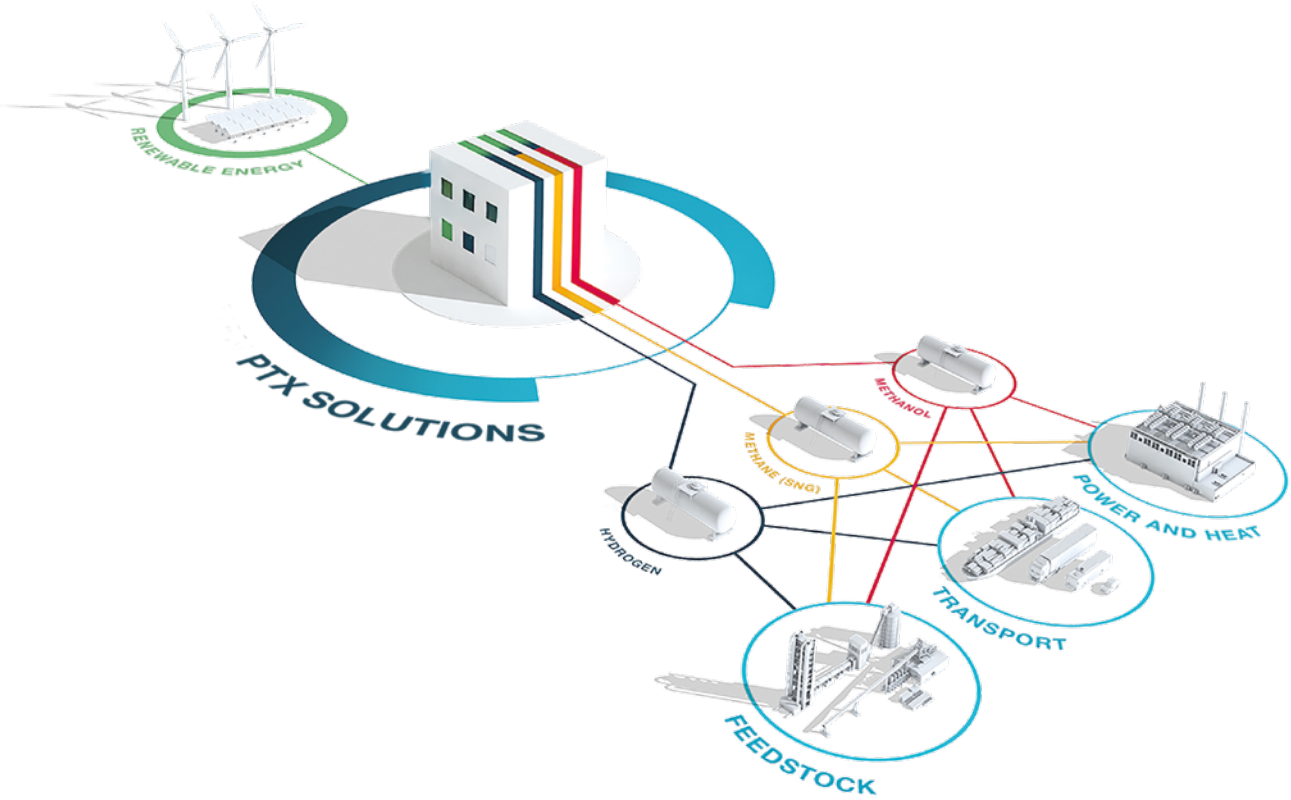
Power-to-X reference cases

Power-to-X converts electricity from renewable sources into carbon-neutral gas, liquid fuel, heat, or chemicals, making that clean energy easier to store and transport.



Everllence

Everllence offers Power-to-X solutions for synthetic fuel production and long-term energy storage. As well as preventing the wastage of valuable renewable energy resources (RES), synthetic fuels created by Power-to-X allow the decarbonization of sectors that are difficult or impossible to electrify. Here are some examples of our current Power-to-X projects.

Power-to-X put into practice

System solutions

Power-to-Gas (PtG)
Surplus renewable energy is used to run an electrolysis plant which breaks water down into hydrogen and oxygen. The hydrogen is then put into a methanation reactor with carbon dioxide, resulting in synthetic methane. The synthetic gas can either be stored or used directly as electricity or fuel for transport.

Power-to-Liquid (PtL)
Everllence is active in both main routes to production of liquid synthetic fuels: methanol synthesis and the Fischer-Tropsch process. Methanol synthesis produces green methanol which can be used as a fuel or chemical feedstock, or can be further synthesized. The Fischer-Tropsch process can produce green Otto fuel, e-kerosene or e-gasoline.

Electrolysis plant

Expertise in hydrogen production
Green hydrogen is made by electrolysis: using the energy of the sun and the wind to split water into oxygen and hydrogen. This green hydrogen can be used directly, stored, or processed further. Everllence's expertise in manufacturing reactor systems has recently been reinforced with the acquisition of electrolysis technology company Quest One.

