

Electric Boats, Small Submarines and Autonomous Underwater Vehicles (AUV) 2014-2024



Phone: +44 20 8123 2220
Fax: +44 207 900 3970
office@marketpublishers.com
<https://marketpublishers.com>

Electric Boats, Small Submarines and Autonomous Underwater Vehicles (AUV) 2014-2024

Date:	April 1, 2016
Pages:	222
Price:	US\$ 4,975.00
ID:	MA11E65EBCDEN

Ten year forecasts

Marine electric vehicles are now a rapidly growing market due to new capability, affordability and legislation banning or restricting internal combustion engines. Our research finds that the market for electric water craft, including those on and under water, will increase rapidly from \$2.6 billion in 2013 to \$7.3 billion in 2024. In addition there is a market for electric outboard motors that will more than triple in value as high power pure electric versions become increasingly viable. There is also a new market for water borne electric aircraft.

Scope of coverage

This report covers hybrid and pure electric marine electric vehicles; on-water and underwater, inland and seagoing. It covers the closely allied topics of electric outboard motors and electric planes operating from water and even has some mention of electrification benefiting conventional craft. Overall, it encompasses leisure, military, industrial, commercial and other applications and the technology trends.

Marine electric vehicles make new things possible and increasingly they have lower cost of ownership and are the only practicable way of meeting the newer, more onerous pollution regulations for inland waterways and harbours. Marine electric craft are increasingly made by existing shipyards making conventional craft but there is also a trend for those making land or airborne electric vehicles to make marine ones as well. Sometimes we see Apple levels of innovation with new entrants, something notably absent with such things as electric cars. As with all electric vehicles, the advances in the components in these vehicles and their infrastructure are proceeding disruptively rather than incrementally and the report discusses this in the marine context.

The many interviews and investigations carried out in the preparation of the report have revealed a market that is larger and growing faster than is popularly assumed, though some incumbents miss what is happening with new entrants and in other parts of the world. The military aspect for example is very concentrated in the USA and involves small numbers and large unit prices until such things as swarming robot jellyfish become a reality. Water borne electric aircraft and the hybridisation of ocean going leisure yachts are impressive in Europe, where the leader in AUVs is located. Some of the most advanced pure electric and fuel cell hybrid AUVs are in India and Japan. Clearly a global view, presented here for the first time, is essential if the full potential is to be understood. 50 organisations from across the world are profiled and many more are mentioned in context.

Table of Content

1. EXECUTIVE SUMMARY AND CONCLUSIONS

1.1. The whole picture

1.1.1. Global marine EV forecasts 2013-2024

1.2. Market drivers and centers of excellence

1.2.1. AUV market

1.2.2. Marine EVs compared to all EVs

- 1.3. Forecast rationale
- 1.4. Benefits of marine electric vehicles
 - 1.4.1. Price sensitivity
 - 1.4.2. Favoured Marine EV Technologies
 - 1.4.3. Examples of backup data
- 1.5. Latest view from Europe
- 1.6. Power electronics lessons from Battery Osaka, PV Expo, Smart Grid Expo Sept 3-5 2014, Osaka, Japan
- 1.7. Lessons from Electric and Hybrid Marine World Expo June 2014, Amsterdam
- 1.8. Effect of 2015 oil price collapse on electric vehicles

2. INTRODUCTION

- 2.1. Definitions and scope of this report
- 2.2. The EV value chain
- 2.3. Benefits of marine electric vehicles
- 2.4. Pure electric marine vehicles
- 2.5. Hybrid marine vehicles
- 2.6. Born electric
- 2.7. New structural advances and smart skin
- 2.8. Electric outboard motors
 - 2.8.1. Regen Nautic Inc USA
 - 2.8.1. Outboard motor market size
 - 2.8.2. Oceanvolt SD electric saildrive system wins Pittman Innovation Award
- 2.9. Tightening air pollution laws boost e-ships
- 2.10. The death of coal and oil boost EVs
- 2.11. Examples of Interviews Concerning High Power Energy Harvesting on Marine Craft 2015
- 2.12. Examples of presentations at Electric and Hybrid Marine Amsterdam June 2015

