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News

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Renewable energies

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Energy storage

Naval Group\* **has successfully generated electricity continuously for 18 days** in representative submarine patrol operational conditions, **thanks to a fuel cell (FC) powered by a hydrogen production system developed in partnership with IFPEN**. This system, based on onboard diesel reforming to produce hydrogen fuel for the FC, represents a breakthrough in the field of air-independent propulsion systems\*\* for conventional (non-nuclear) submarines. With the system, their submersion time can be considerably increased. This breakthrough - a world record - demonstrated remarkable hydrogen production, with stable operation of the various units making up the system, paving the way for potential maintenance-free submarine use for a year. IFPEN's teams made a significant contribution to this success within the framework of a project conducted in partnership with [Naval Group](#) (completed at the end of 2015), which was responsible for industrialization and marketing. A video demonstrating the system is available:

\* *French industrial group specializing in the naval defense industry and ocean renewable energies*

\*\* *Air Independent Propulsion systems (AIPs) allow submarines to operate over long periods of time without using external air and without returning to the surface*

[To find out more: Hydrogen](#)

Onboard hydrogen production in submarines  
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