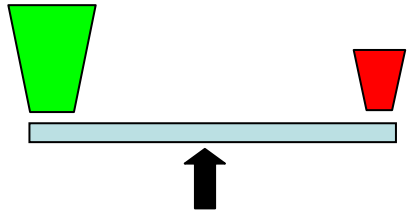
Energy efficient engine room fans

Take control of your energy bill

Using high efficiency engine room fans

Why use energy efficient engine room fans?



- **Environmental Passport e.g. from GL**
- **Reduction in CO2 emission**
- **Reduction of dynamic pressure and noise level**
- **Actual cost of fuel oil is appr. 600 US$/ ton and rising in July 2008 we had a peak of > 900 US$**
- **Realize the saving potential for end-user, 25-150 T€ p.a.**

- **There is a lack of space on board, expensive**
- **Cost for (new) design, no change of standard**
- **Only a charter fleet, no lifecycle cost (budget)**

The electrical energy cost of marine fans are quite high

Estimated energy cost for different types of vessels

Estimate

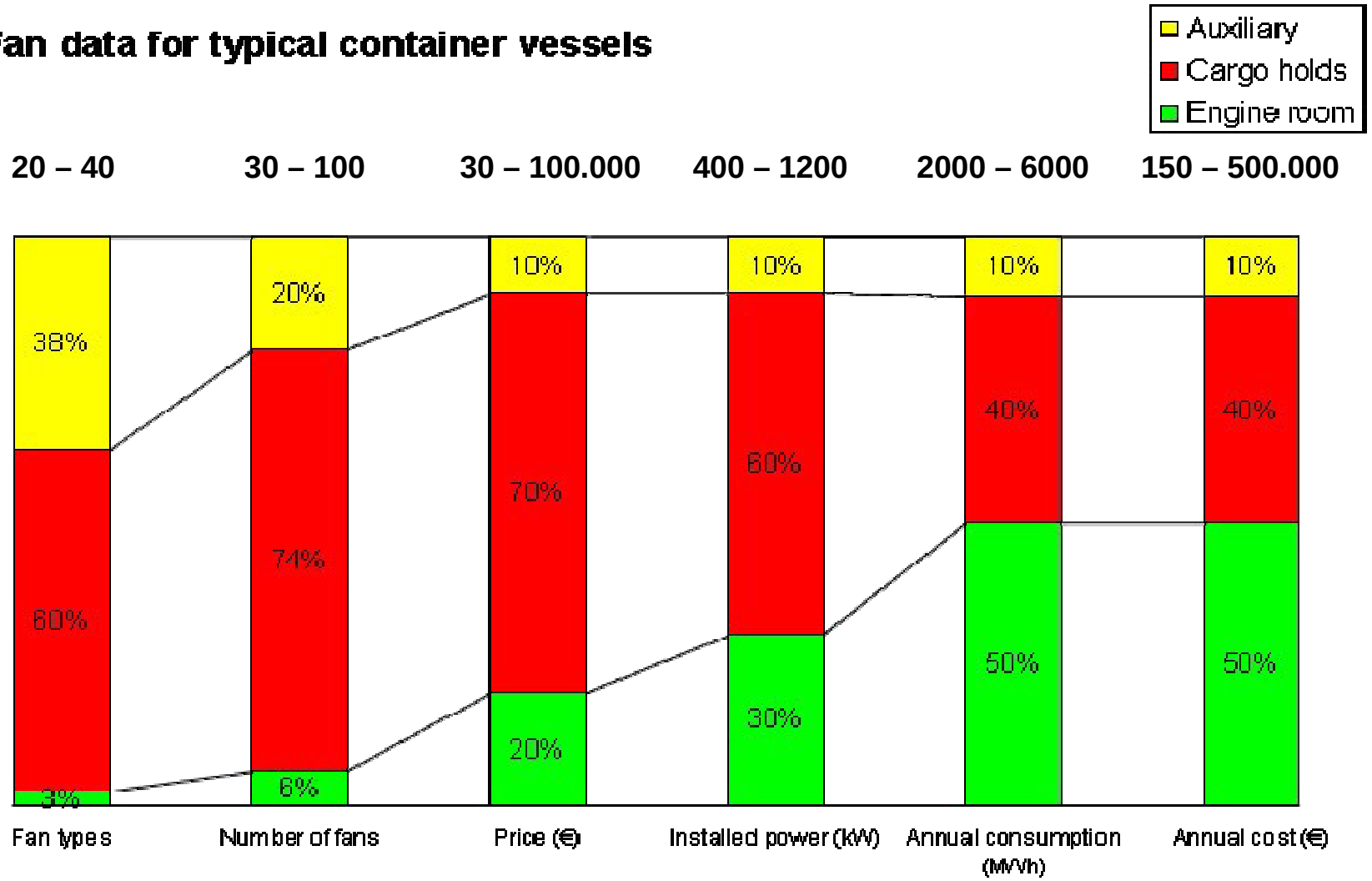
Ship type	Installed fan power	Operating cost**
	In kW	**in € per year**
Coastal freighter	50 – 300	28.000 – 168.000
Naval frigate	150 – 250	84.000 – 140.000
Tanker	200 – 400	112.000 – 224.000
Cattle carrier	200 – 1000	112.000 – 560.000
Container vessel	400 – 1200	224.000 – 672.000
Cruise ship*	200 – 500	112.000 – 280.000

