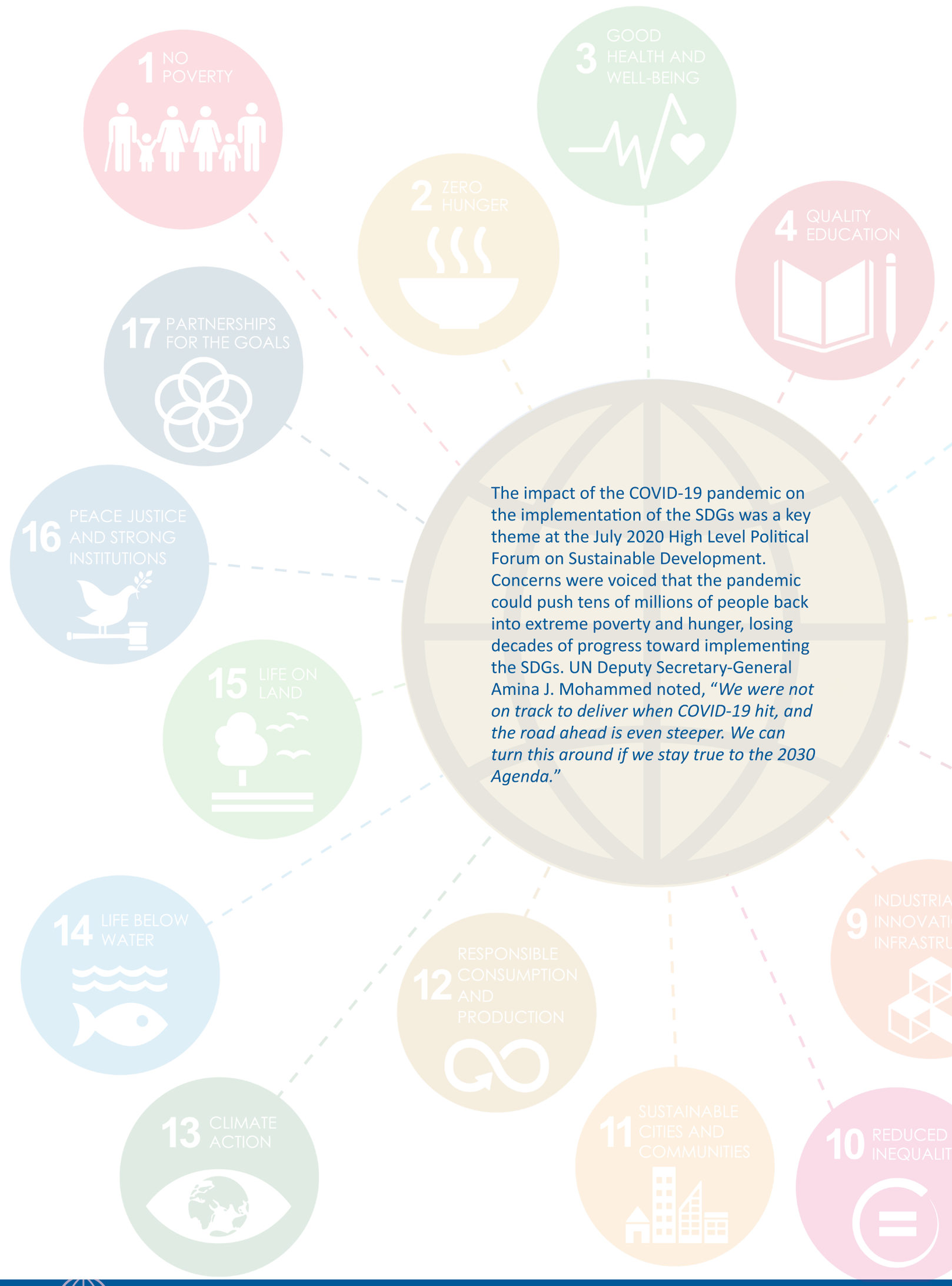
The chlor-alkali industry's dedication to continuous social, economic and environmental improvement - known as the **triple bottom line** of sustainability - guides its activities.

Society | Pertaining to the social component, but also related to the economic and environmental components, WCC organises 'Water Forums' in countries seeking to improve the availability of safe drinking water and proper sanitation. The Water Forums are held every few years and bring together renowned speakers that are experts in their field, and decision makers that can help bring clean water and sanitation services to communities. In addition, WCC members have ongoing water-related programmes and philanthropic initiatives, and are engaged with their local and regional stakeholders.

Economic growth | The economic component of sustainability is also an important factor, as economic growth is critical to solving both environmental and social challenges, including poverty reduction. The global chemical industry has a critical role to play as both an employer in chemical manufacturing operations, and enabling economic activity via products that support a range of industries including agriculture and healthcare. Moreover, chemistry is essential in enabling economic activity through innovation. Virtually all manufactured products are touched by chemistry, especially chlor-alkali chemistry, and without chemistry, many new technologies would never be possible. In addition, sharing best practices to enhance safety, and protect our environment and employees, is a top priority. WCC members are continuously optimising their operations to help minimise emissions, reduce waste, and improve safety during the manufacture and transport of chlor-alkali products.

Environment | Chlorine chemistry helps improve the environment. It has a role to play in protecting marine life from invasive species, reducing habitat loss from agriculture, providing renewable energy, and minimising the impact of wastewater discharge, among other beneficial environmental applications.

