

LNG Bunkering and Microgrid Development in the US West Coast/Hawaii Trade

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Association of Pacific Ports
Winter Conference

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MV George III Arrival into Honolulu – August 2022



THE PASHA GROUP



SPECIFICATIONS

- Length: 236 meters (774.3 ft.)
- Beam: 35 meters (114.8 ft.)
- Draft: 10.8 meters (35.4 ft.)
- Speed: 23.0 knots
- Deadweight: 43,500 metric tons

CAPACITY

- 2,525 laden TEUs
- 45-ft. container: 500
- 40-ft. reefer container: 400
- 40-ft. container: 300

MV George III is the most hydrodynamically efficient
containership in the world

LNG BUNKERING Port of Long Beach





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Low Carbon Fuel Delivery

West Coast Clean Fuels is building the critical fuel-delivery supply chain bringing low-carbon fuels to the first ever LNG-powered and Hydrogen-powered ships operating on the U.S. West Coast

www.WestCoastCleanFuels.com

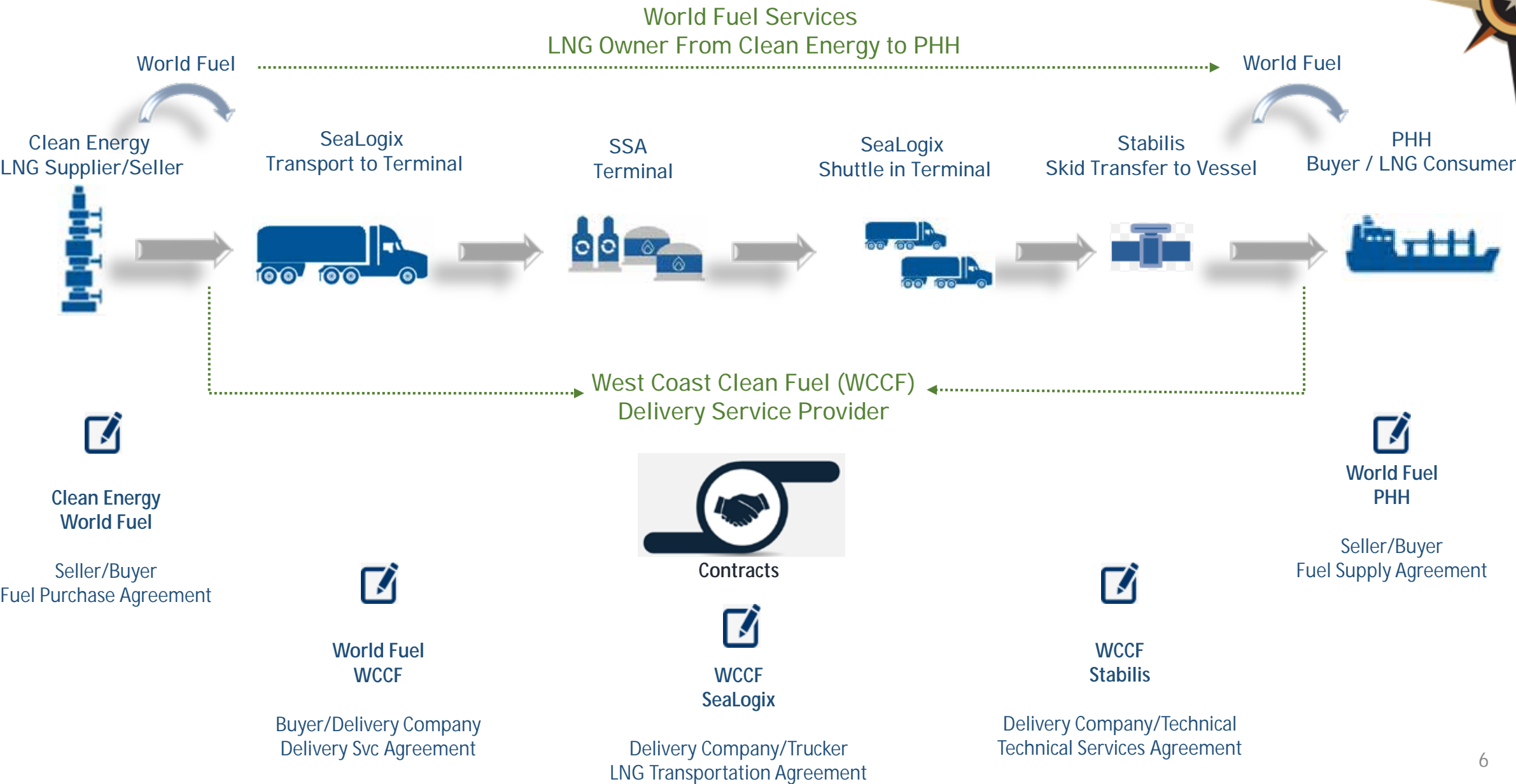
West Coast Clean Fuels Bunkering August 2022 – Port of Long Beach