* Without air conditioning

** Assumed operating 8000 hours/ year; 0,07 €/kWh

Source: Witt & Sohn AG analysis, customer interviews

Engine room fans are large energy consumers

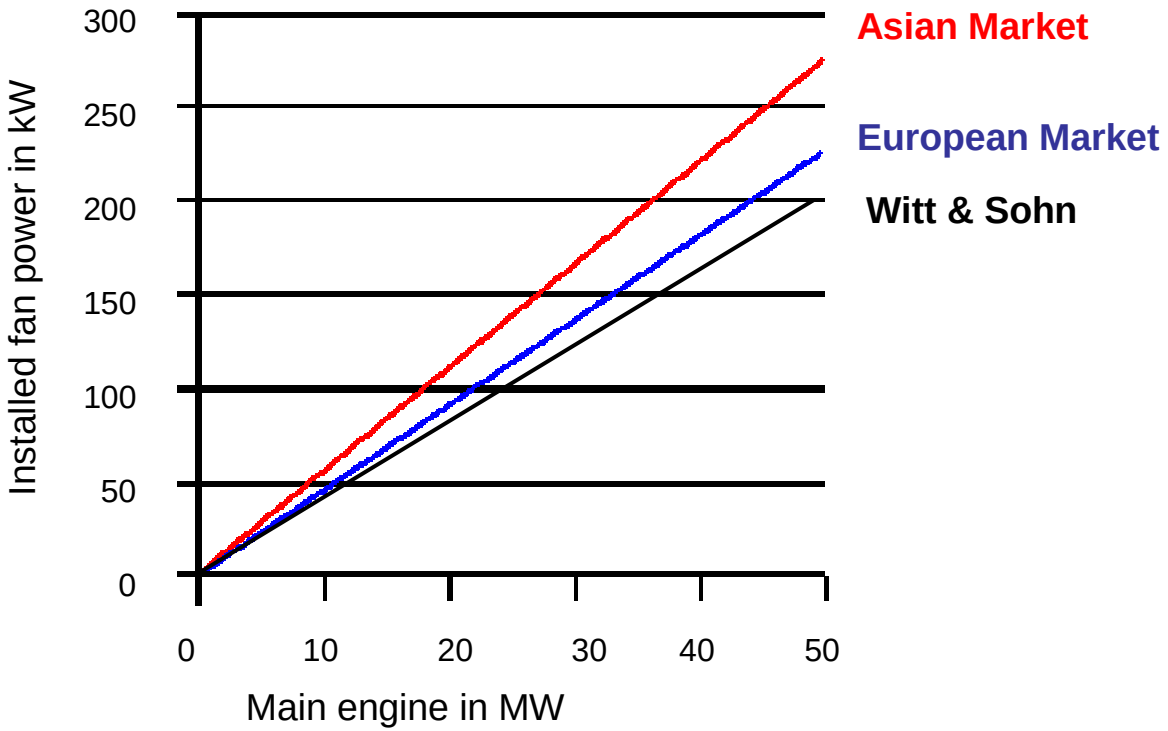


Source: Witt & Sohn AG

*Assuming € 0,07 / kWh (incl. Installation cost / generator etc.)