As the world increasingly seeks sustainable solutions to pressing problems, WCC is pleased to present its fourth triennial report of the chlor-alkali sector's achievements and contributions.



The impact of the COVID-19 pandemic on the implementation of the SDGs was a key theme at the July 2020 High Level Political Forum on Sustainable Development. Concerns were voiced that the pandemic could push tens of millions of people back into extreme poverty and hunger, losing decades of progress toward implementing the SDGs. UN Deputy Secretary-General Amina J. Mohammed noted, "*We were not on track to deliver when COVID-19 hit, and the road ahead is even steeper. We can turn this around if we stay true to the 2030 Agenda.*"

How chlorine chemistry supports the UN SDGs

In 2015, the United Nations (UN) announced **17 Sustainable Development Goals (SDGs)** to achieve by 2030. Attaining these goals is no easy task and requires thoughtful solutions to be deployed by a multitude of stakeholders working across borders.

One of these solutions is chlorine – an abundant building block element well known as a public health staple used to disinfect drinking water. Chlorine also has a lesser known but critical role in making many products that we benefit from daily. Often referred to as chlorine chemistry, it is a key component to help achieve many of the 17 SDGs.

WCC has participated in UN global conferences on sustainable development from our early days. A WCC delegation attended and addressed the 2002 World Summit on Sustainable Development ("Rio+10") in South Africa. Ten years later in 2012, WCC participated in the UN Conference on Sustainable Development ("Rio+20") in Rio de Janeiro. At that time, the world community was focused on achieving the eight Millennium Development Goals, which had been adopted by the UN General Assembly in September 2000. These included halving - by 2015 - the proportion of the world population that in 1990 lacked sustainable access to safe drinking water (achieved five years early in 2010) and basic sanitation (not achieved by 2015). WCC promoted the role of chlorine chemistry in helping to reach those goals.

WCC participation in global sustainable development continued as the UN General Assembly adopted the 2030 Agenda on Sustainable Development in September 2015, when the 17 SDGs were unveiled. As a registered observer under the UN Economic and Social Council, WCC attended several UN General Assembly Open Working Group meetings on setting the water and sanitation goal and associated targets. WCC submitted a statement to the UN on the role of drinking water chlorination in helping to achieve global access to safely managed drinking water. In July 2018, WCC exhibited at the UN High Level Political Forum on Sustainable Development in New York City with safe water partners, highlighting the multiple and diverse SDGs that chlorine chemistry will help achieve by 2030.

This report provides some examples of how chlorine chemistry is helping to meet current and future global sustainable development challenges.

Providing safe drinking water

Chlorine plays an especially critical role in making water safe to drink, disinfecting wastewater, and as a component of water infrastructure through PVC pipes. Chlorine disinfection of drinking water can be used at the individual household level or scaled up to a large municipal drinking water facility. The versatility of the scale in which chlorine disinfection can be applied to drinking water makes it a particularly powerful tool to help achieve SDG 6.

Chlorine's unique abilities to make water safe to drink is essential to attaining SDG 6. According to the World Health Organization and the UN Children's Fund Joint Monitoring Programme Report in 2019, 785 million people lack even basic drinking water service and 2 billion people use a drinking water source contaminated with faeces. Contaminated drinking water is estimated to cause 485,000 diarrhoeal deaths each year.[1]

In an effort to improve access to safe drinking water, the WCC has partnered with organisations all over the globe. Provided in more detail below, WCC holds Water Forums that bring together experts to help find solutions to achieve SDG 6. Additionally, WCC has created posters to inform those with water cisterns on proper ways to maintain them so they safely contain drinking water for households. Lastly, WCC members aid philanthropic organisations working on the ground providing access to clean drinking water in developing communities in Haiti and Honduras.

WCC's website has additional drinking water resources available at **https://worldchlorine.org/publications/.**

[1] https://www.who.int/news-room/fact-sheets/detail/drinking-water

The African Water Forum, 25 July 2019, Johannesburg, South Africa

In 2019, WCC organised the African Water Forum in Johannesburg, South Africa, a region where water scarcity made headlines around the world. At the forum, a team of international experts instructed the audience on water related topics. These included how chlorine is essential in improving the health of 1.8 billion people worldwide who still drink contaminated water and the role of chlorine in achieving the UN SDGs. The experts assembled gave presentations on supplying clean water at household, community and city scales, and how human behaviour impacts policy and individual decision making in obtaining clean drinking water. The African Water Forum was chaired by Deidre Penfold of the Chemical and Allied Industry Association (CAIA) who noted "The experts have provided us with a lot of excellent information. As part of our Responsible Care® work, it is encouraging to see how people at all levels are contributing to the UN SDGs. The expert advice from this event will help to further develop South Africa's input to these important goals".

This was preceded by a site visit to the Rietvlei Water Treatment Plant, where participants learned how chlorine can be safely applied to disinfect drinking water to protect people around the world from water-borne illness. Of interest to attendees were the challenges faced in supplying both high quality and sufficient quantities of water.

Developed Infographic Posters explaining how to use chlorine chemistry to disinfect cisterns

In collaboration with the Water Engineers for the Americas, WCC released a set of new, informative posters on how to disinfect cisterns using chlorine chemistry.

