



German Society for Maritime Technology
Schiffbautechnische Gesellschaft e.V. (STG)

WITT&SOHN
IGW Ventilatoren

Energy efficient engine room ventilation

September 2009

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***Take control of your
energy bill!***

**High efficiency
engine room fans**



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Energy Efficient Engine Room Ventilation

- Fan selection strategy
- Saving potential
- Retrofit
- Recommended measures





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Energy Efficient Engine Room Ventilation

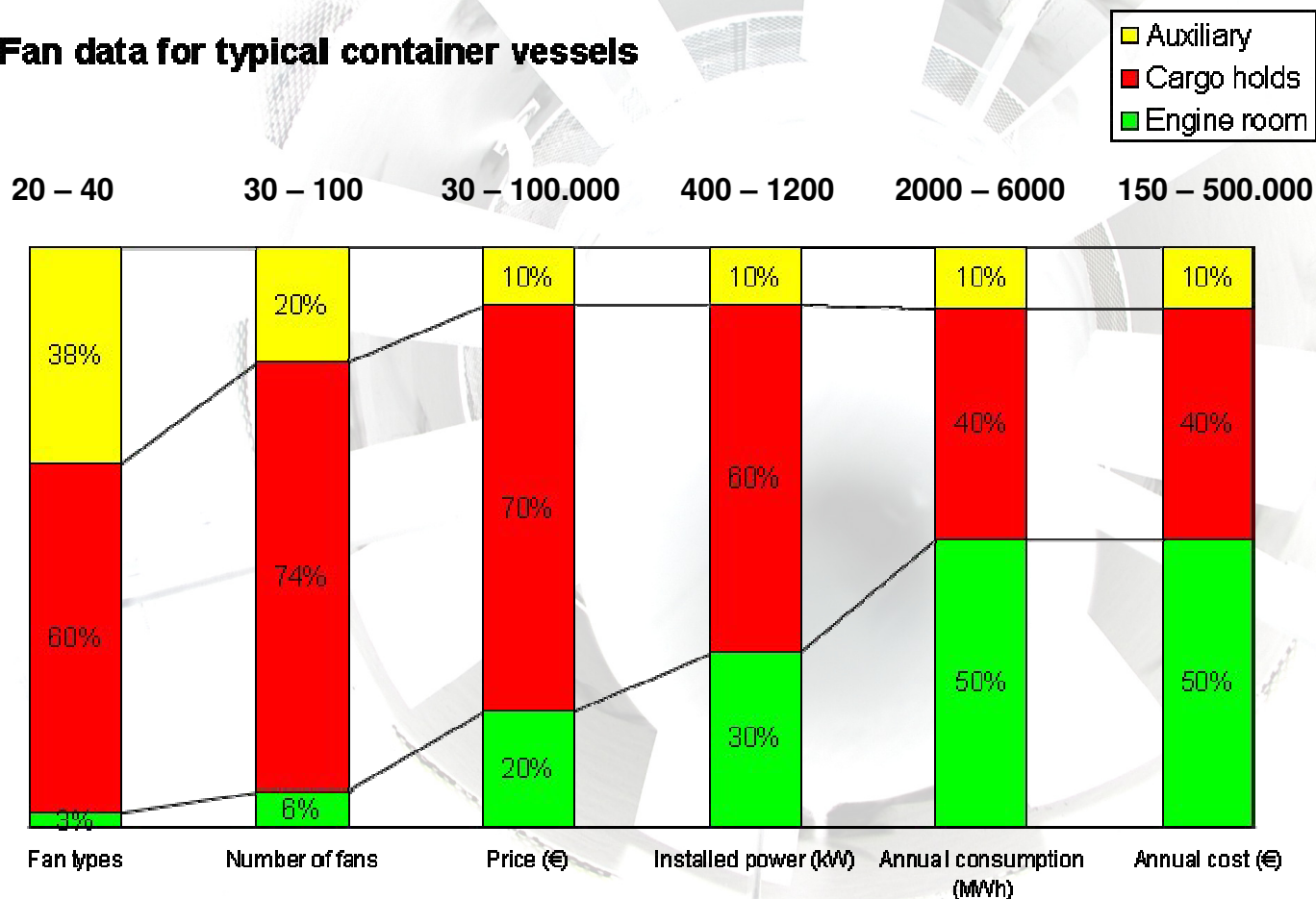
Fan selection strategy





Engine room fans are large energy consumers

Fan data for typical container vessels





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Saving potential



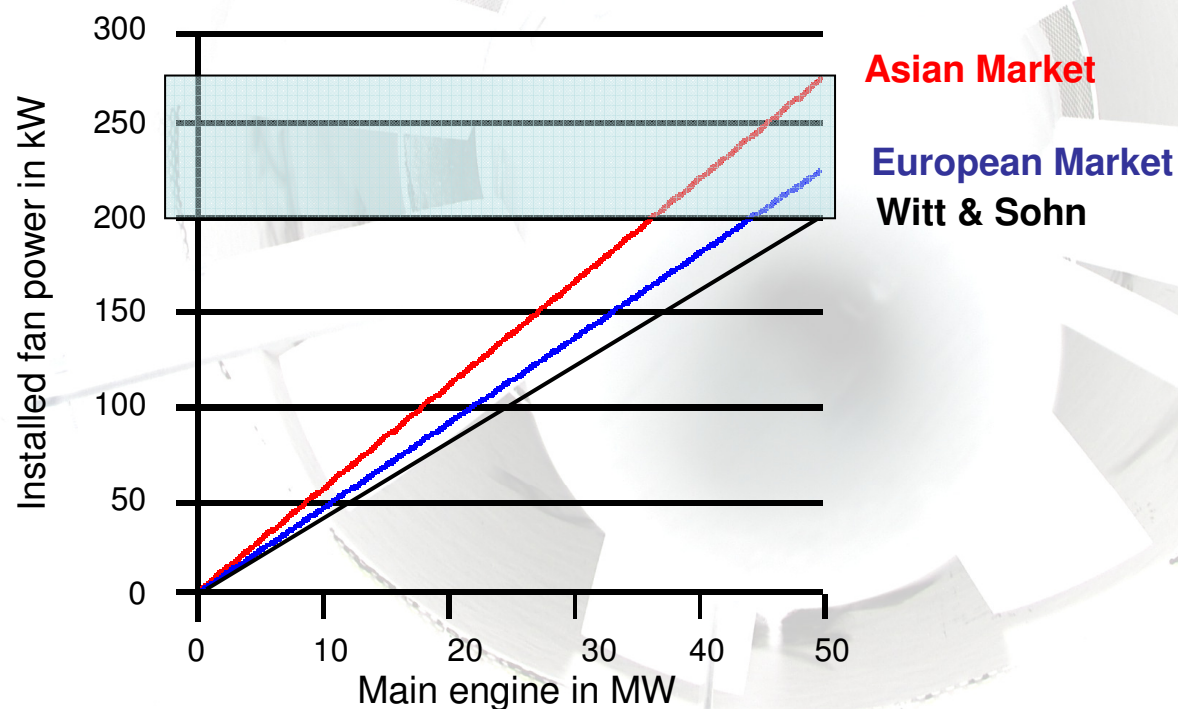


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Engine room fans generate significant operating costs

Installed engine room fan power as a function of main engine size




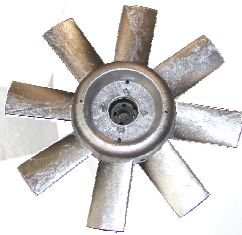
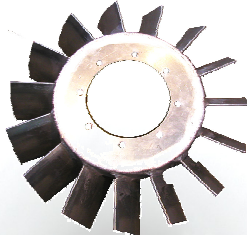
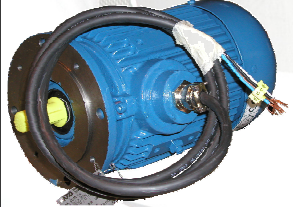