Quest One has extensive experience in the research and development of hydrogen technology. Across sites in Lübeck, Braak and Augsburg, a team of experts develops and produces stacks and electrolyzers for manufacturing hydrogen with electricity.

Together with Everllence, Quest One is pursuing an ambitious path towards industrialization for large scale electrolysis production.

Power-to-X plant

First European power-to-gas plant
In a methanation plant, hydrogen is made to react with carbon dioxide. The result is e-methane.

In 2013, in cooperation with Audi AG, Everllence helped build Europe's first power-to-gas plant to provide vehicles with a cleaner fuel. The plant, located in Werlte, in Northern Germany, has now been taken over by kiwi AG and is still the largest in Europe, with a six-megawatt capacity.

Everllence equipped the plant with a key piece of technology: a state-of-the-art methanation reactor that transforms hydrogen and carbon dioxide into climate-neutral e-methane.

Based on our experience with the Werlte plant, Everllence is continuously optimizing the methanation design.

Hydrogen infrastructure project eFarm in Schleswig-Holstein, Germany

Power-to-Gas plant operated by kiwi AG in Werlte, Germany

Green methanol reactor

Power-to-X fuels for power and heat generation
Everllence is supplying the methanol reactor for an e-fuels pilot plant currently being built by HIF, an international e-fuels company based in Chile, with the participation of Porsche AG, Siemens Energy and other project companies near the southern Chilean city of Punta Arenas.

The Haru Oni pilot project takes advantage of the excellent wind conditions in southern Chile to generate synthetic, climate-neutral fuel with the help of renewable power. Chile offers ideal conditions for the production of green hydrogen and synthetic fuels made from it. Everllence has extensive expertise in the manufacture of reactor systems for the production of synthetic fuels as well as numerous references in the field of methanol synthesis.

Future proof gas and dual fuel engines

Flexible transition towards green power and heat generation
E-methane, hydrogen, methanol, and ammonia are green fuels when produced in Power-to-X plants with renewable energy. E-methane has the same low emissions of nitrogen oxides, sulfur oxides and particulate matter as liquid natural gas (LNG), but can be carbon-neutral when made from green hydrogen. Until it becomes more widely available, e-methane can be blended with LNG. Our four-stroke dual fuel and gas engines adapt easily to it.

The gas engines 35/44G TS, 51/60G and 51/60G TS, which are commonly used in power stations, can be operated with a hydrogen volume share of up to 25 % in the gas mixture. Everllence is currently working on the development of engines for 100 % hydrogen usage. In due course, our customers will also be able to use other alternative fuels such as ammonia and methanol.

Climate-neutral container vessel

First container ship to run on green SNG/e-methane
Converting ships from heavy fuels to renewable energy is an urgent task for the maritime industry. Operators are cutting emissions to meet the International Maritime Organization's goal's goal of halving them by 2050.

The ElbBLUE made headlines in 2017 when its engine was retrofitted to a 51/60DF dual fuel unit – the first conversion of its kind globally. It proved that liquid-fuel engines can be converted to LNG operation with a significant reduction in emissions.

In 2021, the ElbBLUE was again a pioneer: Everllence enabled it to run on climate-neutral e-methane from a Power-to-Gas plant in Werlte, Germany – built by Everllence for Audi in 2013.

A major advantage of the fuel switch: existing infrastructure remains in use, making assets future-proof.

This case highlights the Power-to-X potential in shipping, where batteries are not a viable option.

Methanol reactor for an e-fuels pilot plant being built near Punta Arenas, Chile

The 35/44G TS can be operated with synthetic climate-neutral fuels

The ElbBLUE was fueled with green e-methane / SNG generated in the PtG plant in Wertle, Germany

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Powering the transition to net zero

Renewable energy is the key to decarbonization. To match the areas with the highest potential for renewable energy production with the areas with the highest energy demand, we need to convert renewable power into synthetic fuels. This not only provides a solution to the volatility of RES but also facilitates the decarbonization of sectors which are difficult to electrify, such as the aviation or transport sectors.

Everllence is committed to providing solutions for the decarbonization of the marine, energy, and industry sectors. We drive forward large-scale industrial electrolyzers to cover the demand for hydrogen for power generation and industry use. Together with technology from Quest One, we aim to become one of the world's top three producers of PEM Electrolysis units.

Everllence is a market-leading provider of methanation technology, converting green hydrogen and carbon dioxide to e-methane or other derivatives in our DWE reactors. We have developed solutions for a wide range of plant capacities, from skid-based solutions up to large-scale production plants. In addition, we offer full engineering, procurement and construction (EPC) services for power plants.

Combined with our solution competence this puts us at the forefront of production of synthetic green fuels.

Learn more about the benefits of Power-to-X:
www.everllence.com/energy/solutions/power-to-x

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