Engine room fans generate significant operating costs

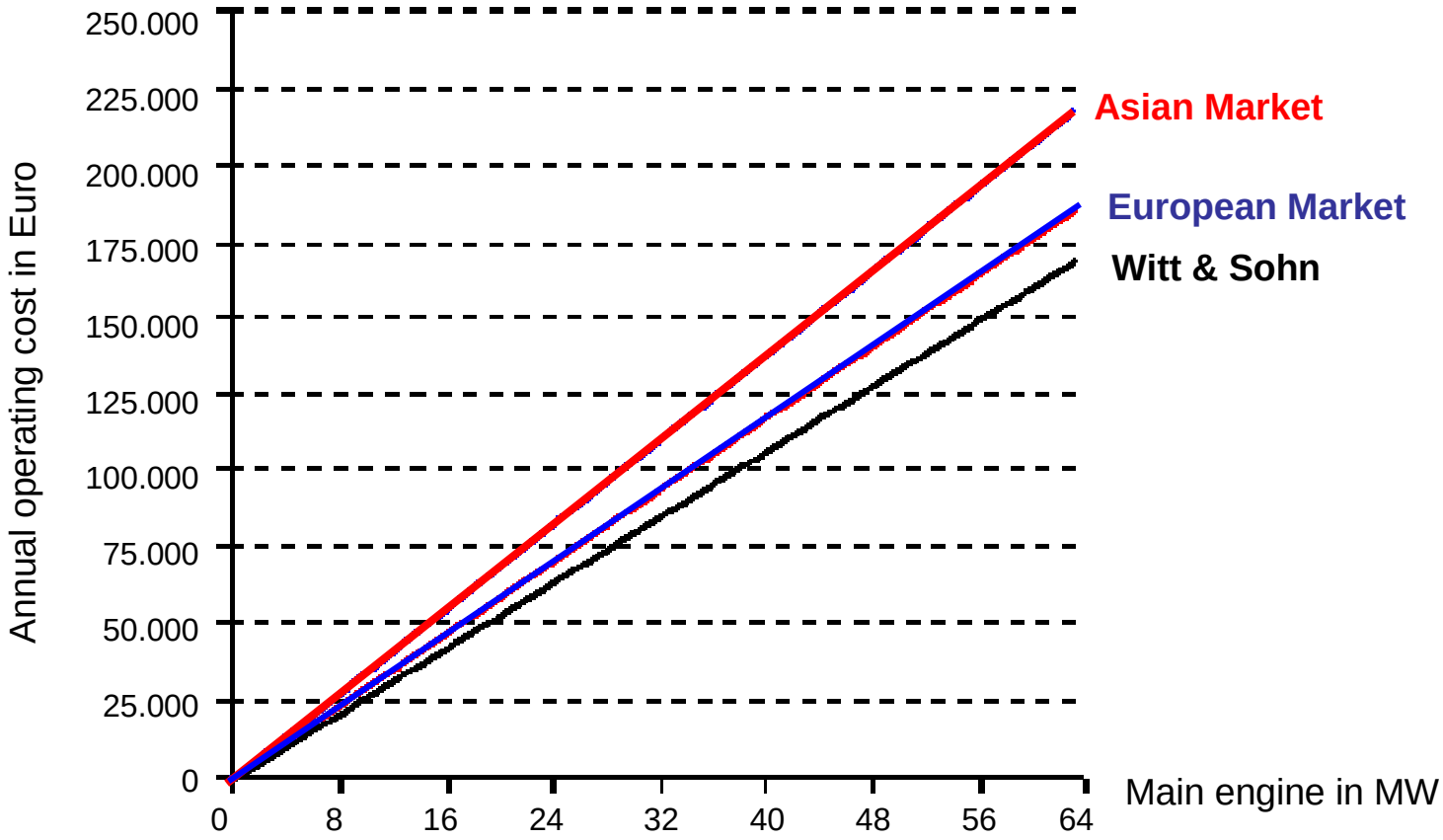
Installed engine room fan power as a function of main engine size



*Assuming 8.000 operating hours and € 0,07 / kWh (incl. Installation cost / generator etc.)

