

# MARINE & OFFSHORE CASE STUDY

## **ECOCEANE**



### Challenge:

Ecoceane needed to accelerate and streamline its response to increasing customer demand for its revolutionary pollution cleaning vessels.

### Solution:

Ecoceane uses Dassault Systèmes' 3DEXPERIENCE® platform for the development and manufacture of its vessels, including CATIA for design, SIMULIA for virtual product simulation, DELMIA for digital manufacturing and 3DVIA for documentation and customer presentations.

### Benefits:

With the 3DEXPERIENCE platform, Ecoceane has enhanced its performance in bringing innovative vessels to market making it a global leader in the fight against marine pollution. With the 3DS applications, Ecoceane has reduced project cycle time by 50%, and improved collaboration of all stakeholders from the early stages of the design process, thus improving the design quality and production-readiness of each vessel.

Over 70% of the earth's surface is covered by water. It is one of Earth's most precious natural resources. With globalization placing increasing demands on maritime shipping, when accidents occur, the consequences to the environment can be catastrophic. Tankers leaking oil, vessels dumping their refuse inadvertently without regard for aquatic life or coastal residents; the negative environmental impact is real – for fauna, flora and humans alike.

### An innovative concept

As experienced during disasters such as Exxon Valdez oil spills in Alaska in 1989 or the Deepwater Horizon in the Gulf of Mexico in 2010, cleanup efforts are monumental tasks and their success depends on how fast authorities can intervene and whether they have the appropriate equipment to do the job.

From France's Brittany, Eric Vial and Robert Gastaldi, co-founders of Ecoceane created in 2003, decided to boost the efficiency of vessels that are used to collect the liquid and solid waste floating in the water. They realized that despite significant means and efforts employed to recover hydrocarbons after an oil spill, very few hydrocarbons were recovered at sea before reaching the coastlines and causing irreparable damage. They invested more than 10 million euros and seven years in research and development to come up with an innovative concept that would tilt the odds in favor of clean-up operations forever. Their

patented technology equips clean-up vessels that can collect more oil and waste per hour and with a capacity ten times that of traditional vessels. A revolution.

"Our customers are government agencies, harbor managers, ship-owners and shipyards and their needs vary," said Eric Vial, President of Ecoceane. "We therefore design and build water-cleaning boats for different situations: from harbor, lake and river clean-up and coastal protection to out-of-port operations to recover all floating waste and oil spill monitoring and recovery in high seas. Our technology is unique and our boats are the only ones capable of collecting hydrocarbons at sea up to a wind and sea force of 6 or 7 on Beaufort scale and at speeds of 4 to 5 knots. Our competitors are limited to a wind force level of 3."

The company's founders invented an innovative way to separate water from hydrocarbons that prevents emulsion. "With our technology, we avoid a mayonnaise-like emulsion when collecting hydrocarbons that would otherwise require a specific process to separate the hydrocarbons from the water before they can be stored in tankers. We gain in efficiency this way." Its vessels transfer only pure emulsion-free hydrocarbons into tankers as they work. Once a tanker is full, another can take its place. "This continuous exchange of storage means our vessels have an unlimited 24/7 recovery capacity during a clean-up operation," Vial said. "More than 80 vessels have been sold in over 25 countries around the globe since Ecoceane was created. There is strong demand for our technology."



**"Enabling designers, manufacturing staff and customers, each with their own ideas, expertise and know-how, to participate on a project is the best way to create the most efficient design."**

— Benjamin Lerondeau  
Naval Architect, Ecoceane

Ecoceane provides its customers with end-to-end design to production services. "We tailor the design of each vessel to a customer's specifications and then have the boat built at one of the shipyards we work with around the world, a solution that satisfies customers' need for proximity," Vial said.

## Harnessing the power of integration

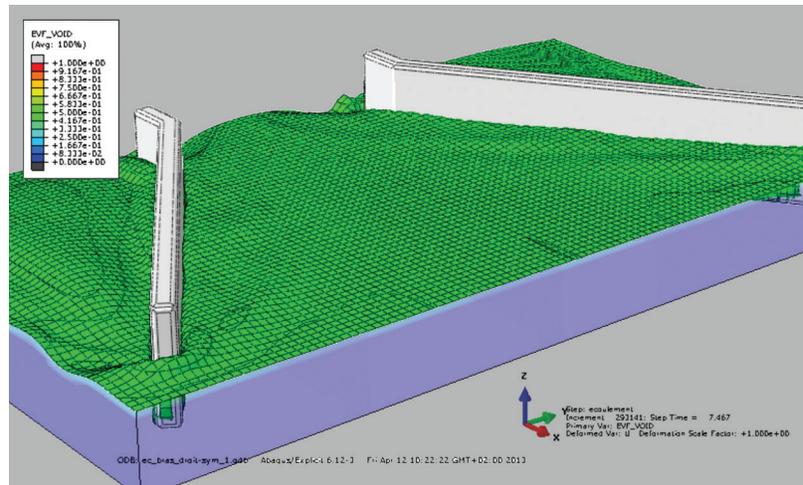
To develop its vessels, Ecoceane uses Dassault Systèmes' (3DS) **3DEXPERIENCE** platform, with CATIA for design, SIMULIA for virtual product simulation, DELMIA for digital manufacturing and 3DVIA for communication with shipyards and customers.

