



**CIMAC**

THE INTERNATIONAL COUNCIL ON COMBUSTION ENGINES



# Power Gen – All about Efficiency?

**Patrick Frigge**

Amsterdam, 09 June 2015



GE Power & Water



# Power Gen – All about Efficiency?

Patrick Frigge, General Manager Recip Engines >5MW

Power Gen Europe | Amsterdam, Netherlands | 9-11 June, 2015

Imagination at work

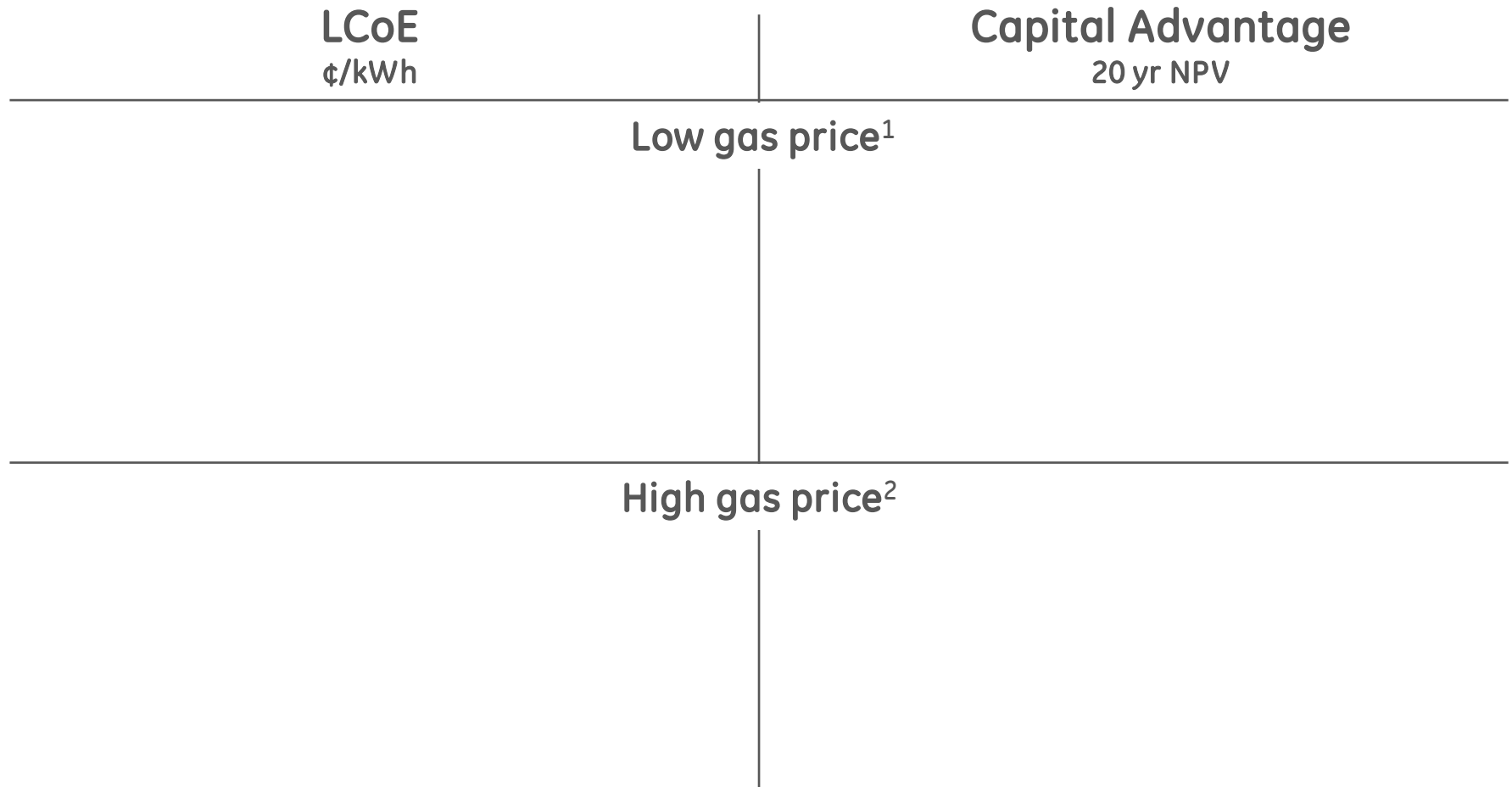
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# Converting natural gas to electricity...

