Harnessing the Wind.

The recent dispute between Russia and a neighbour, resulting in the disruption of gas supplies to several European countries, has, once again, concentrated minds on the problems of ensuring the uninterrupted supply of energy sources – principally oil and gas. The continuing conflict in Iraq, anti-Western feeling in Venezuela, Iran and elsewhere and the kidnapping of oil workers in West Africa are but some of the factors contributing to this anxiety.

Some years ago a study indicated that 60% of all oil reserves were contained within areas of political instability and, since that time, the situation has deteriorated. The consequences of a prolonged disruption to the supply of crude oil or gas would be catastrophic – and nowhere more so than in the global shipping industry.

Over the years much thought has been given to finding other sources of power and a return to coal fired steam boilers is undoubtedly the most obvious solution. Environmentalists will greet this with dismay and, in any case, it is doubtful if coal burners would be tolerated in many ports of the world. Nuclear power is NOT an option.

Almost 100 years ago the Royal Navy replaced the steam reciprocating engines of HMS Rattler with gas engines (and gas producers) and these proved to be extremely efficient – and allowed for a significant reduction in engine room manning. The gas producers were fuelled by anthracite and their gaseous product (used in a modified engine) replaced the liquid oil fuel used previously. Much later, in 1942 a Swedish coaster installed wood-fired gas producers but a Danish shipyard opted for the use of coal.

Perhaps Doctor Diesel – the inventor of the diesel engine – had a premonition about a shortage of crude oil because he was the man who first suggested the use of pulverised coal dust as a fuel for his compression ignition engine. Such an engine was produced in Britain and, although extremely promising in terms of economy and power output, the concept died in the late 40's.

Since man first ventured upon the water the concept of using the wind to afford propulsion has developed continuously and today this development has taken on a new emphasis. "Wind power" had one great disadvantage – the recipient usually had to travel, more or less, in the "direction" of the wind and it was this that concentrated minds on the need to find some way of enabling the user to travel into wind –and to be able to manoeuvre for navigational and collision-avoidance reasons.
Early studies concentrated on a wind powered rotating device that would, by gearing, transmit its power into propulsive power. In the early 1800's one Robert Dawson came up with such an idea but his technical submission (to King George the Third) probably bewildered His Majesty as much as it does those who read it today.

Later that century a 2 ton yawl equipped with various sails and "a windmill driving a waterscrew propeller" successfully crossed the Atlantic. Preparing for any eventuality, her two man crew had ensured that in the event of a lack of wind her screw propeller "could be turned by hand" but history does not relate if this means of propulsion (?) was adopted!
As the years passed designs improved and concentrated on various concepts of propulsion. Germany probably led the way with the "Dynaschiffe" and the ugly Flettner rotor ship (financed by the German Navy) whilst elsewhere the rigid wingsail and windmill design took priority. It was claimed that in gale force conditions a 20,000 ship could achieve a speed of 13 knots using either of these.

In 1984 I was invited onboard the Everard coasting vessel "Ashington" in Southampton where she was being fitted with the "Walker Wingsail System" – proven and tested at Cambridge University. She had been fitted with two freely rotating wingsail units on rigid mountings. The notes I made at the time recorded that the units were "in a triplane configuration and trimmed to the most advantageous angle in relation to the wind by the use of a fin without regard to minor alterations in the direction of the ships head" I hasten to explain that we were being addressed by an expert! Subsequent reports indicated that the scheme was a very great success and that significant fuel economies had been achieved – but it all went quiet!

"Ashington" fitted with the Walker Wing-Sail

Modern thinking appears to concentrate on the same idea of harnessing wind power, used in tandem with more conventional methods of propulsion, to achieve economies in fuel and reduce funnel emissions.
Today, fuel costs represent some 60% of the operational costs of a commercial vessel – and more and more countries are seeking ways to reduce damage to the environment by funnel gases - so the search for "wind assisted propulsion" is unlikely to decrease.

Undoubtedly, the most interesting development – German again – relates to the use of "a high-tech kite flying at an altitude of up to 500 meters where winds are more stable than at sea level" and the makers claim a 50% reduction in the fuel consumption of this "hybrid sailing ship". They also claim a 10% increase in speed. At least one "kite flying" ship is trading successfully and there are plans for more.
In Denmark, a company of naval architects is improving the design of its 1995 windship and claim that it will be profitable, both environmentally and economically, to build it. Japan is entering the arena and they – like the Danes – stress that it is not just the price of oil that legislates in favour of the windship. By minimising the amount of machinery space, cargo space can be maximised.

The race is on and the winner will be anyone's guess – but this time the concept of harnessing the wind to assist in the propulsion of commercial vessels is unlikely to die.

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