



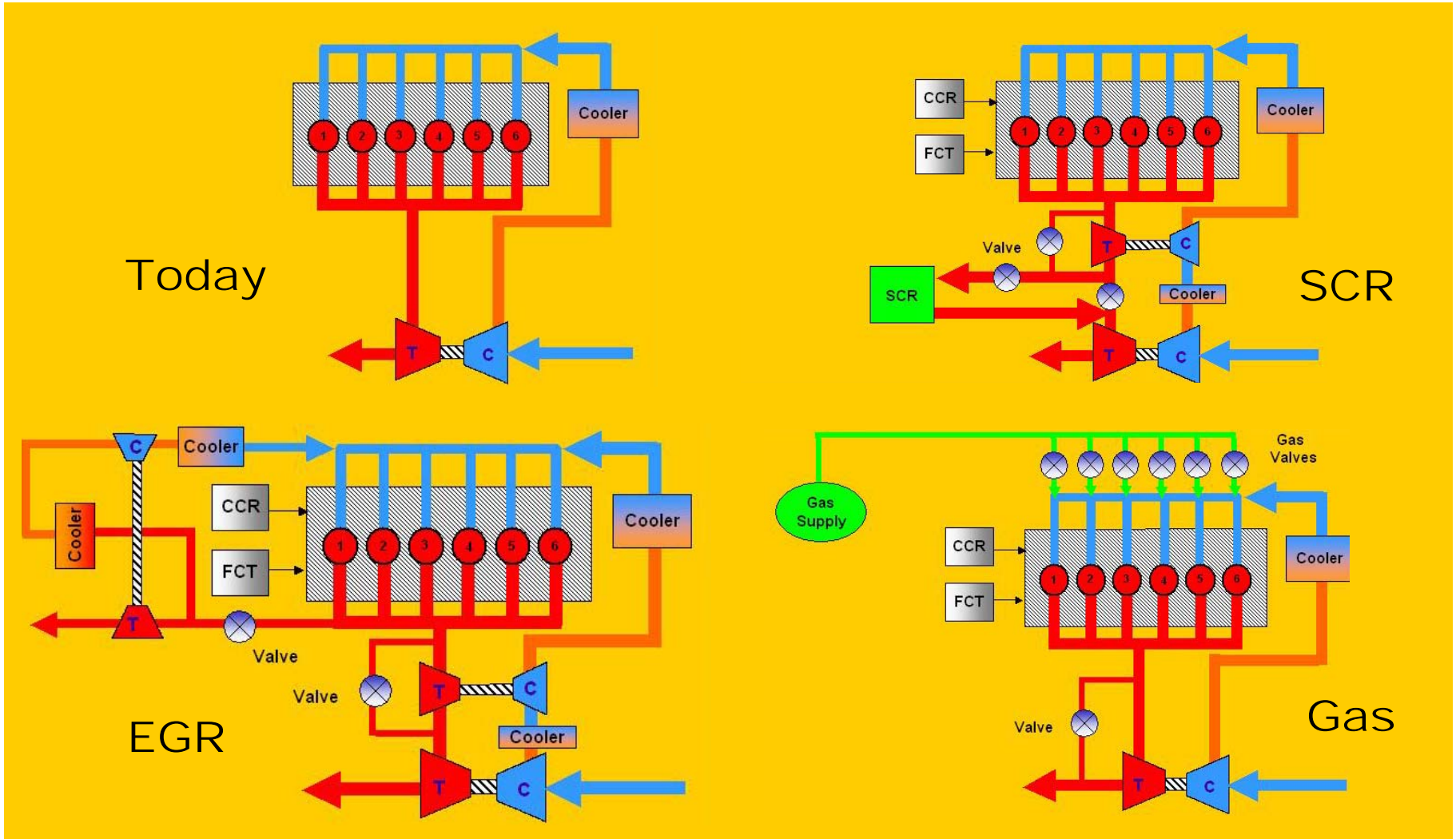
# IMO III is knocking at our door

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9.09.2010

Kiel Engine Center

# Emission Reduction Concepts