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The Witt fan is designed to achieve optimal efficiency

Some special design elements of the Witt engine room fans

Component	Blade	Impeller	Guide vane	Motor	Casing
Typical Witt & Sohn design					
Energy efficiency design elements	Steel bolt instead of aluminium make aerodynamically optimized blade profile possible	Elliptical hub reduces turbulence	Blade shape maximises dynamic pressure regain	No losses from a terminal box or motor feet High efficiency motors	Optimal bell mouth reduces dynamic pressure losses



Engine Room Ventilation Systems are in general suboptimal

- Fan efficiency too low → Improvement of at least 20%**
- Motor efficiency too low → Improvement of at least 15%
- Filter / Duct Systems with large losses → Improvement of at least 20%
- Air volume is not load adjusted → Improvement of at least 30%*

* Acc. to frequency converter manufacturers an improvement of 60% is actually achievable for single speed motors

** Average efficiency of East Asian fans 60%, European fans 70%, WITT & SOHN AG fans 85%

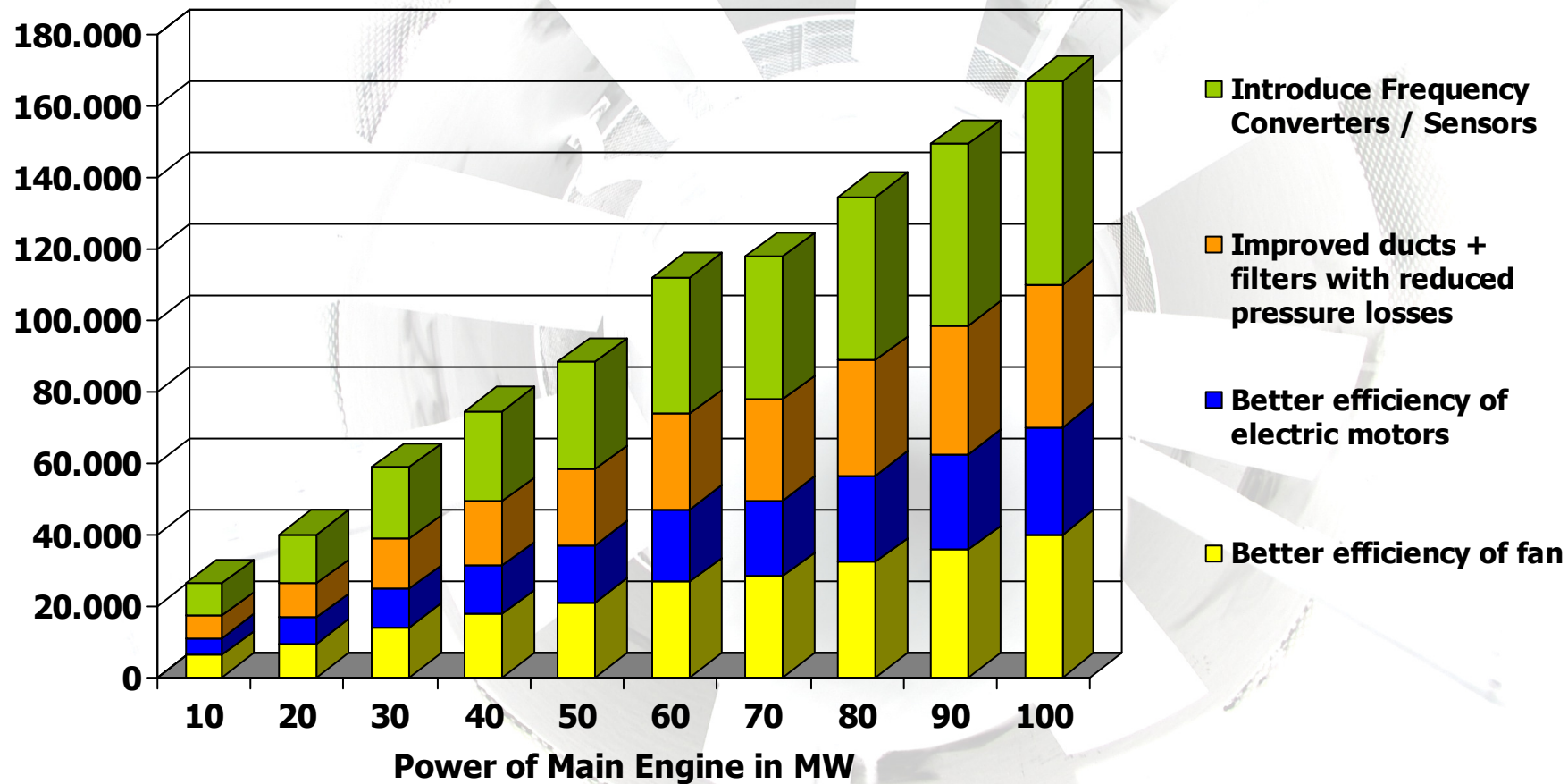


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The savings are easily quantified....