3. SURFACE CRAFT

- 3.1. Commonality with land EVs
 - 3.1.1. Grants for land and water
 - 3.1.2. Effect of land EV manufacturers entering marine
 - 3.1.3. Pollution laws back electric boats - India, Europe, Taiwan, USA
- 3.2. Small electric surface craft
 - 3.2.1. Andaman and Electric Boats Thailand
 - 3.2.2. aquawatt Mechatronik und Yachtbau Austria
 - 3.2.3. Bionx Austria, Canada
 - 3.2.4. Boesch Boats for water skiing Switzerland
 - 3.2.5. Boote Marian luxury inland boats Austria
 - 3.2.6. CleaneMarine Denmark
 - 3.2.7. Duffy inland electric deck boats, USA
 - 3.2.8. Epic Wakeboats hybrid sport boat USA
 - 3.2.9. Erun GmbH inland sport boats Switzerland
 - 3.2.10. Kona USA
 - 3.2.11. Leisure Life USA
 - 3.2.12. MarineKart Switzerland
 - 3.2.13. Mercedes Germany
 - 3.2.14. Quadrofoil, Slovenia
 - 3.2.15. Ruban Bleu France with 2013 interview
 - 3.2.16. Seaway USA
 - 3.2.17. Supiore Denmark
 - 3.2.18. Tamarack Lake foldable inland boat USA
- 3.3. Large electric surface craft

- 3.3.1. ALU MARINE France with 2013 interview
- 3.3.2. Callender Designs UK
- 3.3.3. CAT hybrid powertrain USA
- 3.3.4. Corvus Energy Canada
- 3.3.5. DNV GL inland ferries go pure electric, Norway
- 3.3.6. Feadship, Netherlands
- 3.3.7. Ferguson's shipyard in Port Glasgow, UK
- 3.3.8. Foss Maritime Canada, USA
- 3.3.9. GE Power Conversion USA
- 3.3.10. Havyard to construct ICE platform supply vessel, Norway
- 3.3.11. Hydrogenics New York
- 3.3.12. Juliet Marine Systems USA
- 3.3.13. Kitegen Italy and Sauter UK
- 3.3.14. Larger solar lake boats Switzerland
- 3.3.15. MW Line Switzerland
- 3.3.16. SAFT - electrification of ferry boats
- 3.3.17. Sauter supertanker
- 3.3.18. SCOD / Atlantic Motors USA
- 3.3.19. Seagoing yachts France
- 3.3.20. Tag Yachts South Africa, New Zealand
- 3.3.21. Tugboats UK
- 3.3.22. Türanor PlanetSolar Germany
- 3.3.23. Unmanned boat gathering oil USA
- 3.3.24. Waternet The Netherlands
- 3.4. Electric flying boats
 - 3.4.1. Equator Aircraft Norway
 - 3.4.2. FlyNano Finland
 - 3.4.3. Marine Unmanned Aerial Vehicles UAV

4. MANNED UNDERWATER ELECTRIC VEHICLES

- 4.1. Sea scooters for scuba divers, Italy, China
- 4.2. Divers leg thrusters
- 4.3. Leisure and tourist submarines
 - 4.3.1. Kittredge UK
 - 4.3.2. Odyssey USA
 - 4.3.3. International Venture Craft USA
 - 4.3.4. Hawkes Ocean Technologies USA
 - 4.3.5. Silvercrest/UVI Canada, UK
 - 4.3.6. Submarines that are efficient surface boats
 - 4.3.7. US Submarines Inc USA
 - 4.3.8. Will submarines fly?