In many parts of the world, individual homes store collected drinking water in large tanks or cisterns. In order to keep these tanks clean and the household protected from water-borne illnesses, these tanks need to be regularly cleaned and disinfected. This helps to get rid of any potentially harmful bacteria or viruses that are growing within. Here, chlorine chemistry is vital due to the excellent and proven disinfectant properties of chlorine-based disinfectants in addition to their affordability and applicability across a wide range of cistern sizes.

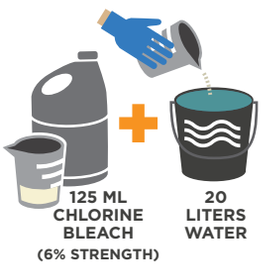
The posters explain via simple diagrams how to safely and effectively disinfect cisterns. It is hoped that these posters can be used to help safeguard the health of people in developing communities across the globe.

CLEAN & DISINFECT WITH SODIUM HYPOCHLORITE BLEACH

WATER CISTERNS METRIC UNITS

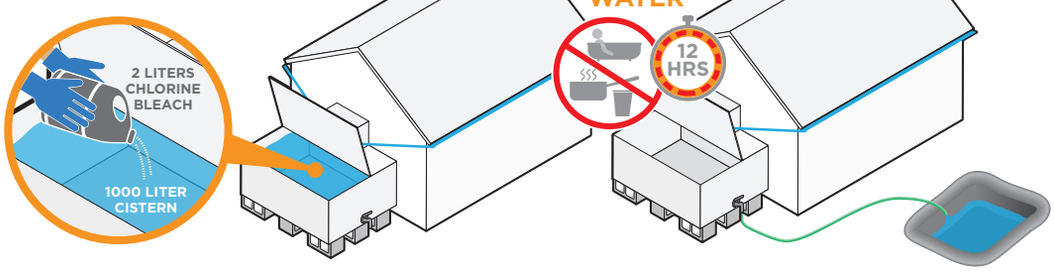
1 CLEAR ROOF & GUTTERS AND EMPTY CISTERN

2 MAKE DISINFECTING SOLUTION



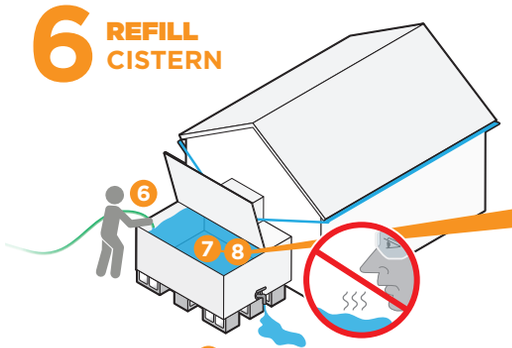
3 USE DISINFECTING SOLUTION TO SCRUB CISTERN. RINSE WITH PLAIN WATER.

4 FILL CISTERN WITH WATER AND CHLORINE BLEACH. LET SIT FOR 12 HOURS.



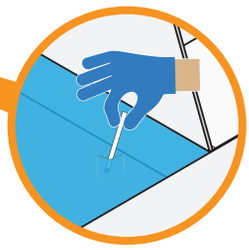
5 EMPTY CISTERN

6 REFILL CISTERN



7 ADD A CHLORINE RESIDUAL

8 MONITOR TO ENSURE A CHLORINE RESIDUAL



6 RUN UNTIL NO BLEACH SMELL FROM WATER RUNNING OUT. FILL CISTERN.

WORLD chlorine council®

download at **www.worldchlorine.org/publications/**

2020

Ensuring adequate and healthy food

Chlorine chemistry improves food supply, reduces food waste, and contributes to food safety. In addition to crop protection compounds that improve agricultural yields, chlorine chemistry helps keep food safe and fresh for longer. Products such as sodium hypochlorite bleach are used to sanitise and disinfect food contact surfaces and equipment. Chlorine chemistry is also used to make certain types of food packaging that can help extend the shelf life of food and prevent spoilage and contamination.


2 ZERO HUNGER

Supporting health care

Chlorine chemistry is used in the manufacture of many critical pharmaceuticals and healthcare products. Also, surface disinfection using chlorine-based products reduces the spread of infectious diseases.

Many pharmaceuticals are made possible by chlorine chemistry either as part of the synthesis of pharmaceuticals, or present in final compounds. These include medicines to treat HIV/ AIDS, allergies, arthritis, cancer, depression, diabetes, heart disease, hypertension, infections, pneumonia, ulcers, and more.

Further, an estimated one-quarter of medical devices and equipment depend on chlorine chemistry. Chlorine-based plastics are used to manufacture intravenous drips and blood bags, sterile tubing, prosthetics and heart catheters. Chlorine helps make polycarbonate face shields that protect healthcare workers, and even semi-conductors for diagnostic medical instruments are made using chlorine chemistry.

Chlorine chemistry is also helping in the fight against mosquito-borne diseases, such as Zika virus, malaria, and dengue. Mosquito-borne diseases cause millions of deaths globally every year. From anti-mosquito sprays, placing chlorine disinfectants in areas that collect water, to special impregnated sleeping nets, chlorine chemistry is essential to protect against diseases caused by biting insects.

In hospitals, schools, day cares, nursing homes, and elsewhere, chlorine-based disinfectants such as bleach help protect people from infection by inactivating pathogens on surfaces. This is especially important in healthcare settings where there is an increased risk of spreading pathogens among patients.