"For structural steel shipbuilding design, CATIA has built-in job-related features such as sheetmetal and structural steel design, that save us a lot of time," said Benjamin Lerondeau, Ecoceane's naval architect. "As a result, we have more time for innovation."

The link between CATIA and SIMULIA enables Ecoceane architects to seamlessly use the 3D Digital Mock-Up created in CATIA to run simulations of the boat performing under working conditions as it sucks up water and pollutants into the vessel. "We virtually simulate the vessel collecting water and hydrocarbons and visualize the flow of these liquids through the different compartments of the boat where filters separate the hydrocarbons from the water," Lerondeau said. "The hydrocarbons are then eventually transferred to a tanker and the water released into the sea. We want to avoid releasing the pollutants into the sea instead of the water. With SIMULIA we can see if the vessel functions properly before it is built. The virtual simulations are so realistic and precise that we could eliminate physical prototypes, which are expensive and time-consuming to produce."

Engineers use SIMULIA for stress analyses and the results are used to adjust the 3D design in CATIA if needed. "Working on the same platform means there are no gaps and no interruption in the development chain," Lerondeau continued. "When the simulation and analysis phase is complete, we then transfer the 3D model to a virtual production environment in DELMIA to digitally prepare all manufacturing operations, including the sheet metal cutting plans and assembly procedures. We then use 3DVIA to create assembly instructions in 3D for the shop floor. With 3D, we eliminate misunderstandings that can lead to errors."

Ecoceane's sales force uses 3DVIA for their customer presentations and to allow future boat owners to experience their vessel before it is completed. "It has changed our relationship with our customers," Lerondeau said. "They are excited to be involved in the design of their vessel and it saves us time since we know what they want from the early design stage, before it is too late or too costly to implement changes," he added. "Enabling designers, manufacturing staff and customers, each with their own ideas, expertise and know-how, to participate on a project is the best way to create the most efficient design. As a matter of fact, with everyone working



Top image: Latest line of pollution-cleaning vessels – ReverseGlop – designed with CATIA

Bottom image: SIMULIA virtually simulates the boat's system collecting hydrocarbons on water

### Focus on Ecoceane

France-based company devoted to research, development and commercialization of vessels collecting hydrocarbons and floating solid waste at sea, without using chemicals.

**Products:** Workboats for marine pollution cleanup

**Employees:** 25

**Headquarters:** Paris, France

**For more information**  
[www.ecoceane.com](http://www.ecoceane.com)

### About Keonys

For more than 20 years, Keonys has been a preferred PLM (Product Lifecycle Management) and 3D solutions partner to customers of all sizes and in all industries, helping them develop and manufacture better products and innovative services faster. Keonys provides value-added business consulting services, PLM project implementation and integration, training and support to its 1,500 customers in France, Belgium, Luxembourg, Netherlands, Germany and Switzerland. Keonys is Europe's foremost integrator and distributor of PLM solutions from Dassault Systèmes.

**For more information**  
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on the same integrated platform and digitally interacting and exchanging on the same master data, we have reduced project development time by up to 50%."

Dassault Systèmes' partner Keonys was involved from the very start of Ecoceane's interest in the 3DS applications and was instrumental in helping Ecoceane implement the appropriate solutions for its development activities. "They began by assessing our installation and analyzing how we could improve our productivity," Lerondeau said. "They proposed the applications from the 3DEXPERIENCE platform that best suit our line of work and then provided the necessary training that would enable us to make the most of each application. Their expertise was essential to the success of our implementation."

With its latest line of pollution-cleaning vessels – ReverseGlop – Ecoceane proposes a way for shipyards to incorporate its technology in the stern of any boat under construction that is more than 25 meters long. Its technique preserves the vessel's normal functions in the aft and transforms it into an oil spill response vessel when the boat shifts into reverse. "This configuration means any service – military, cargo or even ice-breaking – vessel can be transformed into a pollution clean-up boat," Vial said. "More than ever, we need a robust solution to help meet our development and sales objectives. The 3DEXPERIENCE platform is a fully-fledged part of our strategy and I believe that together with Dassault Systèmes, we can do great things for the protection of our earth's waters."

## Our 3DEXPERIENCE® Platform powers our brand applications, serving 12 industries, and provides a rich portfolio of industry solution experiences.

Dassault Systèmes, the 3DEXPERIENCE® Company, provides business and people with virtual universes to imagine sustainable innovations. Its world-leading solutions transform the way products are designed, produced, and supported. Dassault Systèmes' collaborative solutions foster social innovation, expanding possibilities for the virtual world to improve the real world. The group brings value to over 190,000 customers of all sizes in all industries in more than 140 countries. For more information, visit [www.3ds.com](http://www.3ds.com).



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