Source: Witt & Sohn AG

The fan price is small compared to the annual operating cost

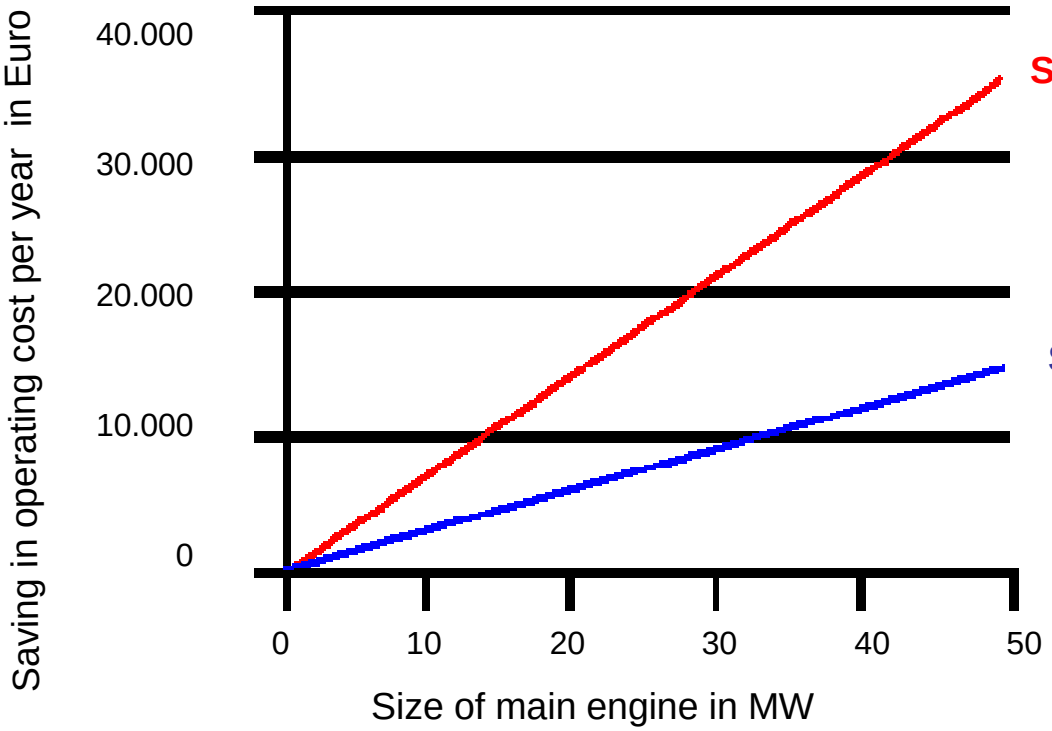


Fan price from	6.000	7.500	15.000	20.000	25.000
to	11.000	17.500	30.000	40.000	50.000

*Assuming 8.000 operating hours and € 0,07 / kWh (incl. Installation cost / generator etc.)

Source: Witt & Sohn AG

The payback from investing in Witt fans is less than 1 year



Assumptions:
- 8.000 hours per year
- 0,07 € / kWh

Maximum price difference to Witt & Sohn fans in €

From	2.500	5.000	7.500	10.000	15.000
to	5.000	10.000	15.000	20.000	25.000

Source: Witt & Sohn AG

Operating cost - another point of view:

15 – 35 T€ saving potential p.a., on av. 25 T€

Actual orders on hand in April 2006 / record level of: 5.040 Ships !
Order value $ 232 Billion / capacity of 3.5 years

If we would realize this saving potential for each 10th vessel, we would have a saving p.a. of 504 x 25.000 € = 12,6 Mio € or during the whole lifetime of 20 years in total **appr. 252 Mio Euro** !

10 € - bills of this sum joined together:
appr. 3200 km
Distance of Hamburg – Marseille and back!

The Witt fan is designed to achieve optimal efficiency

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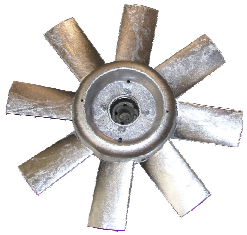
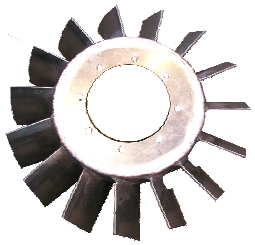
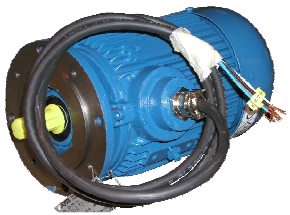
Some special design elements of the Witt engine room fans