WCC member Abiclor launched new campaign in fight against mosquito-borne diseases

In 2019, the number of cases of the tropical disease known as Dengue fever increased by almost 600% in Brazil. This potentially life-threatening illness can be spread by the Aedes aegypti mosquito, whose larvae thrive in stagnant, untreated water.

Fortunately, chlorine chemistry is helping to prevent the spread of these mosquitos. Sodium hypochlorite (or bleach) is very effective in destroying the larvae of Aedes aegypti. This vital chemical is also useful against the mosquito that spreads chikungunya and Zika diseases.

Abiclor, the Brazilian chlor-alkali and derivatives industry association, launched a campaign in June 2016 to focus on Dengue fever caused by the Aedes aegypti mosquito and the role chlorine chemistry plays in this battle. It published four videos in Portuguese and Spanish that show tips on how to prevent the mosquitos from breeding. The videos focused on how to take care of plants, pools, water tanks, drains and toilets which, if untreated, can also be environments conducive to mosquito growth.

This is the fourth year of work by Abiclor on this initiative. Through the Latin America Association for the Chlor-Alkali and Derivatives Industry (CLOROSUR), there are plans to extend the project into other parts of Latin America, such as the Caribbean, Mexico, Nicaragua, Colombia and Honduras, as they also have many cases of dengue every year, according to the Pan American Health Organisation. Higher temperatures and increases in heavy rains recorded in the region have accelerated the spread of mosquito-borne diseases in Latin America.

This work is very timely as by October 2019, more than 2.7 million cases of dengue had been reported in the region with over 1200 deaths. This is 13% higher than in 2015, when the previous outbreak of dengue occurred. Chlorine chemistry is playing a vital role in the fight against mosquito-borne diseases. The campaign includes **four podcasts** about the history of mosquito/virus, preventive measures, the importance of chlorine and its scientific evidence. The podcasts were published on **Spotify** and **Apple streaming**.

The fight against COVID-19 has a new ally… chlorine chemistry!

Chlorine chemistry has a vital role to play in controlling viral outbreaks, such as that of COVID-19, across the globe. COVID-19, first identified in Wuhan, Hubei Province, China, was declared a pandemic by the World Health Organization (WHO) in March 2020. The US Centers for Disease Control and Prevention (CDC) issued guidance to help prevent the spread of the virus through surface disinfection.

To inform people on how to disinfect surfaces for SARS-CoV-2 (the virus that causes COVID-19 infection), the American Chemistry Council's Chlorine Chemistry Division developed a pictogram poster on cleaning and disinfecting surfaces. The poster is based on CDC guidance.

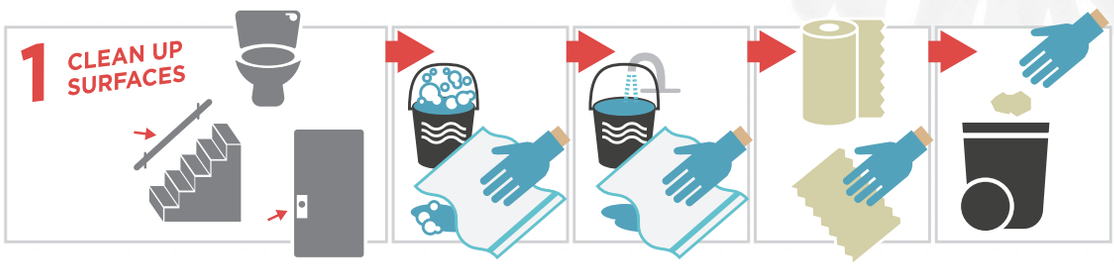
In addition, during the pandemic, chlor-alkali producers from around the world provided products made using chlorine chemistry to help in the fight against the virus. These include medical equipment such as polycarbonate face shields and sterile PVC tubing.

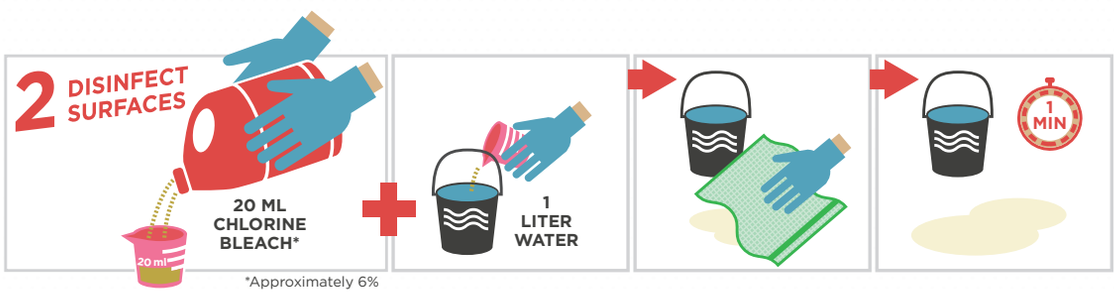
METRIC UNITS

Help Prevent the Spread of COVID-19* ("novel coronavirus")

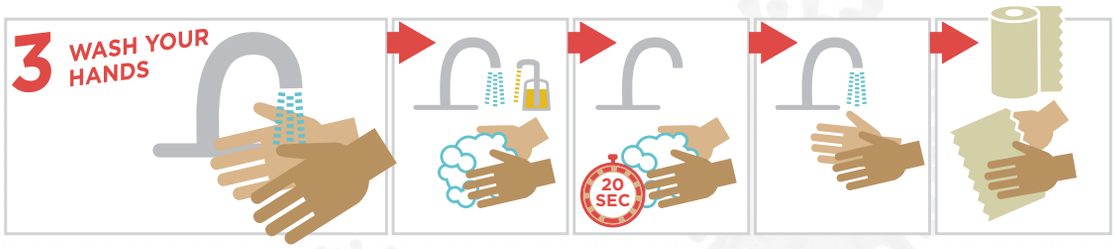
WARNING MIX BLEACH WITH WATER ONLY WARNING

Clean surfaces that are touched a lot.