First Marine LNG bunkering on the US West Coast
337,500 gallons per vessel call
Bunkering operation is less than 8 hours
LNG powered delivery trucks



LNG Fueling Operation



Why LNG?

- § Most dramatic positive effect to port community health of all commercially available high horsepower fuels
- § Eliminates pollutants PM and SOx 99.9%
- § Substantially reduces GHG, NOx 90% CO2 25%
- § LNG is a fuel in transition-grey to green
- § A clear path to carbon neutral shipping (2050 IMO requirements)
- § Bio LNG can be carbon negative



MICROGRID

Wilmington CA

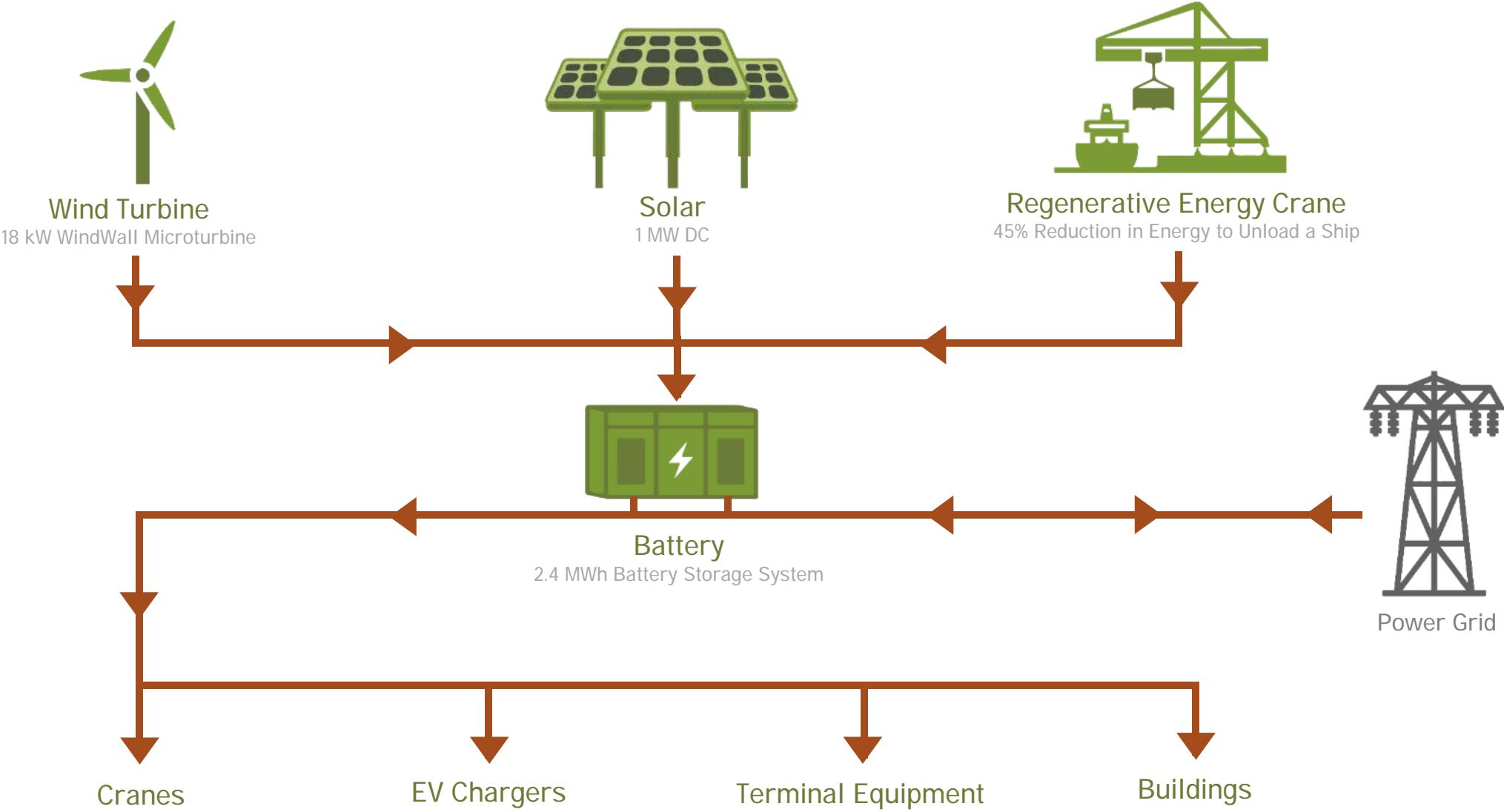


PORT MICROGRID

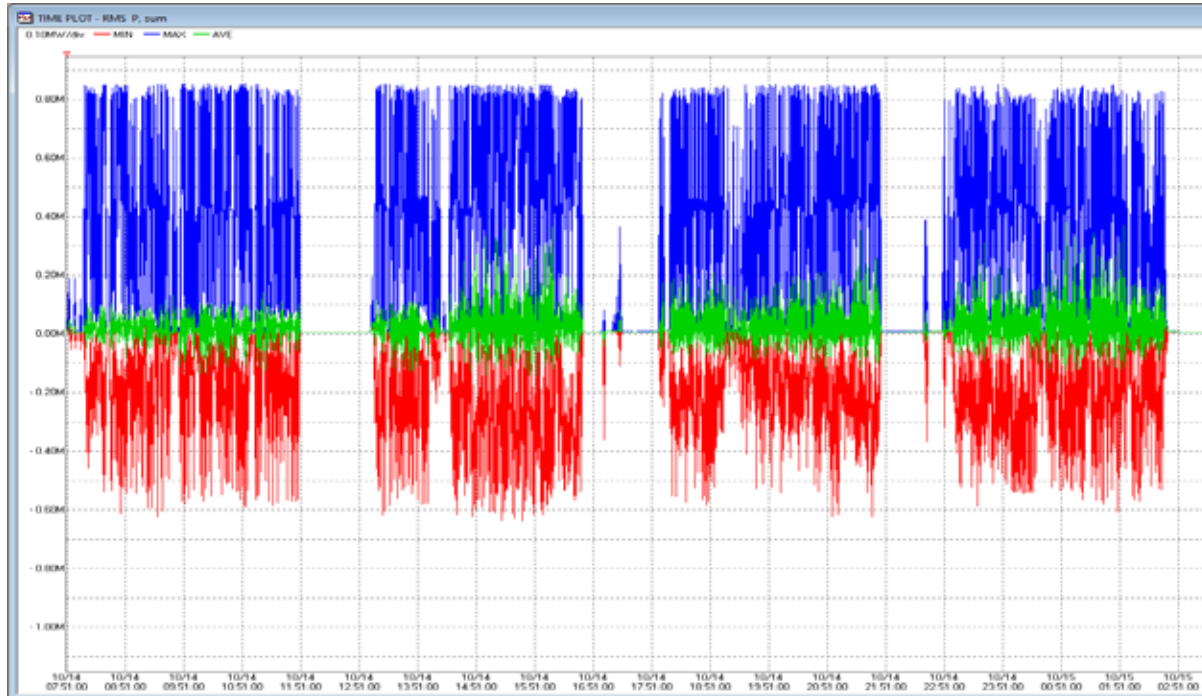
MARAD/META/PIDP PORT ALTERNATIVE ENERGY DEMONSTRATION PROJECT FOR POWERING MICROGRIDS