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 - Noise reduction design	- No losses from a terminal box or motor feet - High efficiency motors	Optimal bell mouth reduces dynamic pressure losses

In general Witt & Sohn achieves 10 – 20 % higher total efficiency

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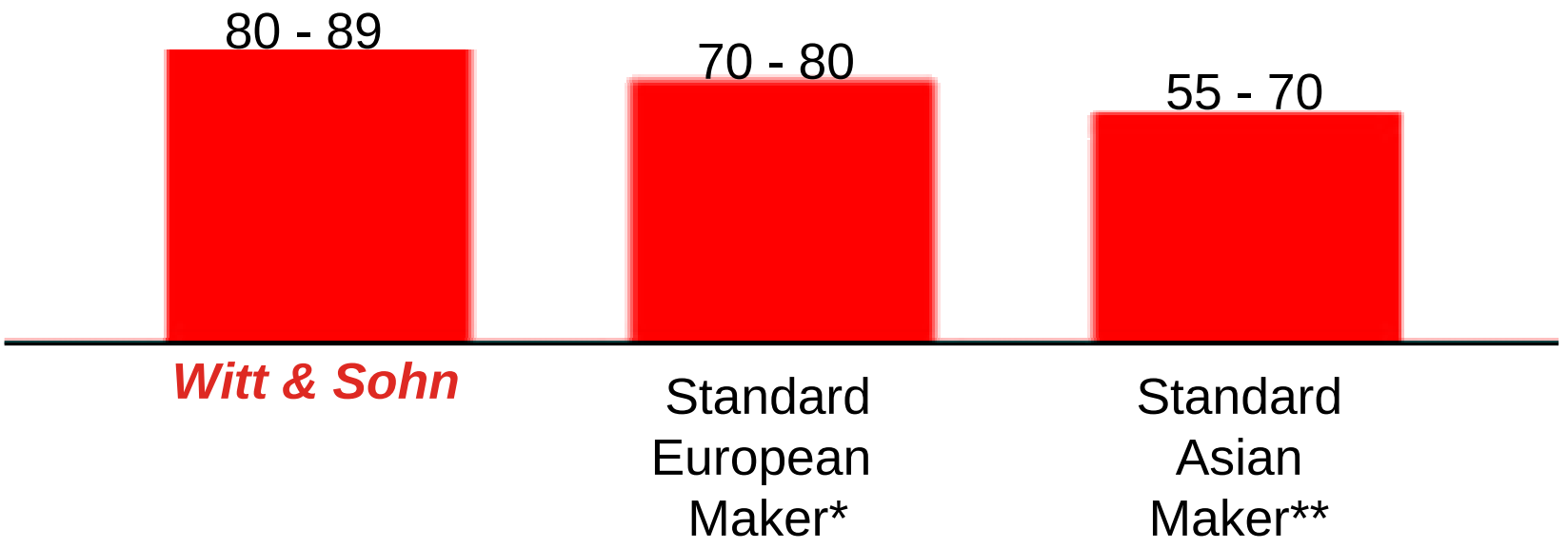
Total peak efficiency of engine room fan in %



* E.g. Denmark, Germany, France, Italy, United Kingdom, Norway

** E.g. Korea, China, Taiwan, Singapore, Vietnam

Additional benefits can be reaped by insisting on energy efficient engine room fans from Witt & Sohn and…

