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# Hybrid Power Choices on the Increase for Maritime

THE MARITIME INDUSTRY IS INCREASINGLY INVESTIGATING THE POTENTIAL FOR HYBRID POWER AS A storage and delivery solution for when either short or long-term auxiliary power is required.

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**T**he American Bureau of Shipping (ABS) is an industry leader in providing guidance for the safer development and deployment of hybrid power and supports its adoption with a strategy that focusses on the three areas of use covering storage, distribution, and generation. This strategy began with the establishment of the Advisory on Hybrid Electric Power Systems in February 2017 and continued with the Lithium Battery Guide in May 2017. The Advisory on Hybrid Electric Power Systems takes a measurable approach to evaluating potential advantages and disadvantages, challenges and level of readiness for the primary hybrid energy storage and generation systems, and

components most suited for marine and offshore applications.

## [Supercapacitor Guide](#)

The most recent addition to the publication series was the Supercapacitor Guide in November 2017. Use of supercapacitors is of increased interest when fast energy delivery is required during a peak power condition, such as when using thrusters. ABS produced the Guide to provide requirements and reference standards to facilitate effective installation and operation of on-board supercapacitors. Its purpose is to establish safety guidelines for owners, operators, shipyard builders, designers, and manufacturers.



*A key variable in energy storage planning is an appropriate risk assessment.*

The Supercapacitor Guide delineates types of supercapacitors, including electrochemical capacitors and lithium-ion capacitors, and subsequently defines requirements for design, construction, and installation of supercapacitors in marine and offshore applications.

As a commercialised energy storage device, supercapacitors have a high-power density and a fast charging and discharging process to augment other power sources and can greatly improve the efficiency of traditional energy sources.

This technology is continuously evolving with respect to materials and design. As such, alternative arrangements or new supercapacitor technologies can be considered provided it can be demonstrated, either by service experience or a systematic analysis based on sound engineering principles, that they meet the overall safety standards of the Guide and ABS Rules.

### The Future of Hybrid Power Solutions

When we look into the wider future of hybrid power solutions for shipping, we can foresee a growing interest in applications that are achievable today and in those that will be possible in the future.

As supercapacitors provide high density short-term power, they could for instance be used to start up a generator or motor on a vessel, which could consequently draw auxiliary power from lithium-ion batteries for the majority of its voyage. These combinations of energy storage technologies provide significant advantages for hybrid deployments.

A ship with hybrid power approaching an ECA could switch from some of its conventional generators and use batteries for a planned time period.

Hybrid power could also be used to improve overall efficiency of auxiliary installations. Instead of the practice of inefficiently running two generators at 50% load, it is

possible to run one at 80% and keep a 'spinning reserve' of hybrid power, reducing the overall fuel consumption while also reducing wear on generators. Current hybrid installations tend to be retrofits to existing vessels to create an OPEX benefit. In the future, vessel designers could conceivably replace some generator capacity with hybrid power, requiring fewer units and thus creating a CAPEX reduction.

### Appropriate Risk Assessment

Power management systems coupled with battery and capacitor management systems also provide an appropriate safety layer for vessel operations. Because the typical operating environment in the maritime industry will differ from that considered when a supercapacitor system was originally designed, ABS would normally recommend a review of the environmental and operational aspects prior to adoption. A key variable in energy storage planning is an appropriate risk assessment. This assessment supports the development of proper safety measures and is also used to confirm safeguards and reassure crew that they can perform their regular tasks in proximity to a containerised supercapacitor installation.

### Alternative Energy Sources

Ferries making short runs can already be all-electric powered, with rapid charging technology enabling them to maintain planned passage speed and use fast re-charging in port to prepare for the return journey.

The ABS hybrid power publication strategy continues in 2018 with the release of its next guide, covering DC Power Distribution. Our future work will also focus on energy generation from alternative sources, including fuel cells, wind and solar power and their application in the maritime industry.

[i. www2.eagle.org](http://www2.eagle.org)



Photo courtesy of ABS  
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