*Approximately 6%



Always read and follow manufacturer's directions.

***COVID-19 is caused by the SARS-CoV-2 virus**

For more information on COVID-19 prevention, please see https://www.cdc.gov/coronavirus/2019-ncov/index.html.

Posters are available for download at **www.waterandhealth.org/resources/posters**

National Environmental Health Association

Water Quality & Health Council

American Chemistry Council

Creating renewable energy

Chlorine chemistry is a building block in the manufacture of key ingredients in solar panels, wind turbines, and hybrid car batteries.

In solar panels, chlorine chemistry is used to help purify the silicon found in grains of sand that is used to make solar panel chips. Wind turbine blades are often made from chlorine-based epoxy resins.

Clean, energy-efficient hybrid vehicles contain electric motors powered by nickel metal hydride battery packs; these batteries, which last longer than the most advanced lead-acid battery, use potassium hydroxide, a co-product of chlor-alkali production, as an electrolyte. Hydrogen, a valuable co-product of the chlor-alkali process, is used as a fuel in buses and cars, promoting a cleaner living environment in cities.

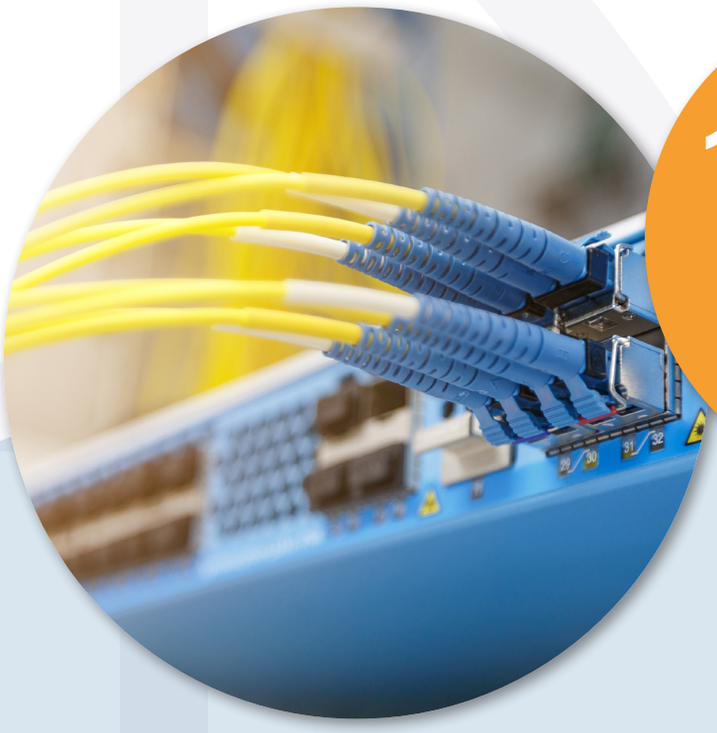
Chlorine Chemistry Helps Improve Solar Power Efficiency

In addition to chlorine chemistry being used to purify silicon to make solar panels, it also facilitates the production of titanium dioxide (TiO_2). Titanium dioxide is driving advances in solar power generation through efficiency improvements. Researchers have found that heat transfer in solar power plants could be made dramatically more efficient using nanofluids made with TiO_2, reports **Phys.org**. A recent paper in the **Renewable Energy** journal describes a way to improve the efficiency of this heat transfer by adding tiny particles of titanium dioxide. Known as nanoparticles, these increase the amount of electricity generated from solar plants. In the research, the ability of the heat-transfer material to conduct heat rose by almost 53%, and the efficiency of the nanofluids improved by up to 35%.

Building sustainable cities and communities

Chlorine chemistry helps achieve sustainable cities and communities with affordable and durable housing materials, and telecommunications and computer technology.

Polyurethane foam insulation, advanced refrigerants, and PVC based window frames, manufactured using chlorine chemistry, increase the performance of home heating and air conditioning systems. PVC water pipes are extremely durable and versatile. They can be used in the home or to carry drinking and waste water throughout cities. Fiber optic cables and computer chips, that use chlorine chemistry to make the glass and silicon wafer components, help make cities ‘smart’ by communicating residents’ movement to optimise transit systems.



11 SUSTAINABLE CITIES AND COMMUNITIES

Chlorine Chemistry: Key to India's Smart Cities Mission

In 2015, India announced the Smart Cities Mission. The objective of the **Smart Cities Mission** is to upgrade 100 existing cities or build new Smart Cities in India. These cities are to provide core infrastructure, a higher quality of life to residents, and a clean and sustainable environment through the application of sustainable solutions based on inclusive development.

To achieve the Smart Cities Mission, the country aims to enhance physical infrastructure, such as reliable clean water, electricity supply, sanitation, solid waste management, public transport, IT connectivity, citizen safety, as well as provide social facilities such as health, education, and recreational facilities. Additionally, technology solutions will be applied for electronic services delivery, waste to compost/energy, treatment/recycling of wastewater, renewable energy, green buildings, intelligent traffic management, and parking, among other issues faced by cities. The Indian government clearly defined what they meant by "Smart." Over half of the 11 objectives were environmental and main components of the metabolism of a city.