## Levelized Cost of Electricity (LCoE) and Net Present Value (NPV)



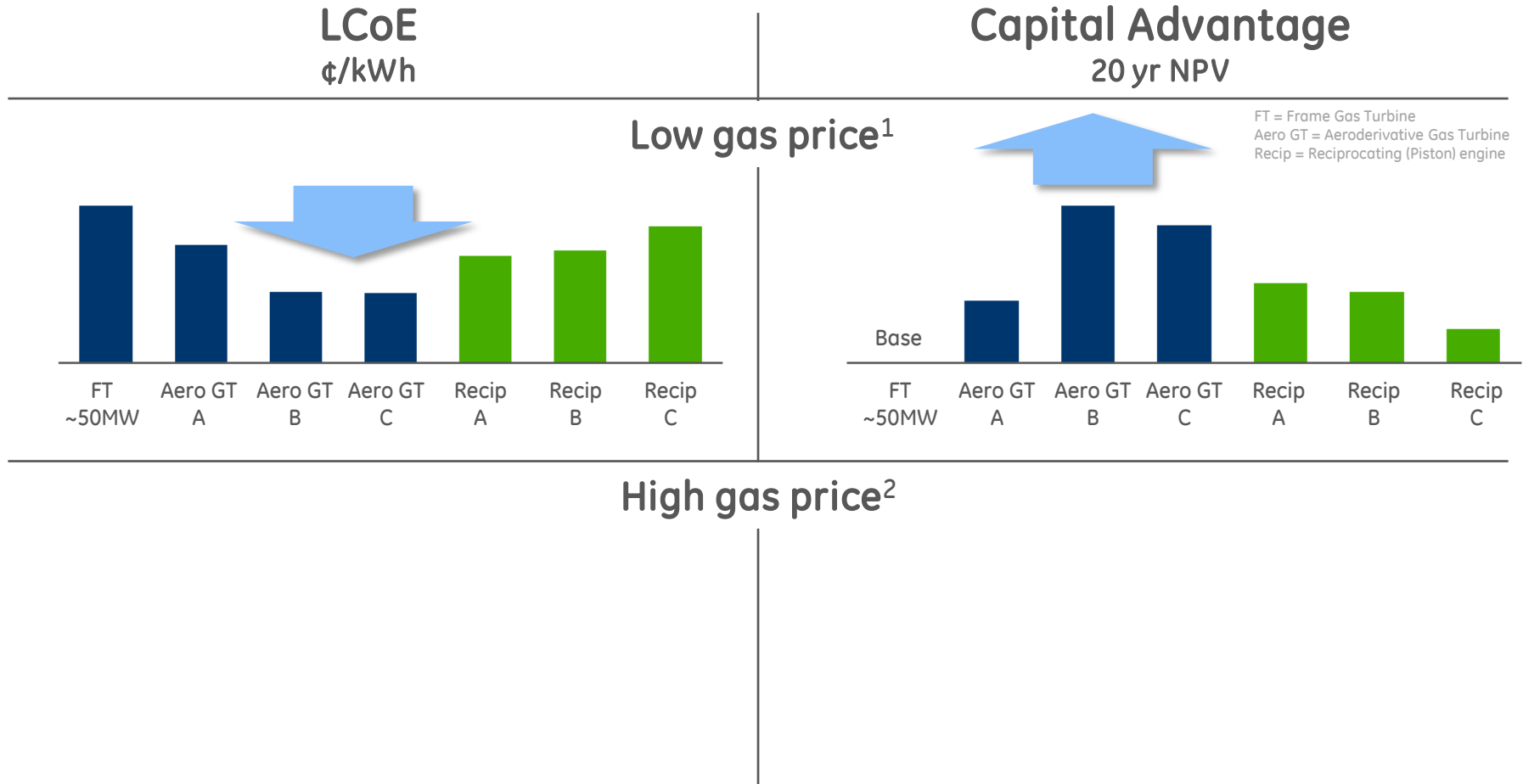
<sup>1</sup>: 2,000 operating hours, €12/MWh gas, Avg. 5 hours/start, 20 yrs project lifetime, 9.2% discount rate

