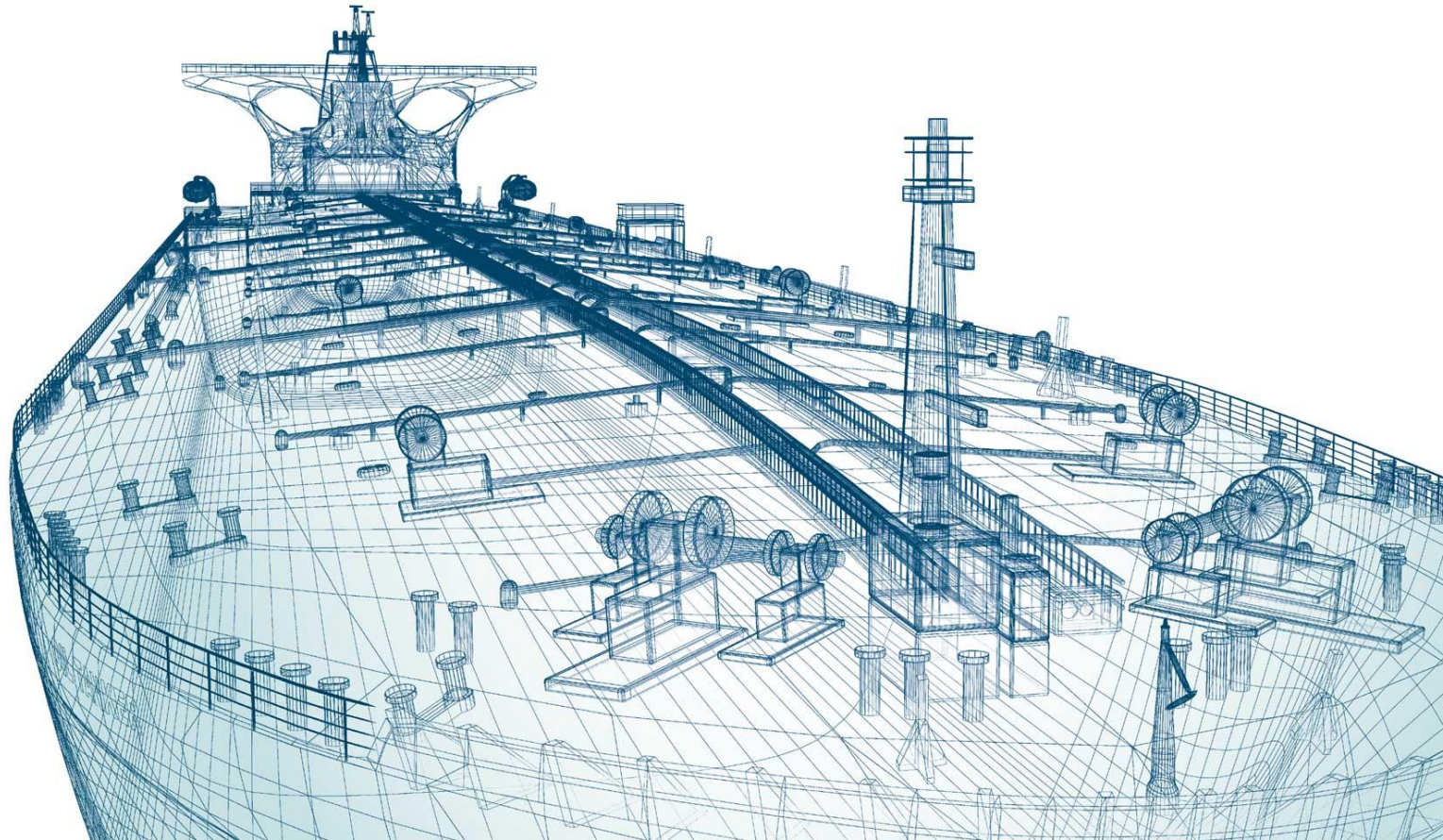




Energy Alternatives: Nailing the Basics

Speaker: Jan Flores, Vice President



Energy Alternatives



Triathlon Basics

- Train
- Eat
- Sleep



Energy Alternative – Why??

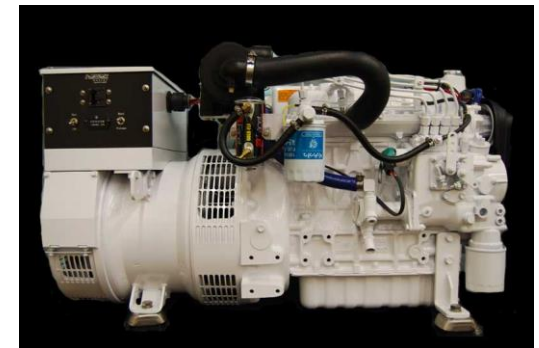
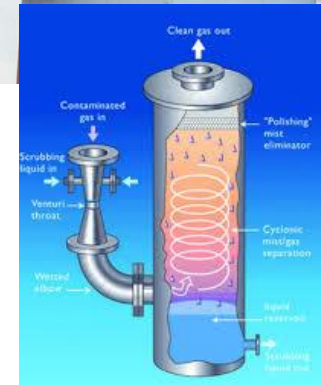
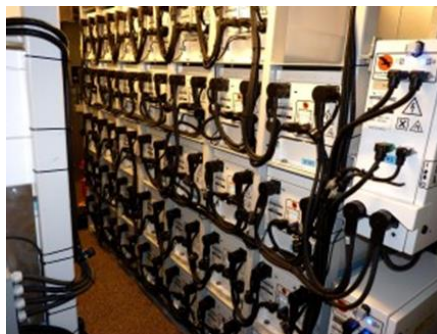
- Environmental Compliance
- Sustainability (\$\$\$)
- Energy (a.k.a Fuel) Availability