Chlorine chemistry will play a vital role in accomplishing India's Smart Cities Mission. Products of the chlor-alkali manufacturing process, **chlorine** and **sodium hydroxide**, are essential to manufacturing PVC pipes that transport water, energy-saving vinyl windows, fiber optic cables and computer chips for IT infrastructure, solar power panels that generate electricity, "pickled" steel used in construction and electricity distribution, treated water, and many other products.

While India strives to enhance the livability and sustainability of its cities, chlorine chemistry will continue to be a key element to attain the goals of the Smart Cities Mission.

Responsibly and safely producing more using less

Chlorine chemistry fosters responsible consumption and production of products made by other industries that reduce feedstock inputs and minimise waste.

For example, aluminium beverage cans are recycled by bubbling chlorine gas through molten aluminium scrap to reduce impurities for reuse. In addition, using chlorine chemistry to manufacture titanium and titanium dioxide results in less waste compared to other chemical processes to make these products. This conserves resources, reduces waste, and contributes to a circular economy.

The global chlor-alkali industry itself is also reducing its footprint by moving towards more efficient technologies in the chlor-alkali manufacturing process that reduce emissions and consume less energy. In addition, the chlor-alkali industry is committed to safe management of substances throughout their lifecycle. WCC not only focuses on safe production, but also on open communication with stakeholders about chemicals management, and on good product stewardship according to the standards of Responsible Care® and the International Council of Chemical Associations' (ICCA) Global Product Strategy (GPS):

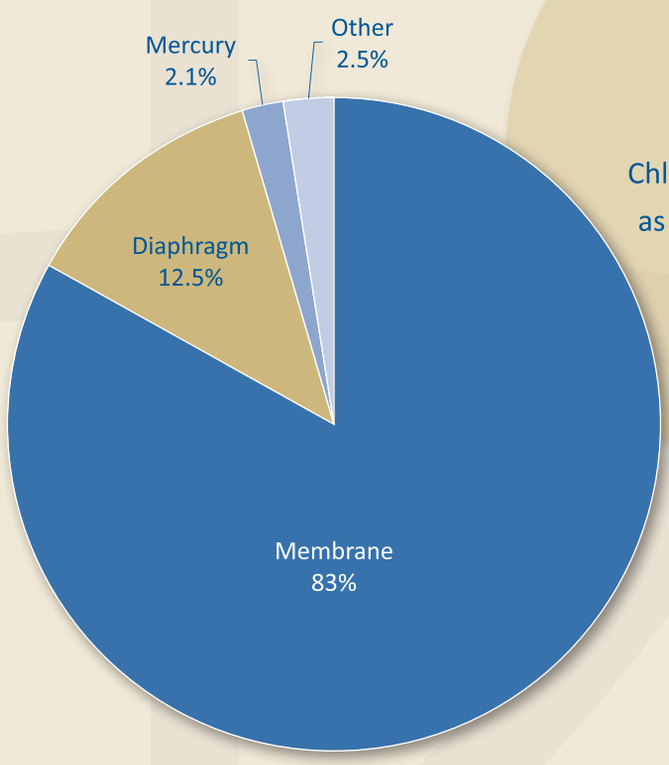
- **Responsible Care®** is the chemical industry's unique global initiative that promotes continuous improvement in health, safety and environmental performance, together with open and transparent communication with stakeholders. It includes a tracking and reporting element that allows identification of the areas that require special attention. Responsible Care® has fostered the development of the ICCA GPS.
- The **ICCA Global Product Strategy** seeks to improve the industry's management of chemicals including the communication of chemical risks throughout the supply chain. GPS advocates for harmonising safety assessments at the global level to evaluate and provide guidance on safety and risk management for chemicals in commerce.

12 RESPONSIBLE CONSUMPTION AND PRODUCTION

How is WCC contributing?

WCC closely monitors and supports the global efforts of the chlor-alkali sector to transition from the mercury cell process to newer production technologies under sound business management approaches, consistent with the requirements of the Minamata Convention on Mercury.

In first instance, this is done through **comprehensive data collection**.



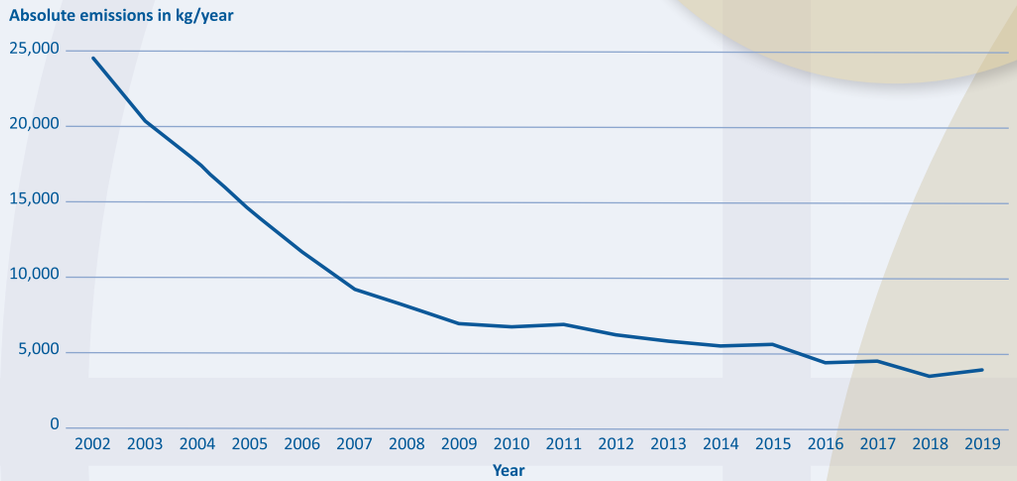
Use of the different technologies worldwide