5. AUTONOMOUS UNDERWATER VEHICLES (AUVS)

- 5.1. New applications in 2015
- 5.2. Swimmers vs gliders
 - 5.2.1. Definitions
 - 5.2.2. Demand
 - 5.2.3. Gliders
 - 5.2.4. Swimmers
- 5.3. Wave and sun powered sea gliders
 - 5.3.1. Virginia Institute of Marine Science USA
 - 5.3.2. Falmouth Scientific Inc USA
 - 5.3.3. Liquid Robotics USA

- 5.4. AUV swimmers North America
 - 5.4.1. Boeing USA
 - 5.4.2. MBARI USA
 - 5.4.3. Florida Atlantic University USA
 - 5.4.4. Hydroid USA
 - 5.4.5. OceanServer Technology USA
- 5.5. AUV swimmers Europe
 - 5.5.1. Kongsberg Norway
 - 5.5.2. Teledyne USA, Iceland
 - 5.5.3. Mine Destruction AUV UK
 - 5.5.4. Autosub6000 UK
 - 5.5.5. a.r.s Technologies GmbH Germany
 - 5.5.6. Robot cuttlefish Switzerland
 - 5.5.7. DEDAVE Germany
- 5.6. AUV swimmers East Asia
 - 5.6.1. DRDO India
 - 5.6.2. JAMSTEC Japan
- 5.7. Deploying AUVs Canada
- 5.8. Network of unmanned undersea platforms assist manned vessels
- 5.9. Marine quadcopters

6. BIOMIMETIC UNMANNED UNDERWATER CRAFT

- 6.1. Robot jellyfish USA and Germany

7. MARINE DRIVE TRAINS, COMPONENTS AND INFRASTRUCTURE

- 7.1.1. EEI Italy Silent Propulsion System: Sailing boats as series hybrids
- 7.1.2. Drive trains
- 7.2. Traction batteries
 - 7.2.1. The lure of lithium-ion
 - 7.2.2. Cells - modules - battery packs
 - 7.2.3. NiMH vs lithium
 - 7.2.4. The ideal traction battery pack
 - 7.2.5. Recent improvements
 - 7.2.6. Traction batteries today
 - 7.2.7. Trends in energy storage vs battery pack voltage
 - 7.2.8. Move to high voltage
 - 7.2.9. Many suppliers
 - 7.2.10. Pouch problems?
 - 7.2.11. The lure of lithium polymer versions of lithium-ion
 - 7.2.12. Genuinely solid state traction batteries
 - 7.2.13. New chemistries for lithium-ion batteries
 - 7.2.14. Impediments
 - 7.2.15. ABSL
 - 7.2.16. SAFT
- 7.3. Range extenders
- 7.4. Fuel cells
- 7.5. Electric motors
 - 7.5.1. New motors and outboards for boats
 - 7.5.2. AC vs DC
- 7.6. Motor position
- 7.7. Charging infrastructure for marine EVs
 - 7.7.1. General needs and solutions
- 7.8. Case study: Arctic under ice survey

7.9. MBARI research AUV deployment

I would like to order:

Product name: Electric Boats, Small Submarines and Autonomous Underwater Vehicles (AUV)
2014-2024

Product link: <https://marketpublishers.com/r/MA11E65EBCDEN.html>

Product ID: MA11E65EBCDEN

Price: US\$ 4,975.00 (Single User License / Electronic Delivery)

If you want to order Corporate License or Hard Copy, please, contact our Customer Service: office@marketpublishers.com

Payment

To pay by Credit Card (Visa, MasterCard, American Express, PayPal), please, click 'BUY NOW' button on product page <https://marketpublishers.com/r/MA11E65EBCDEN.html>

To pay by Wire Transfer, please, fill in your contact details in the form below:

First name:
Last name:
E-mail:
Company:
Address:
City:
Zip/Post Code:
Country:
Tel:
Fax:
Your message:

* All fields are required

Customer Signature _____

Please, note that by ordering from MarketPublisher.com you are agreeing to our Terms & Conditions at https://marketpublishers.com/docs/terms_conditions.html

To place an order via fax simply print this form, fill in the information below and fax the completed form to **+44 20 7900 3970**