Total savings in € / year

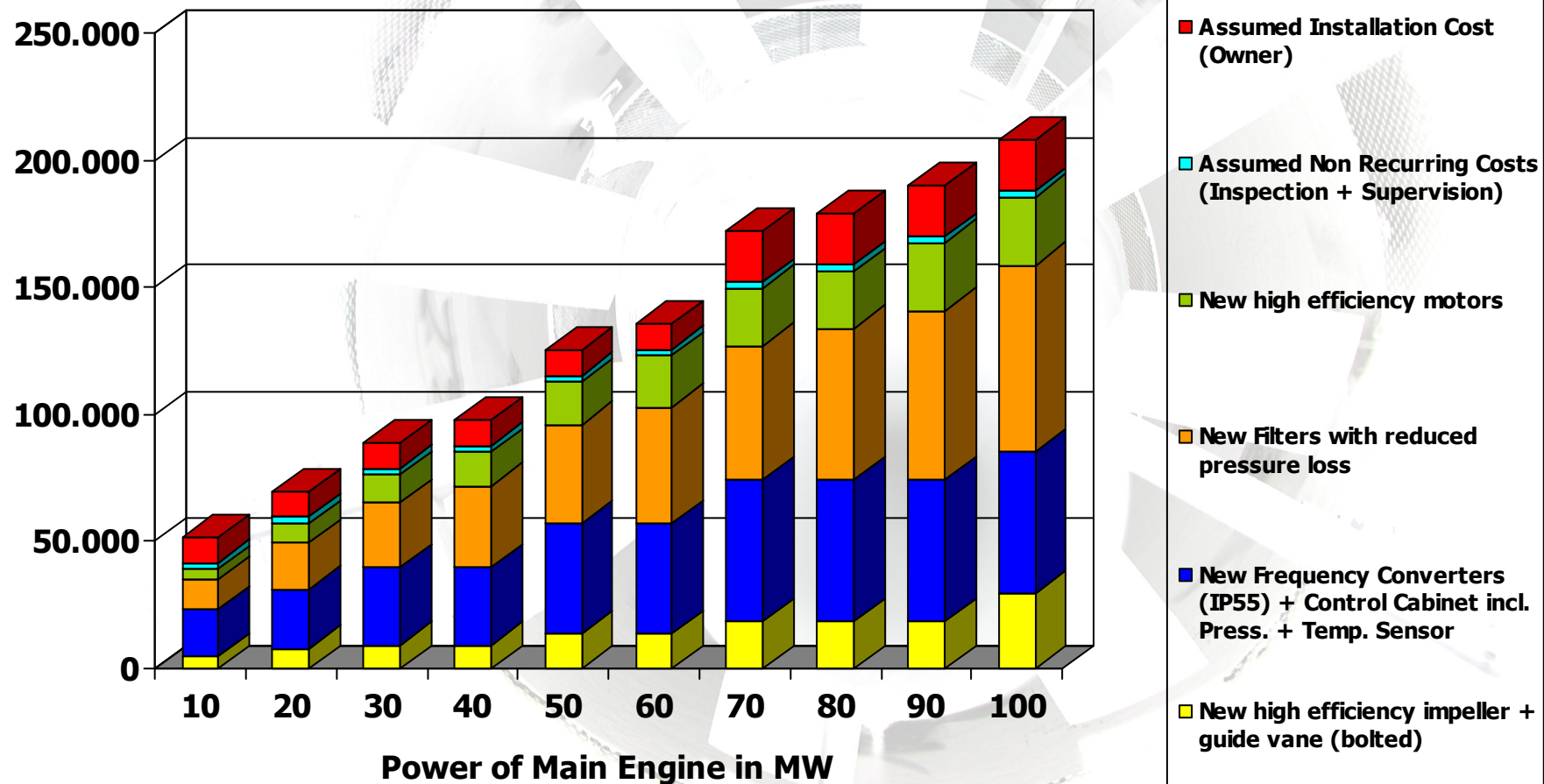


Assumption: Operating hours 8000 per year, Energy cost 0,1 € / KWh, based on actual cases