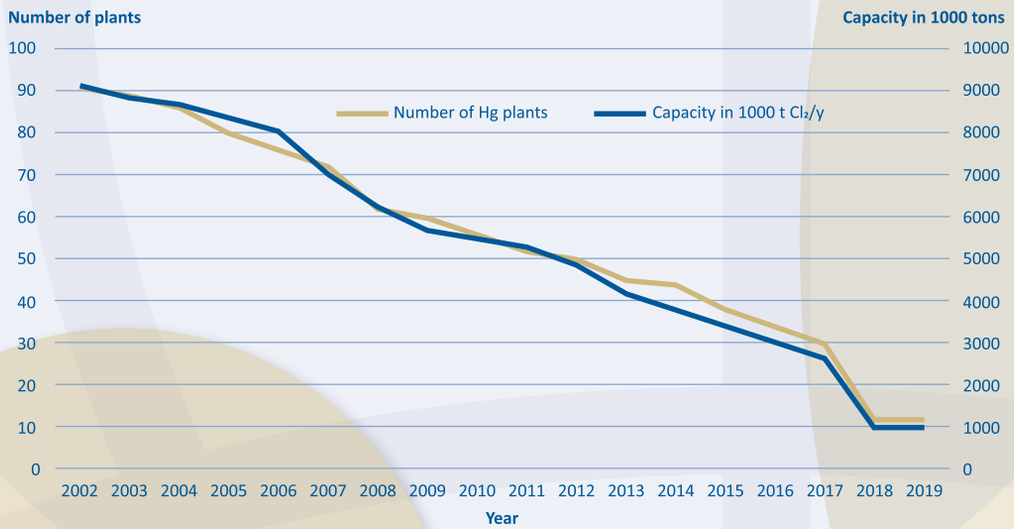
Chlorine production technology as % of total installed capacity (88,902 kt in 2018)

12 RESPONSIBLE CONSUMPTION AND PRODUCTION

Mercury emissions across the globe

Total mercury emissions (air + water + products) for USA/Canada, Europe, India, Brazil/Argentina/Uruguay and Russian plants (from 2005 onwards)
Total emissions kg Hg /y





Evolution of the worldwide chlor-alkali capacity based on mercury

Number of plants and capacity of mercury electrolysis units in USA/ Canada/Mexico, Europe, Russia, India, Brazil, Argentina and Uruguay

Secondly, WCC puts great effort in **maintaining open and transparent dialogues** with the UN and other stakeholders:

- As a UN-recognised Non-Government Organisation, WCC engaged early in both regional and global initiatives to address mercury releases to the environment, including the UN Environment Program's (UNEP) Minamata Convention on Mercury.

- At several regional and international fora, WCC shares its findings:
  - The WCC membership recognises that mercury is a chemical of global concern; industry is moving to mercury-free technologies as existing facilities reach the end of their economic lives. The chlor-alkali sector has already achieved an 89% reduction in mercury cell capacity since 2002.
  - The chlor-alkali sector accounts for less than 1% of total global natural and man-made mercury emissions.
  - WCC members have also reduced their mercury emissions by 85% since 2002.

- WCC and its member associations actively promote utilising best available techniques (BAT) and best environmental practices (BEP) at existing facilities until their closure or transition. Best practices supported by the industry include:
  - **Monitoring mercury-containing waste:** mercury-containing waste should be managed in an environmentally sound way and controlled by national authorities. Basel Convention Guidelines should be taken into account, and national legislation and regulations should be followed.
  - **Managing mercury surplus from decommissioned cells:** the end-of-life mercury from shutdown or converted cells is 99.9% pure and equivalent to virgin mercury; end-of-life mercury should be managed in an environmentally sound manner and in accordance with the global Responsible Care® principles of the chemical industry that promote best practices when transporting, storing and disposing of mercury.

- Specific actions (on a global basis) include:
  - Organising stewardship workshops in key emerging regions to share BAT/BEP guidelines for chlor-alkali facilities.
  - Sharing information on emerging technologies and practices to enhance chlor-alkali production, extending beyond current BAT/BEP guidelines to include other production related developments and innovations (e.g., recycling hydrogen chloride, using cogeneration and steam).
  - Translating and disseminating industry guidance documents at the regional and global level.
  - Promoting technical exchanges and transfers.

Protecting life below water

Chlorine chemistry helps destroy invasive species that damage aquatic ecosystems.

As ships traverse the globe, they can bring with them plants and animals from other areas in their ballast water, which has the potential to disrupt local ecosystems. When the ship's cargo is added, this ballast water is pumped out for stability, inadvertently releasing these 'invasive' species into the environment. These species can upset the balance of local ecosystems. By carefully treating this ballast water with hypochlorite (or bleach), these species are exterminated, as is their impact on the environment.