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Fig. 2

9.9.10, USK



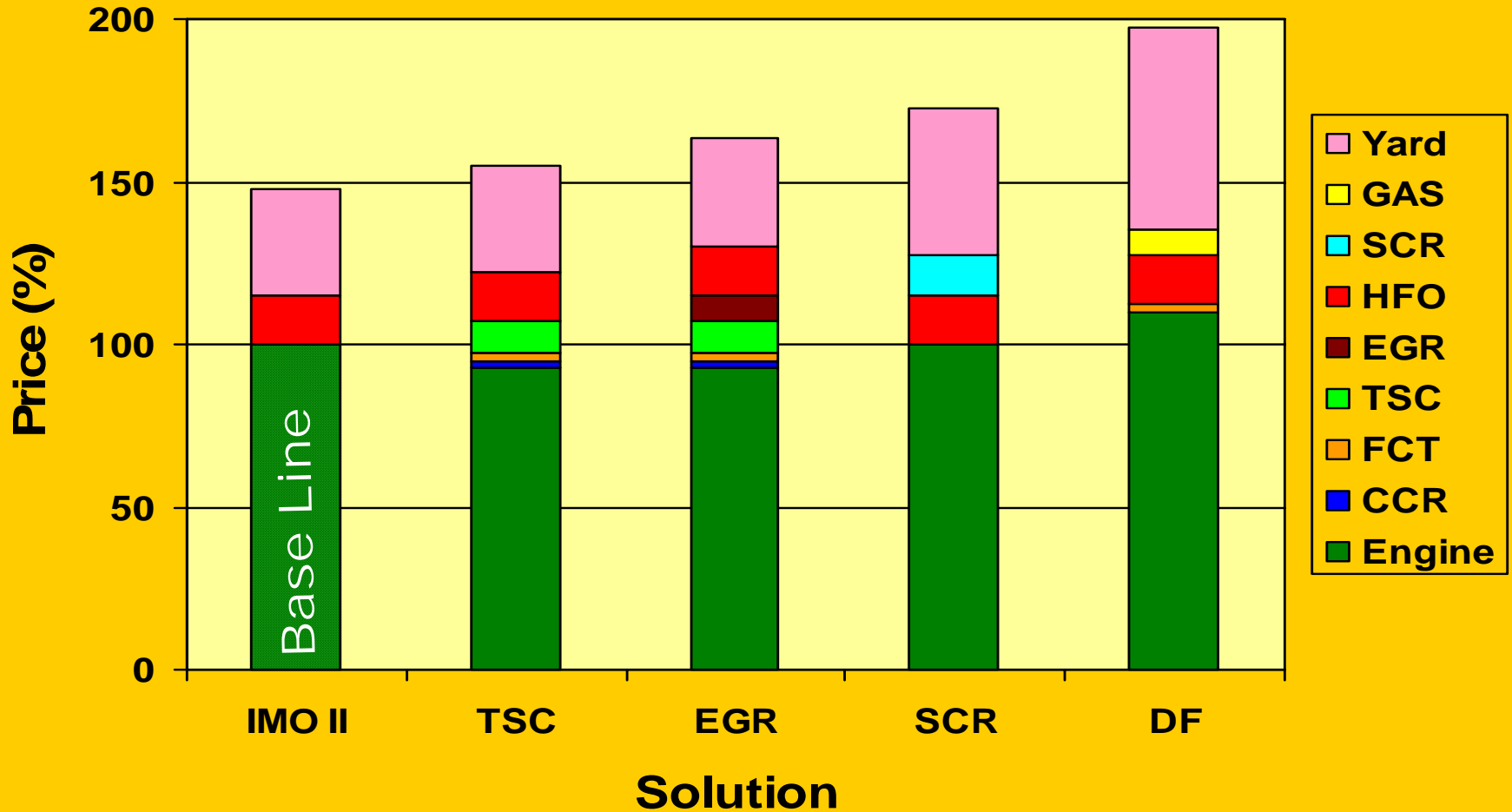
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# Financial Model