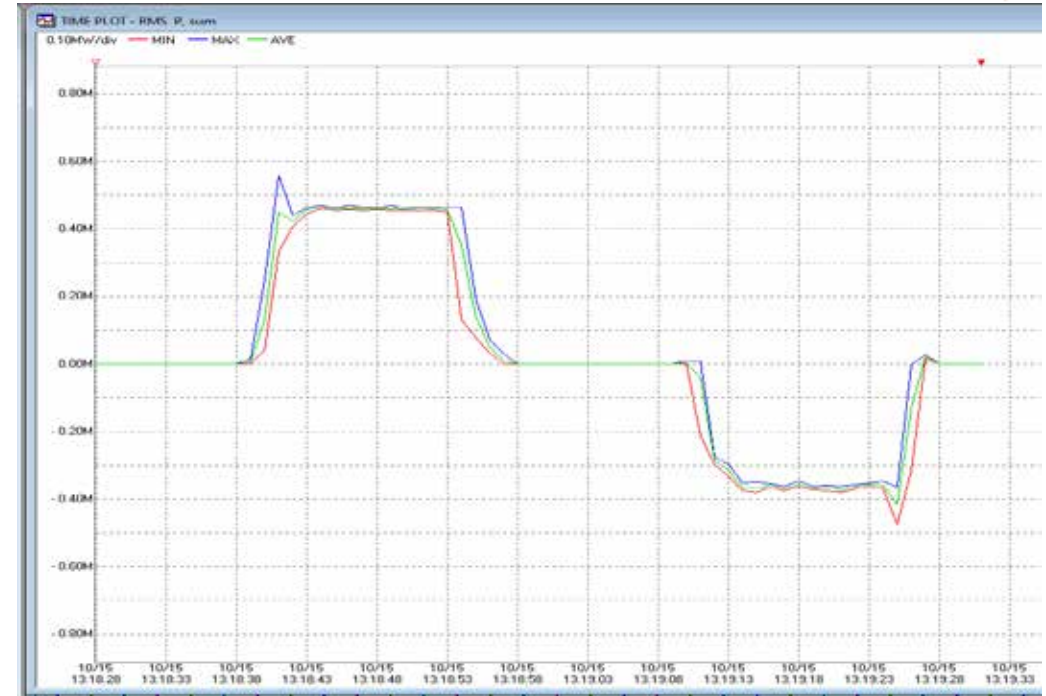
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Crane Energy and Regeneration During Ship Unload



- Blue is energy supplied to crane
- Red is crane regen energy supplied back to grid
- Green is average power
- Crane regen reduces the energy consumption by 45%



- Crane energy consumption and regen to lift 82,000 lbs up and then lower back down
- Hoist power was 460 kW
- Regen power was 360 kW
- Cycle is 78% efficient

WindWall: Pasha Energy Services



THE PASHA GROUP



6' person



100kW
225.02 ft²



100kW
2,252 ft²



100kW
22,522 ft²

American Wind produces 444.4 w/ft²
Conventional Wind produces 44.4 w/ft²
Solar produces 4.44 w/ft²

Battery Energy Storage System (BESS)



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Each BESS has 1.2 MWh energy storage with a max output of 500kVA,
480 VAC Three Phase Lithium Ion