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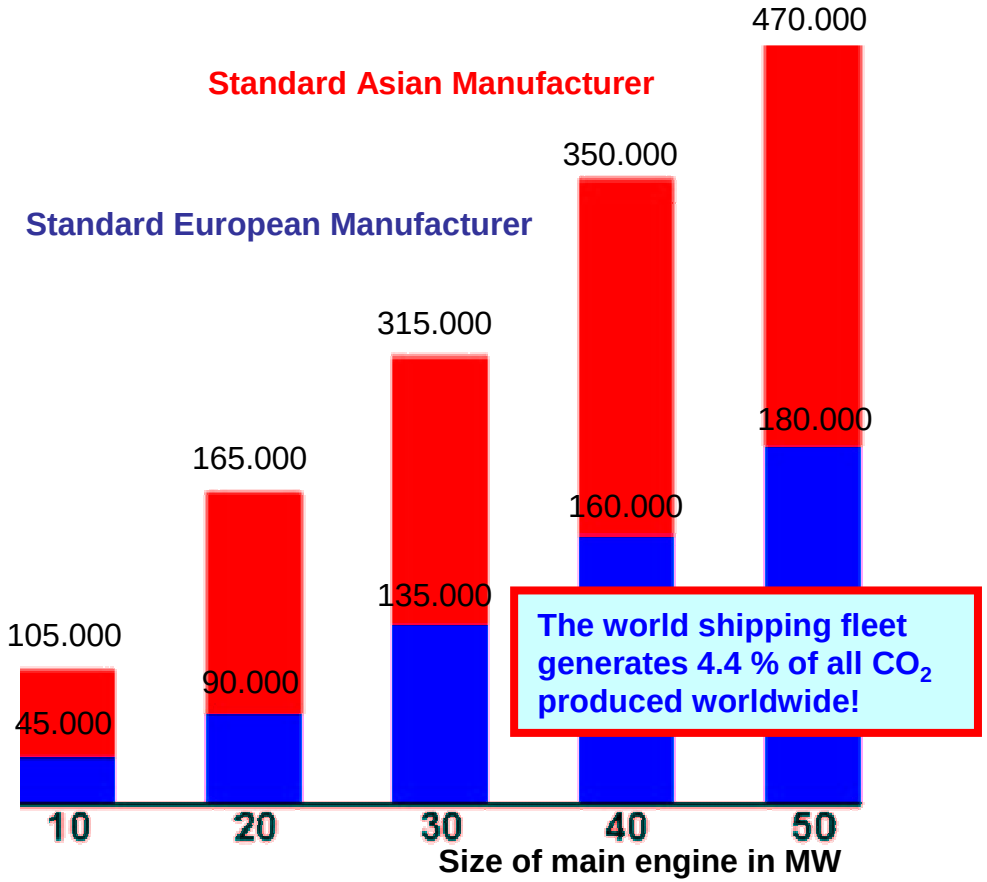
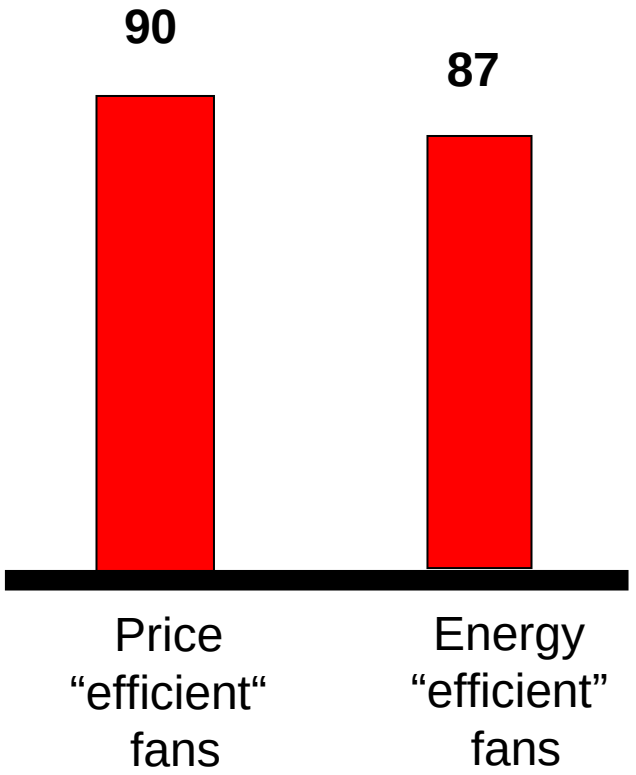
Reduction in CO_2 emission in kg*