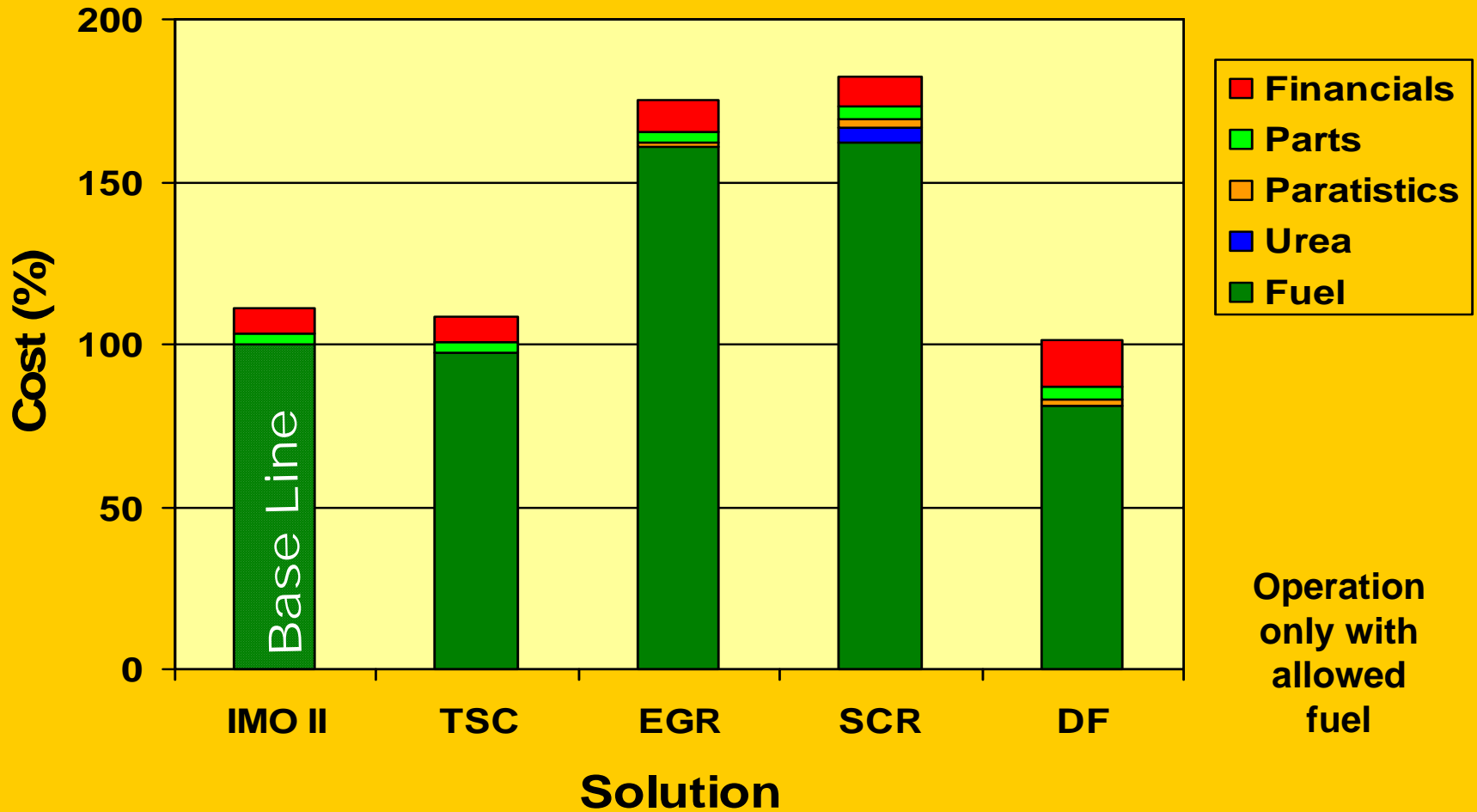
First Cost	Operational Cost
<b>Basic Engine</b>	<b>Fuel, Lube Oil, Media</b>
<b>Additional Equipment (engine)</b>	<b>Parasitic Losses</b>
<b>Add on Technology (engine room)</b>	<b>Parts, Maintenance</b>
<b>Installation by Yard</b>	<b>Financial Burden</b>



