Siemens Water Solutions

Upstream where it matters most

siemens.com/water-solutions
The shifting perception of water

Water. As both a necessary component and a byproduct of the oil and gas industry’s upstream activities, it’s an ever-present—often complex—challenge to your business. But it doesn’t have to be. At Siemens Water Solutions, we’re working to shift the perception of water from challenge to opportunity. From cost concerns to regulatory compliance, wherever your priorities lie, we’ll work with you toward the best possible solution. That way, you can focus on what you do best, while we find the opportunity behind each water-related challenge.

We are deeply committed to industry-leading treatment of water for reuse and reinjection—not discharge.

As part of our tireless effort to improve processes and protect systems worldwide—while mitigating regulatory and financial pressures—we continue to invest in R&D, innovation, and advanced technologies. Siemens’ advancements come in all areas of upstream water treatment. We’ve been improving performance and profitability of existing technologies with our improved Brise™ pump for flotation systems and our PerforMedia™ oil removal media in filtration systems. We’ve developed new technologies to support our customers in offshore services such as zinc removal technologies. And we are developing technologies for a future where our customers understand the potential value of water and want to reuse it by treating it with our Revive™ advanced produced water membrane systems.

Our commitment to innovation has led to more than twenty oil/water separation patents, with ten more pending.
Processing water

Products and Solutions

As a single-source provider of water treatment solutions and services to the oil and gas industry, Siemens’ comprehensive expertise includes produced water treatment for both onshore and offshore environments. Whatever your upstream project calls for, turn to Siemens when it matters most.

Produced Water Treatment Process Map

Primary
- Corrugated Plate Separators/Interceptors (CPS/CPI)
- Hydrocyclones (Liquid/Liquid; Solid/Liquid)

Secondary
- Dissolved Air/Gas Flotation (DAF/DGF)
  - Brise™ Pump
  - Spinsep™, Veirsep™, Combosep™ Systems
- Induced Air/Gas Flotation (IAF/IGF)
  - Hydrocell™, Quadricell™ Systems

Tertiary
- Monosep™ Walnut Shell Filters
- Auto-shell™ Walnut Shell Filters
- PerforMedia™ Oil Removal Media

Advanced
- Revive™ Oily Water Membrane Systems

Whether cost or regulation is the driving factor, we can create solutions that meet your goals.

Providing Specialized Solutions to the Oil & Gas Industry

Our service offerings are aimed at both brownfield and greenfield installations providing necessary expertise and support for Siemens and competitive equipment.

With Siemens as your long-term, day-to-day partner providing local service and global support, you reduce critical risk elements—especially unplanned downtime, safety, and environmental impacts—providing your operations with a significantly smaller risk profile.
Produced water treatment solutions

Overview

To fulfill your upstream produced water treatment needs, Siemens offers a complete range of solutions for treating produced water for either discharge into the environment, reinjection, or beneficial reuse. And through continuous technological innovation and new product development, we’re fully committed to minimizing our systems’ footprint and weight, maximizing your time, and addressing your project’s unique location and requirements.

Primary
Siemens offers technologies in a range of sizes and materials—designed to address any oil separation or de-sanding project. Our liquid/liquid hydrocyclones are a well-proven solution for optimal de-oiling of produced water, while our solid/liquid hydrocyclones will effectively remove sand down to as little as five microns. Our corrugated plate separators offer a great solution for oil and solids removal in environments where hydrocyclones are not an option.

Secondary
When strict regulations call for further oil or contaminant reduction, Siemens has the right solution. Dissolved gas flotation (DGF) Brise™ Pump, Spinsep™, Veirsep™, Combosep™ Systems or induced gas flotation (IGF) Hydrocell™, Quadricell™ Systems are available in a range of configurations, including vertical and horizontal units that enhance treatment efficiency, and reduce float volume and chemical usage.

Tertiary
With tertiary produced water treatment technologies—including Monosep™ and Auto-shell™ walnut shell filters, PerforMedia™ oil removal media, media filters, absorption filters and other compact cartridge filters—Siemens can help meet even the most challenging discharge specifications.

