TOP TRENDS IMPACTING MARINA INFRASTRUCTURES

ELECTRIC VEHICLES
ELECTRIC MARINE PROPULSION
RENEWABLE POWER / ENERGY STORAGE
POWER RESCILIENCY
REMOTE SENSING & MONITORING
AUTONOMOUS YACHTING / SHIPPING
SEA POLLUTION & MICROPLASTICS
SEA LEVEL RISE

Anthony Baro - PowerDocks LLC
www.power-docks.com
TOP TRENDS IMPACTING MARINA INFRASTRUCTURES

New Power Capacity

The world started commissioning more gigawatts of clean energy than fossil fuels from 2015

- Fossil fuels
- Clean energy

Source: S&P Global Market Intelligence World Electric Power Plant Database, Platts

HOW CAN MARINA FACILITIES SERVICE THESE CUSTOMERS...?
TOP TRENDS IMPACTING MARINA INFRASTRUCTURES

ELECTRIC VEHICLES: growing from 3M to **125M by 2030** (IEA forecasts)
- Volvo: all models introduced in 2019 will be either hybrid or all electric
- GM: working toward an all-electric future, at least 18 new models by 2023
- Tesla, Audi, VW, Porsche, Mercedes, Mazda, Ford, Toyota, Hyundai, others already offering electric vehicle models and/or in the works...

ELECTRIC MARINE PROPULSION: hybrid and pure electric boats and ships will rise rapidly to over **$20B worldwide in 2027** (idtechex research)
- Caterpillar, MAN Diesel & Turbo, Mitsubishi Heavy Industries, Rolls-Royce Wartsila, BAE, Torqueedo, OceanVolt, Elco, other new market entrants

HOW CAN MARINA FACILITIES SERVICE THESE CUSTOMERS...?
TOP TRENDS IMPACTING MARINA INFRASTRUCTURES

ELECTRIC VEHICLE CHARGING

ELECTRIC MARINE CHARGING

SERVICING CUSTOMERS & OFFSETTING ELECTRIC COSTS
TOP TRENDS IMPACTING MARINA INFRASTRUCTURES

RENEWABLE POWER: global market is projected to reach $2B+ by 2025, growing at a CAGR of 4.9% from 2017 to 2025 (Allied Market Research)

✓ Less use of fossil fuel power sources = Lower fossil fuel service revenue
✓ Higher customer demand of electricity (E-VESSELS / E-VEHICLES)

➢ HOW CAN MARINA FACILITIES USE INFRASTRUCTURE TO REDUCE ELECTRICITY COST AND SATISFY INCREASED ELECTRIC DEMAND..?

ENERGY STORAGE / RESCILIENCY: extreme weather is causing costly power outages with each passing year (Allianz) / Short blackouts in the US add up to an estimated economic loss of $164B

➢ HOW CAN MARINA FACILITIES PREPARE FOR OPERATIONAL RESCILIENCY?
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OFFSETS ELECTRICAL OPERATING COSTS AND PROVIDES POWER RESILIENCY
## Top Trends Impacting Marina Infrastructures

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- Offsets electrical operating costs and provides power resiliency.
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**Offsets electrical operating costs and provides power resiliency**

**New England Electricity Price Increases 28% in 2018** *(PBN March 12, 2019)*
TOP TRENDS IMPACTING MARINA INFRASTRUCTURES

**SEA POLLUTION & MICRO PLASTICS:** 6.5M tons of litter/yr. (World Ocean Network)

Human health suffers from contamination of coastal water: **250M of clinical cases** gastro-enteritis, respiratory diseases, are caused annually by bathing in contaminated waters.

**IoT REMOTE SENSING & MONITORING:** recent changes in climate and environmental regulations have increased the importance of environmental monitoring making it a highly active research area. (NASA)

**HOW CAN MARINA FACILITIES MANAGE COASTAL POLLUTION AND ENVIRONMENTAL COMPLIANCE...?**
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TRASH SKIMMERS, WATER QUALITY SENSING & IoT REMOTE MONITORING
PREVENTIVE SEA POLLUTION MEASURES
TOP TRENDS IMPACTING MARINA INFRASTRUCTURES

AUTONOMOUS YACHTING / SHIPPING – Ocean Surface Robot Market anticipated to reach **$2.90B by 2028** (16.8% CAGR) and Autonomous Ship Market expected to grow to **$3.48B by 2035** – (BIS Research Report)

- Volvo Penta Unveils Pioneering Self Docking Yacht Technology
- Raymarine DockSense™ Self Docking

- HOW WILL MARINA FACILITIES SERVICE AUTONOMOUS VESSELS…?

SEA LEVEL RISE – Global sea level rise by 2100 projects a range to 2.0 meters (6.6 feet) sea level rise. (NASA)

- HOW CAN MARINA FACILITIES DERISK SEA LEVEL RISE LONGTERM IMPACT...?
### TOP TRENDS IMPACTING MARINA INFRASTRUCTURES

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#### AUTONOMOUS DOCKING SYSTEMS
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AUTONOMUS POWER SYSTEMS / RESILIENT INFRASTRUCTURE
PowerDocks LLC

Aquatic Charging Solutions (sm)

Anthony Baro - PowerDocks LLC
www.power-docks.com
abaro@power-docks.com

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