Reduction in sound pressure level in dB(A) – 3m

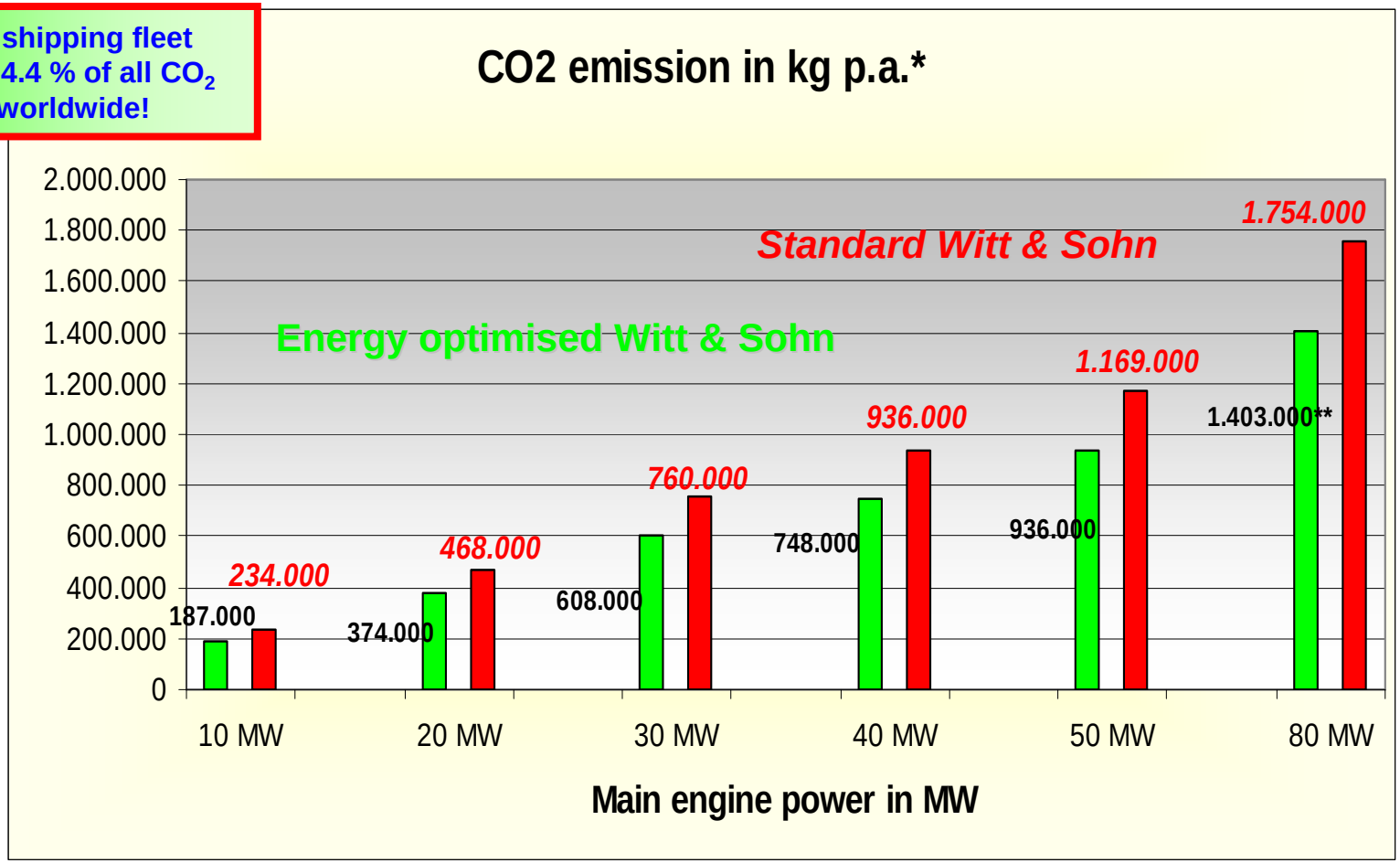


Source: Witt & Sohn AG

* Assuming 730.9 kg CO2 pr. MWh

…by insisting on energy optimised fan design using the Witt & Sohn selection program

The world shipping fleet generates 4.4 % of all CO_2 produced worldwide!



** the saving potential of 350.000 kg can be compared with the CO2-emission of appr 240 cars

Source: Witt & Sohn AG

* Assuming 730.9 kg CO2 pr. MWh

Energy optimised design of Witt & Sohn fans experience that shows

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¶ The ***Witt & Sohn*** fans are designed to achieve optimal efficiency.

¶ Compared to other makers ***Witt & Sohn*** in general achieves 10 – 20 % better efficiency.

¶ The fan price is small compared to the life time operating cost. (Only 1 – 2 %! Pay-back time typically less than 1 year!)

¶ There are additional benefits of ***Witt & Sohn*** engine room fans by making a energy optimised fan selection

Interested?
How to go ahead getting the technology of Witt & Sohn

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NEWBUILDINGS

RETROFIT

Please contact us. We are looking forward to assist you in all projects matters.