<sup>2</sup>: 4,000 operating hours, €35/MWh gas, see above



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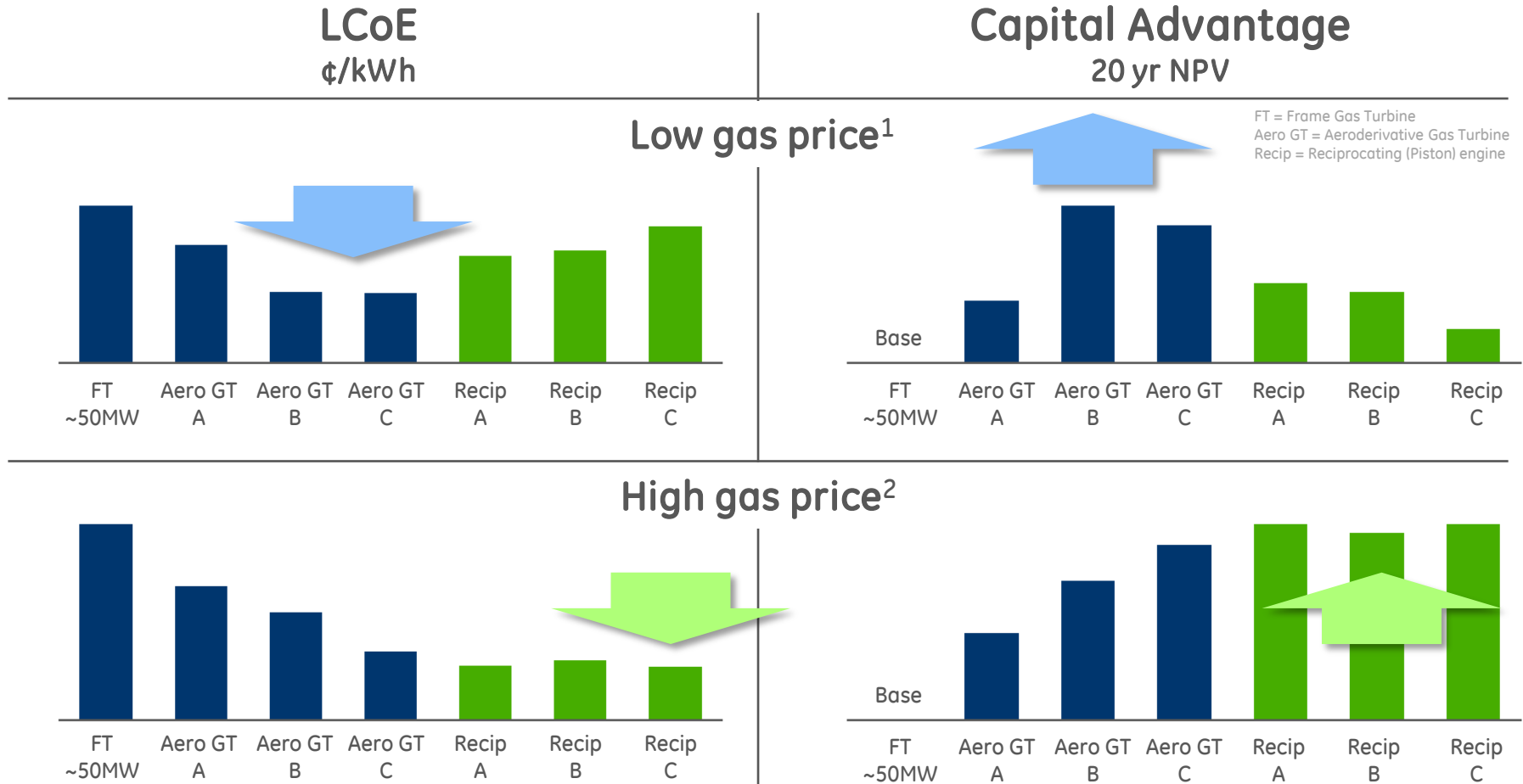


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# Converting natural gas to electricity...

## Levelized Cost of Electricity (LCoE) and Net Present Value (NPV)



High cost of gas? Efficiency is key! → Reciprocating engines in favor



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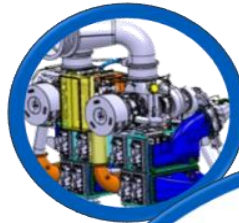
# State of the art recip engine features, promoting renewables balancing

## Low operational expenditure

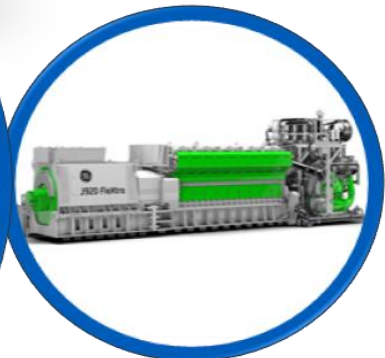
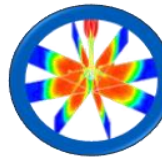
- ✓ High efficiency
- ✓ Maximum uptime & availability
- ✓ High part-load efficiency
- ✓ High hot day / high altitude performance
- ✓ Fast startup & fast load response

## Low capital expenditure

- ✓ Small installation footprint
- ✓ Modular, standardized solution
- ✓ Fast installation time
- ✓ Low transport and installation/ commissioning cost



*"Industrial Internet"  
Remote  
Monitoring &  
Diagnostics*



*Downsizing  
2-stage  
turbocharging*

*Modular design*



*Power unit  
concept*







Is it all about efficiency?  
Yes it is! (and about flexibility, too)