# Investment Cost

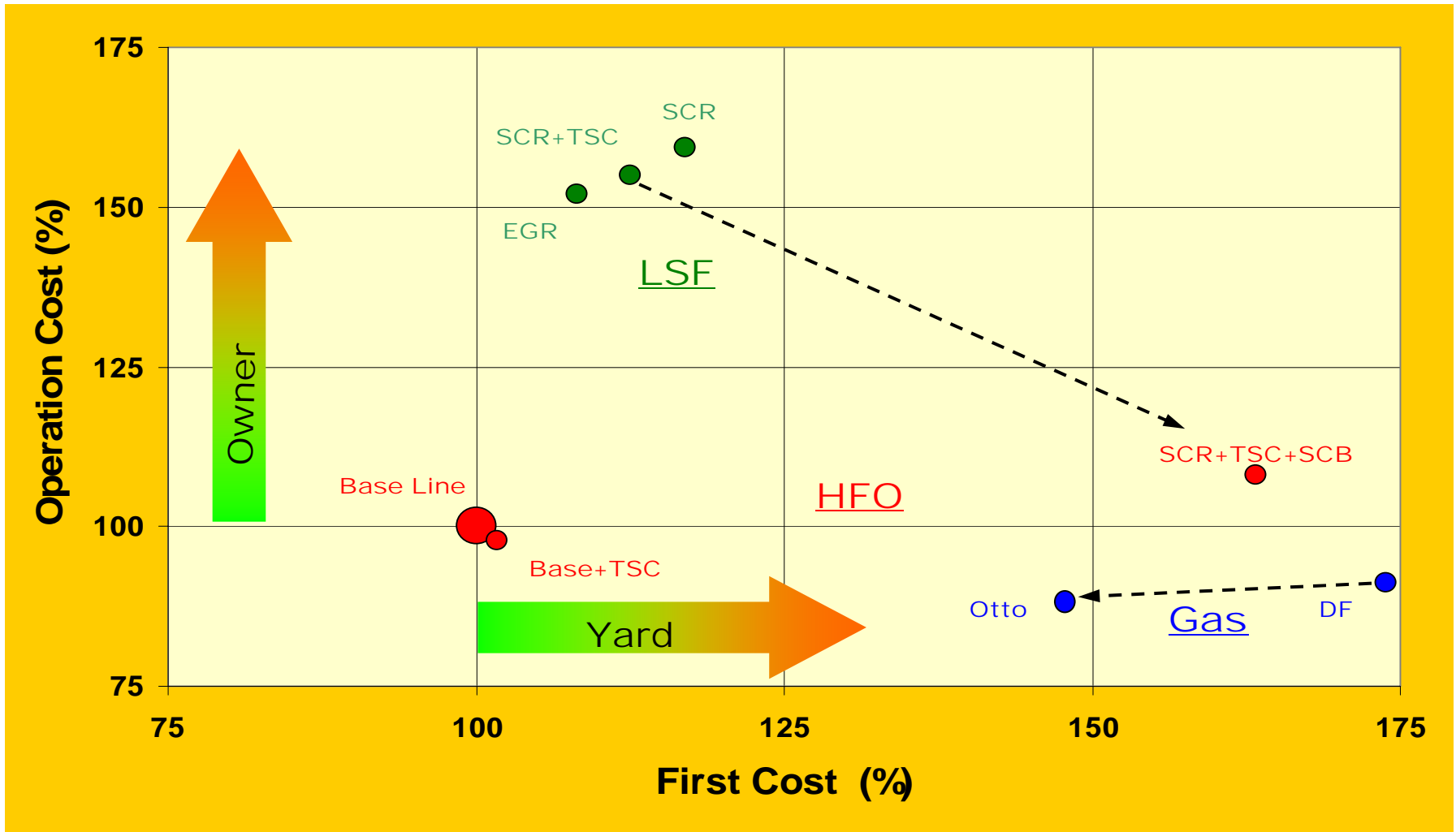


# Operational Cost





# IMO III operation, inside ECA



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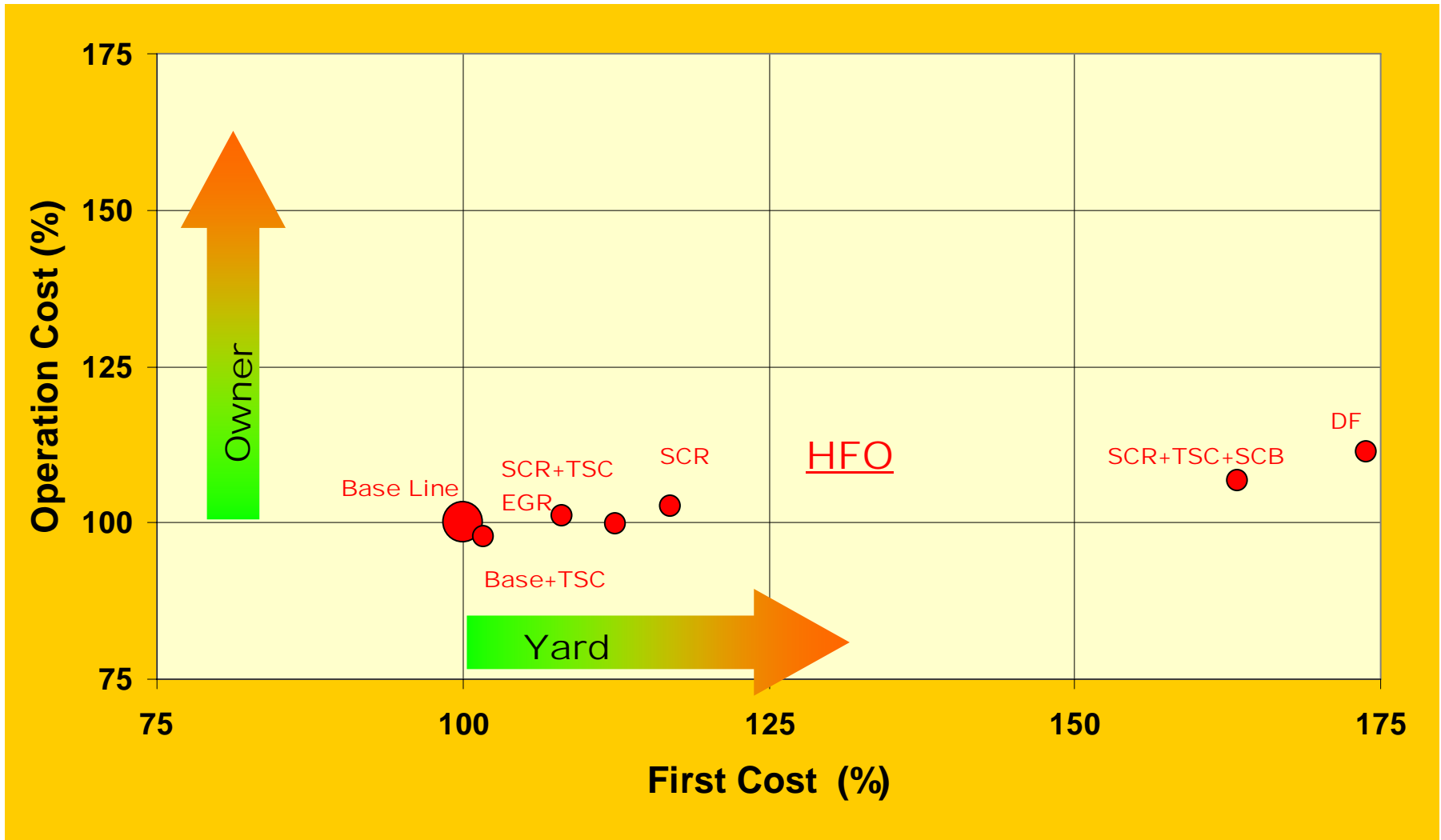
Fig. 6

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# IMO II Operation, outside ECA



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Fig. 7

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# Summary

- **LSF is an expensive solution**
- **De SOx systems have to be developed**
- **DF is interesting, but needs infrastructure**
- **Otto Gas may be the long term solution**
- **Gas is a suitable way for CO<sub>2</sub> reduction**







Thank you for  
your Attention



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Fig. 9

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