ENERGY-SAVINGS INITIATIVES

We are continuously investing in a broad range of voluntary energy reduction initiatives that meet or surpass the requirements of current laws and regulations. Reducing fuel and driving energy efficiency takes multi-million-dollar investments and a multi-pronged strategy. Below is a list of some of the initiatives we are working on:

**DESIGNING SHIPS FOR GREATER EFFICIENCY**
- Optimize hull design to minimize drag.
- Select fuel-efficient combustion equipment.
- Install equipment such as steam turbines to use waste heat.
- Install energy-efficient onboard equipment, including lighting.

**INCREASING EFFICIENCY THROUGH SHIP OPERATIONS AND MAINTENANCE**
- Optimize diesel generator use at sea and in port.
- Manage use of evaporators and reverse osmosis plants.
- Use LED lighting.
- Utilize sophisticated control systems for heating ventilation and air-conditioning (HVAC).
- Monitor and improve chiller performance.
- Apply state-of-the-art anti-fouling marine hull coatings.
- Clean propellers and hulls regularly.
- Reduce energy consumption.
- Increase use of waste heat from engine exhaust for fresh water production and steam generation.
- Use on-demand methodology for galley ventilation control.

**MINIMIZING FUEL USE AND ENGINE EMISSIONS**
- Examine ways to increase energy efficiency through fuel homogenizers, which improve combustion and reduce fuel consumption.
- Optimize the use of diesel generators onboard to improve efficiency.
- Use waste heat generated by the ships’ engines to make steam instead of relying on the ships’ boilers.
- Reduce the power required by engine room ventilation fans, through use of variable-frequency fan-drive motors and related pressure and temperature control systems.

**IMPLEMENTING OTHER ENERGY-SAVING INITIATIVES**
- Design more fuel-efficient itineraries.
- Use voyage optimization tools.
- Increase energy use awareness through education and training of guests and crew.
- Develop our ability to use alternative fuels.
- Research and developing emissions-reduction technologies.
- Incorporate an innovative "Air Lubrication System," which creates bubbles between the ship’s hull and water to reduce friction.

**MINIMIZING ENGINE EMISSIONS**
- Use Cold Ironing or Plug-In while in port.
- Install Advanced Air Quality Systems.
- Use alternative fuels like Liquefied Natural Gas (LNG).