...and the cost are of the same order of magnitude

Investments in €



Basis: Actual prices december `08, excl. VAT

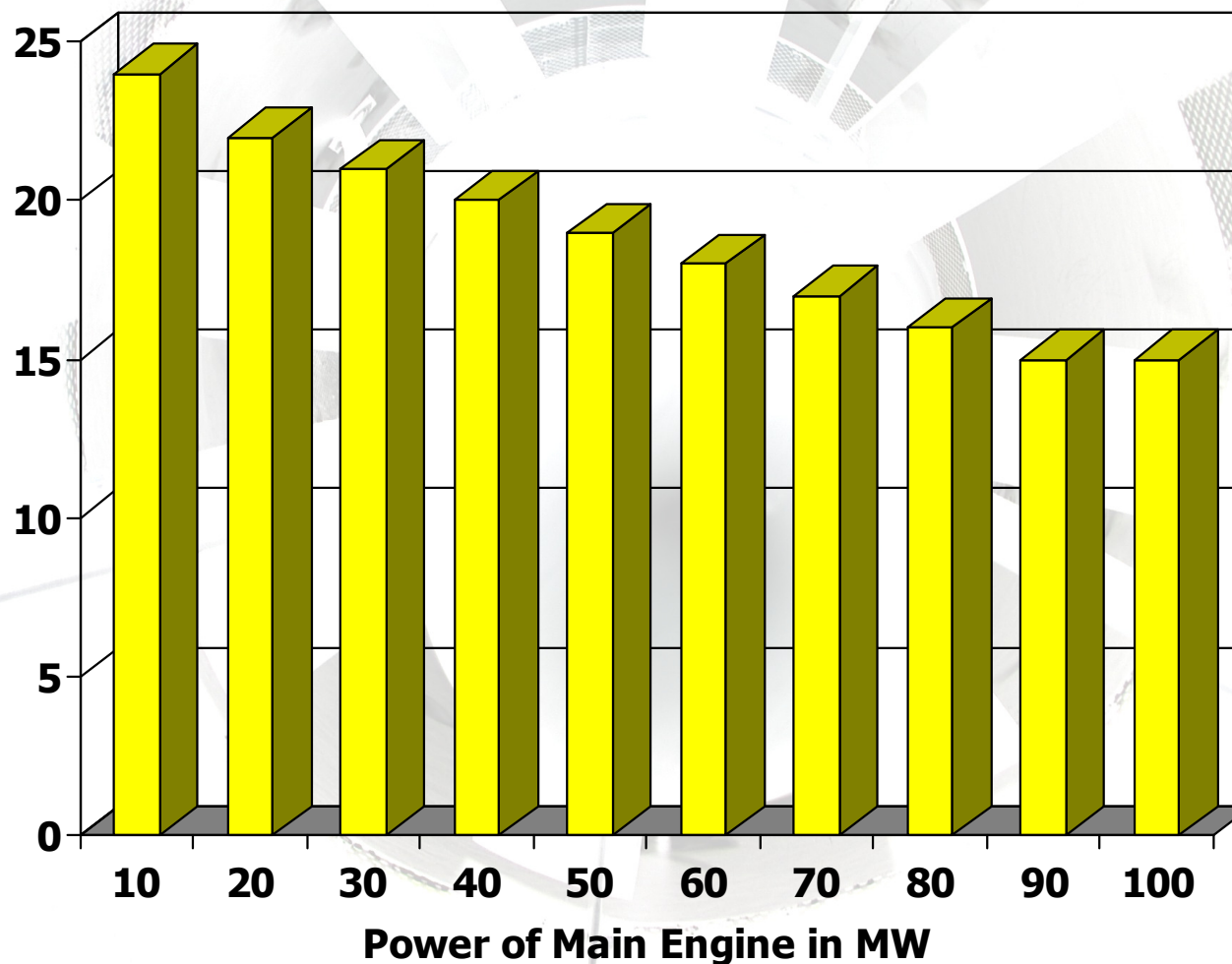


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Payback time is less then 2 years

Payback time in month (approx.)





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Retrofit





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3 easy steps for implementation

- Verifying of the data on board (1/2 day)
- Pre-manufacturing of the components
- Installation on board (approx. 1 day per fan)
 - Replace the impellers, guide vanes (bolted into the casing) and motors. The components can be delivered preassembled.
 - Install the frequency converters and the control cabinet with the sensors (inside the engine room).
 - Install new filters with lower pressure loss which fit into the existing filter frames.

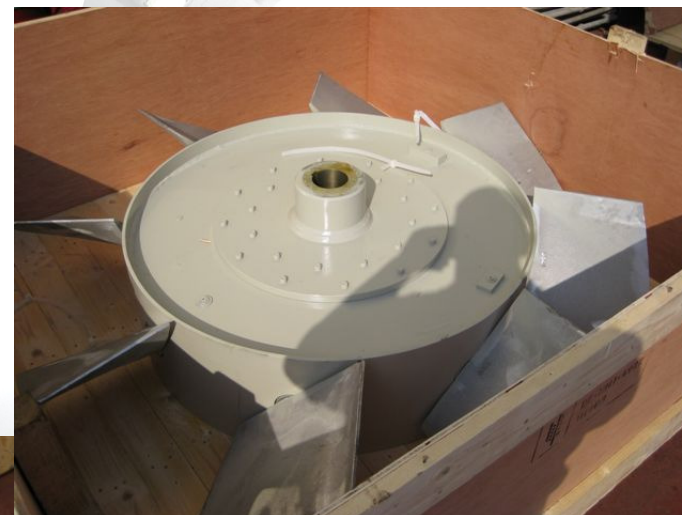


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3 easy steps for implementation

- Pre-manufacturing of components





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3 easy steps for implementation

- Installation on board (Removing existing equipment)





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3 easy steps for implementation

- Installation on board (Installing new equipment)





Summary

- Most installed engine room systems are suboptimal.
- Replacement / Optimization payback is less than 2 years (**Witt & Sohn guarantee!**).
- An additional benefit is a major CO₂ reduction of 240 tons to 1.520 tons per year depending on main engine size.
- Straight forward implementation. Onboard crew, under supervision, can carry it out by themselves.



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A few simple steps can make sure that your future energy bill is kept to a minimum

- Step 1 Insist in the specification on minimum 80 % fan efficiency for the engine room fans. Penalty typically € 1.000 / kW. This is standard for specification for power plants, incinerators etc.
- Step 2 Make sure **Witt & Sohn** is on the makers list. (or ask for one of our licence partners).
- Step 3 Demand a third party verified (e.g. BV, GL, DuV, TÜV, etc.) performance test for the fans as part of the factory acceptance procedure and as part of the fan documentation. Do not accept a non verified efficiency test. „Paper is patient“.



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Suggested wording for the specification:

Engine room fans must have a total fan efficiency of more than 80% measured according to ISO 5801, witnessed and certified by the classification society.

The motors must be high efficiency motors with an efficiency of no less than 90 %.

Thank you for your attention