Very Efficient Marine Propulsion Train

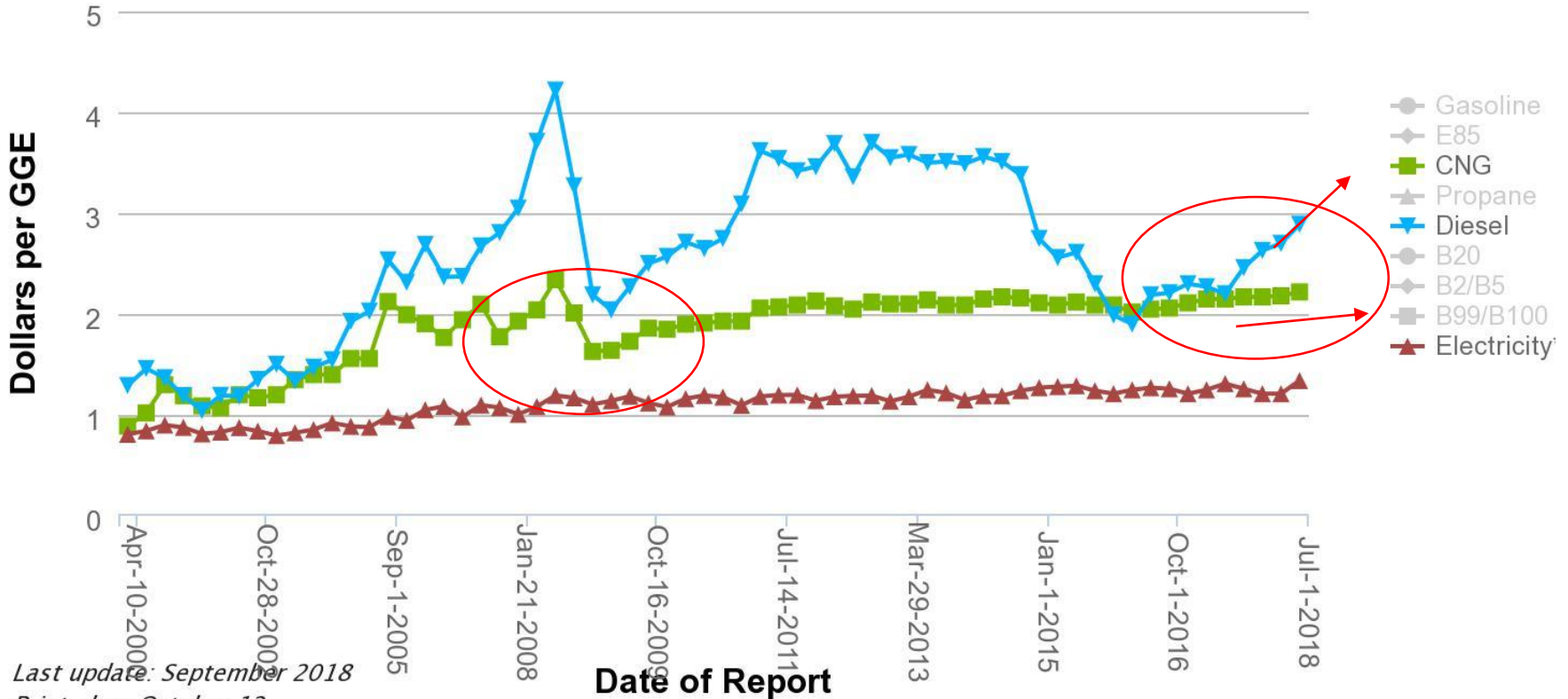


DIRECT
DRIVE



Energy Alternatives

Average Retail Fuel Prices in the U.S.



Last update: September 2018
Printed on October 12

Energy Alternatives

Energy Kind	Why??	Challenges
HFO	Simple (Familiar) Availability	Emissions Price(?) Availability (?)
LNG	Emissions (>SOx) Availability Price (?)	Availability Complexity of Installation & Operation
Methanol	Emissions (>Sox, NOx & PM)	Storage
Batteries	Emissions (0 SOx, NOx, & PM) Opex Price (?)	Storage Capex Price
Fuel Cells	Emissions(0 SOx, NOx, & PM) Opex Price	Fuel Storage Availability



Naval Architecture
& Marine Engineering

Developing
Solutions
for Complex
Maritime
Challenges

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Engineering

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Advanced Engineering
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Conversion, Modification,
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