A Role for Chlorine Chemistry in Managing Ship Ballast Water

Under the International Maritime Organisation's Ballast Water Management Convention, ships of nations that are parties to the convention will be required to treat their ballast water before discharging it to receiving waters, to help protect aquatic ecosystems globally. This will help achieve the UN Sustainable Development Goal #14, which focuses on preserving life below water. Available ballast water treatment technologies include chlorine-based methods that employ hypochlorites or chlorine dioxide to destroy "stowaway" organisms in ballast water tanks. In 2019, WCC issued a brief on this topic that presents an overview of the main treatment technologies for ballast water and some considerations for each technology. It can be accessed at **https://worldchlorine.org/publications/**.

Protecting life on land

Chlorine chemistry helps enhance life on land through its role in the manufacture of crop protection compounds.

Over 80% of the most commonly used crop protection compounds use chlorine chemistry in the manufacturing process or chlorine is in the final product. These agricultural inputs improve yields, reduce food waste, reduce soil erosion, and help prevent habitat loss. By preserving more land for natural habitats, fewer species are threatened by habitat loss.


15
LIFE ON
LAND

Partnerships promoting Stewardship and Sustainable Development

WCC's Mission and Goals depend upon the partnerships it forges with organisations around the world. WCC is inherently reliant on its regional members working together to promote stewardship within the industry, and to share chlorine chemistry's benefits to external stakeholders. In addition to the collaboration WCC fosters with other chlor-alkali associations, WCC also partners with external institutions such as the UN and philanthropic organizations.

The many chlor-alkali associations around the globe that make up the WCC leverage their partnership to promote stewardship and safety within the industry. Knowledge is exchanged within WCC on the safe production, handling, and transportation of chlor-alkali products (more detail provided below). Additionally, as previously discussed, WCC has a formalised partnership with the UN on mercury emissions reduction and continues to partner with external stakeholders to bolster the impact and expertise at the WCC Water Forums held around the globe.

How is WCC contributing?

The WCC safety programme promotes continuous improvements in global safety performance – both at facilities and during product transportation. Key initiatives include:

- **WCC incident reporting and tracking programme:** the WCC Global Safety Team tracks and shares lessons learned in major incidents to help prevent future incidents.
- **Preparation and sharing of safety guidelines:** WCC prepares and shares safety guidelines across national and regional associations, disseminates safety information through the WCC Global Network, and promotes safety to end-users through the ICCA's Responsible Care® program. This includes posters and manuals for the safe operation of equipment and handling of chlorine products, available or linked to at the WCC website, **www.worldchlorine.org**.
- **Active participation in stewardship workshops:** WCC participates in stewardship workshops that are organised across the globe offering expert presentations, allowing further sharing of best safety practices and lessons learned.
- **Safety Seminars:** WCC holds an annual Safety Seminar to share experiences and learnings with as wide an audience as possible:
  - In 2019, WCC held a **Safety Seminar in Johannesburg**, South Africa. With over 60 participants from across Africa, Asia, Europe, and North America, the seminar brought together producers, distributors and users of chlorine. The seminar covered many topics pertaining to chlorine safety, including chlorine incident avoidance and risk assessment, and the vital role that training plays in the safe handling of chlorine.
  - In 2018, WCC held its annual **Safety Seminar in Perth**, Western Australia and brought together global industry experts in their respective fields. The seminar included sessions on the US Department of Homeland Security's Jack Rabbit Chlorine Release Trial, process safety management (PSM), employee engagement/training, accidental mixing, mechanical integrity, and lessons learned.

1 NO POVERTY
2 ZERO HUNGER
3 GOOD HEALTH AND WELL-BEING
4 QUALITY EDUCATION
9 INDUSTRIA INNOVATI INFRASTRU
10 REDUCED INEQUALIT
11 SUSTAINABLE CITIES AND COMMUNITIES
12 RESPONSIBLE CONSUMPTION AND PRODUCTION
13 CLIMATE ACTION
14 LIFE BELOW WATER
15 LIFE ON LAND
16 PEACE JUSTICE AND STRONG INSTITUTIONS
17 PARTNERSHIPS FOR THE GOALS

No goal stands alone

The UN SDGs are intentionally interconnected. Achieving one goal helps achieve another, and no single goal can be fully attained in isolation. Chlorine chemistry has a direct role in helping achieve the many goals previously discussed. However, chlorine chemistry indirectly helps attain other goals as well.

For example, SDG 5, Gender Equality, is bolstered by chlorine chemistry's role in SDG 6, Clean Water and Sanitation. The task of fetching water in developing countries is disproportionately carried out by women. Therefore, achieving SDG 6 helps achieve SDG 5. Taking this further, when people have improved access to safely managed water, students can attend school and parents have more time to participate in the labour force, which helps achieve SDG 4 (Quality Education) and SDG 8 (Decent Work and Economic Growth). As one can see, no goal exists in a silo – they are all linked.

The interconnected nature of the SDGs underscores the importance of SDG 17, Partnerships for the Goals. Achieving any and all of the SDGs relies upon a concerted effort of people in different fields, types of institutions, and geographies coming together. WCC brings together those in the chlor-alkali industry to partner across borders, and it leverages external partners to help achieve the SDGs in multiple disciplines and functions. WCC cannot achieve every SDG on its own; however, we will continue to play our part to promote and foster their attainment today for a better and more sustainable tomorrow.

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