Advanced
For an advanced produced water treatment option, Revive™ oily water membrane systems can be used in beneficial reuse applications with non-detect solids and oil effluent requirements.
Addressing your challenges

Perhaps you’re working in an especially sensitive environment, such as the Castilla oil field described below. Maybe you need to minimize your project footprint, or to maximize the reusable water produced by your upstream activities. Whatever the challenge, by partnering with Siemens during the design phase, you can expect water treatment solutions that are perfectly tailored to your operations, while keeping your long-term costs in mind and in check.

Partnering with the Siemens Water Solutions team during your design phase will help you control costs by considering not just your build, but also your long-term operations.

Supporting a strategic shift

Castilla Field
Llanos Basin, Colombia

Colombia’s largest oil company, state-controlled Ecopetrol, continues to capitalize on the country’s decade-long oil boom—even as crude oil prices have declined. That’s because, as other oil companies around the globe have reacted by cutting capital expenditures, Ecopetrol has focused on better recovery rates. They’ve been successful, in part, through their partnership with Siemens Water Solutions.

Recognizing the increased need for water treatment systems to bolster oil recovery rates, Ecopetrol engaged Siemens to install production water treatment facilities at Castilla Field, the company’s most important site. Castilla’s environmentally sensitive location is also home to a thriving agricultural community and hundreds of tropical wildlife species—demanding a solution that met the strictest of standards. By partnering with Siemens Water Solutions for a total of five treatment facilities, Ecopetrol is able to efficiently treat the water generated by this site’s heavy crude. The produced water solution enabled the treated water to be returned to the environment in a safe, reusable state. Partnering with Siemens Water Solutions enabled Ecopetrol to refocus its strategy on production instead of exploration, helping them to thrive in a difficult global market.
## Customized solutions matter

No two upstream projects are exactly alike, which is why our multi-disciplinary team of in-house experts design custom water treatment systems for your specific needs.

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<thead>
<tr>
<th>Service</th>
<th>Description</th>
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<tbody>
<tr>
<td>Feasibility studies</td>
<td>Feasibility studies can be performed to facilitate the proper design of a solution that meets your cost and location requirements, helping you avoid costly mistakes.</td>
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<tr>
<td>Retrofits</td>
<td>Sometimes situations change and new equipment is needed, but occasionally seemingly outdated equipment can be made useful again. Siemens can help you successfully upgrade your current equipment to meet today's demands.</td>
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<tr>
<td>Pilots</td>
<td>Sometimes the only way to determine the feasibility of a solution is to test it in the field. Our experts work collaboratively with you to determine the most effective pilot program that provides you with the confidence and data you need.</td>
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<td>Rental and leasing services</td>
<td>Our short-term, temporary, RO/utility or produced water treatment services are available on a rental or leased basis to help solve specific water treatment problems quickly, flexibly, and efficiently.</td>
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<tr>
<td>Flowback services</td>
<td>Siemens Flowback Services ensure smooth and efficient operations for service companies and operators around the world. This includes initial start-up well completion unloads (using everything from sodium bromide to zinc bromide) or well stimulation unloads (from scale squeezes to acid workover).</td>
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## Expertise matters

With over 30 years of experience, more than 600 produced water treatment systems in 23 countries, and a 360-degree knowledge of the oil and gas industry, we understand the challenges you face—starting with your upstream activities.

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<td>Total cost of ownership</td>
<td>Before you initiate upstream activities, consider engaging the Siemens Water Solutions team. They will assess the complete lifecycle of your project and tailor solutions that provide efficiencies, equaling long-term savings.</td>
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<td>Risk management</td>
<td>Siemens provides you with a proactive system of risk management with a focus on safety. As experts at assessing possible—even unexpected—operational and environmental risks, we'll work with you to avoid and minimize your exposure.</td>
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<td>Shared values</td>
<td>Innovation is imperative in our business, as environmental regulations and technology advances are always in flux. Our goal is to keep you ahead with solutions and expertise that help you—and your teams—live up to your values.</td>
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