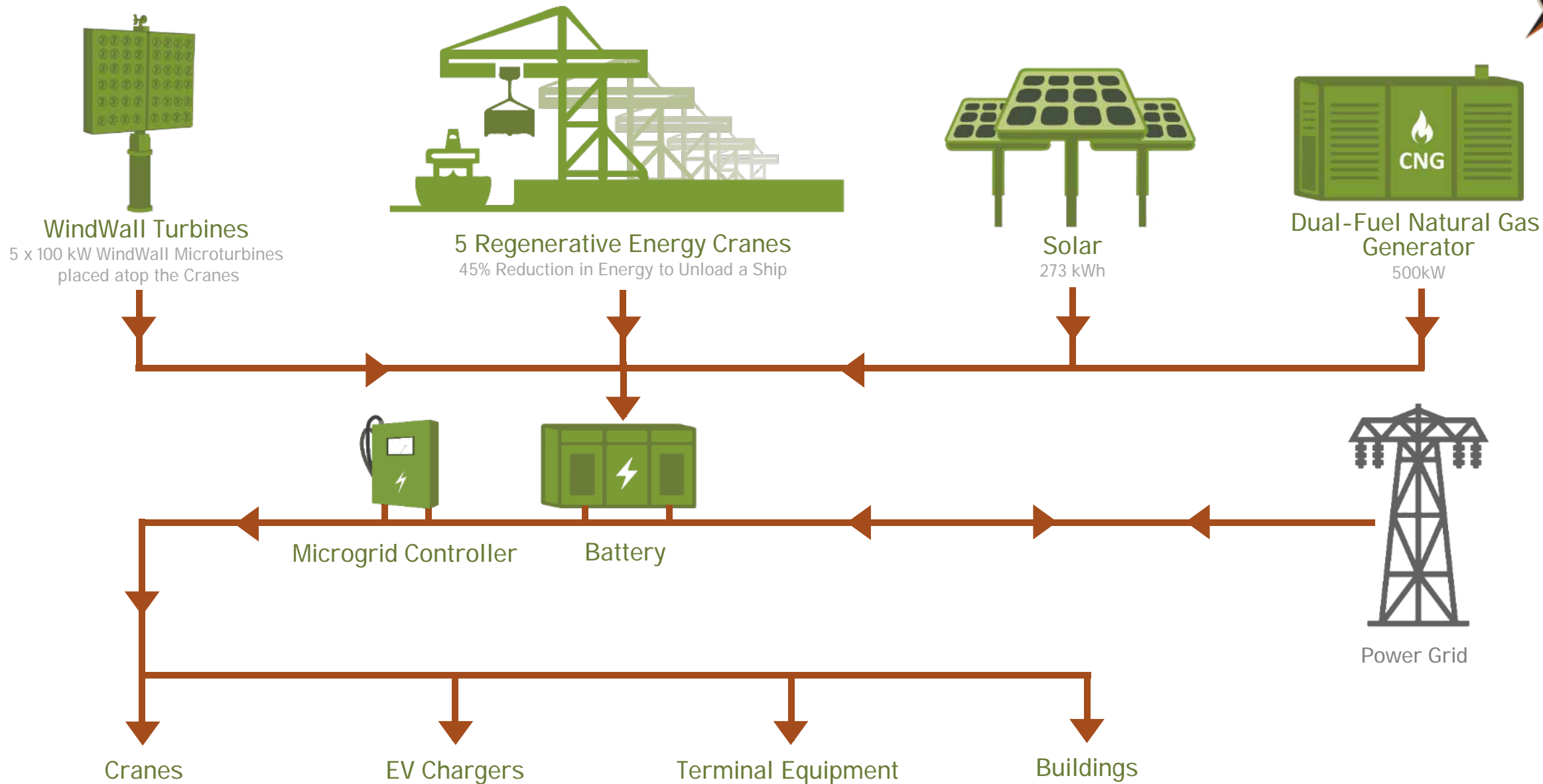
MICROGRID KAPALAMA CONTAINER TERMINAL



KAPALAMA CONTAINER TERMINAL MICROGRID



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KAPALAMA CONTAINER TERMINAL MICROGRID



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MAHALO

