

High-Temperature Waste Heat Utilization: *Towards Flame-Temperature Topping Cycles*

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Fellow

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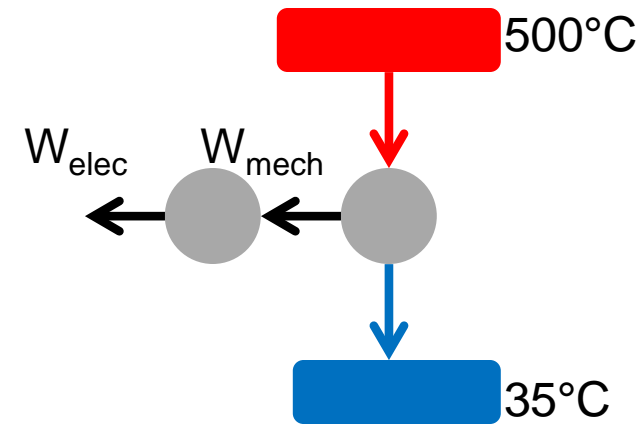
Coal-Air: 2150°C

NG-Air: 1950°C

Coal/NG-Oxygen: 3000°C

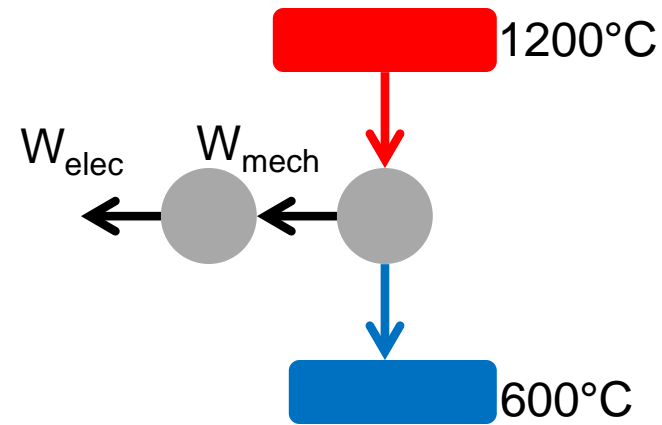
SOA Heat Engines

Steam-Rankine



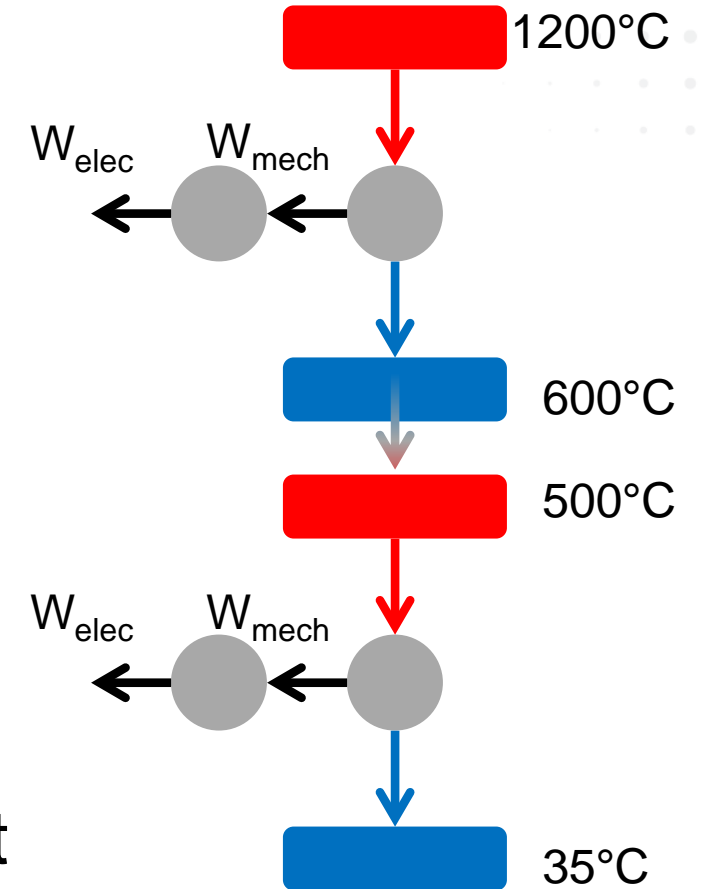
Around 40% Efficient in best cases

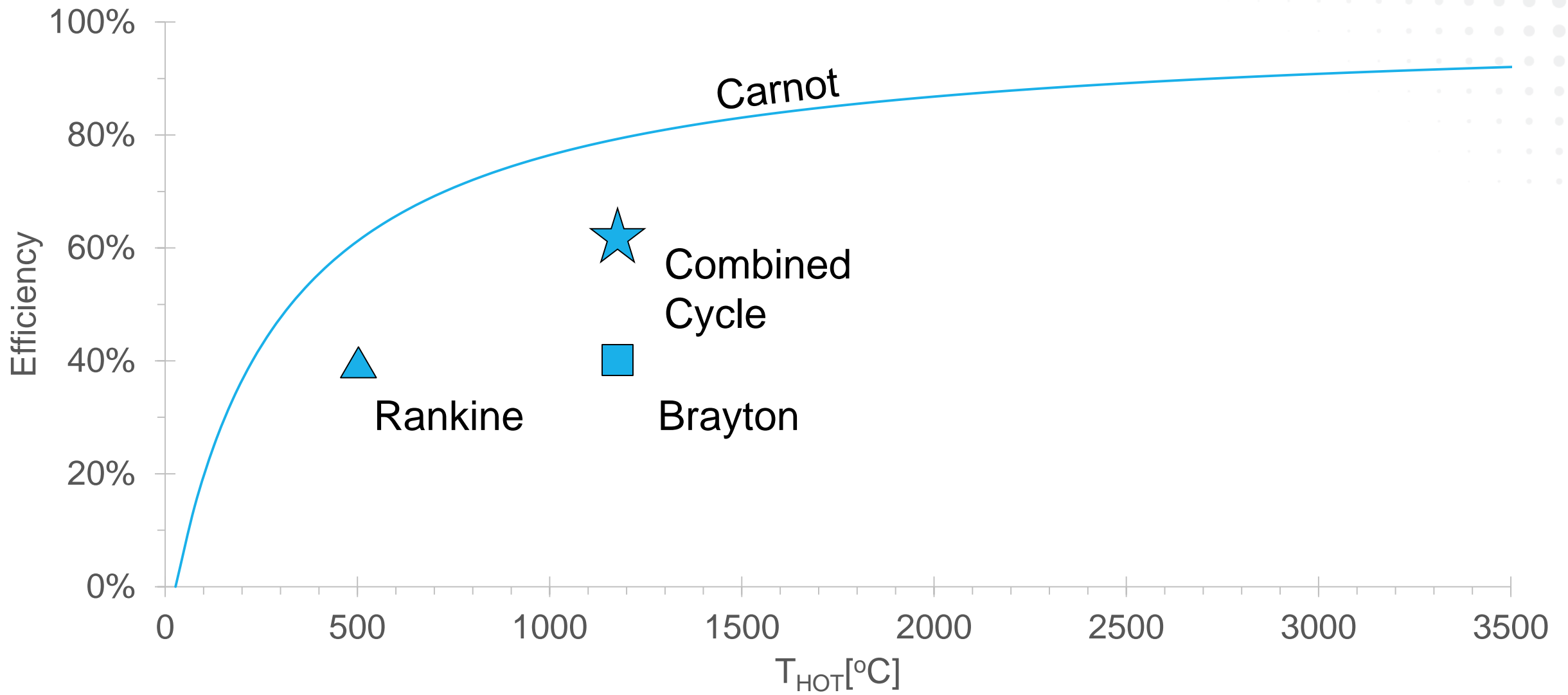
Air-Brayton

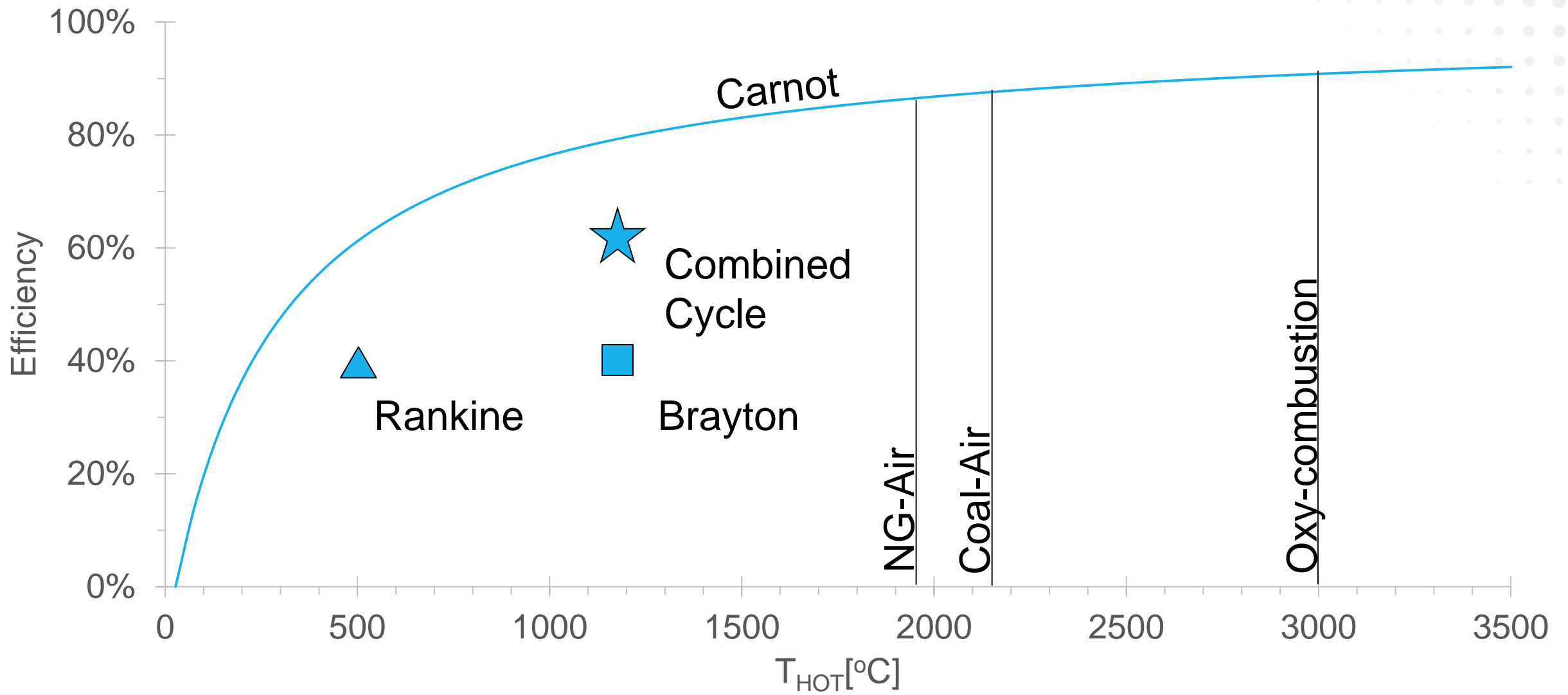


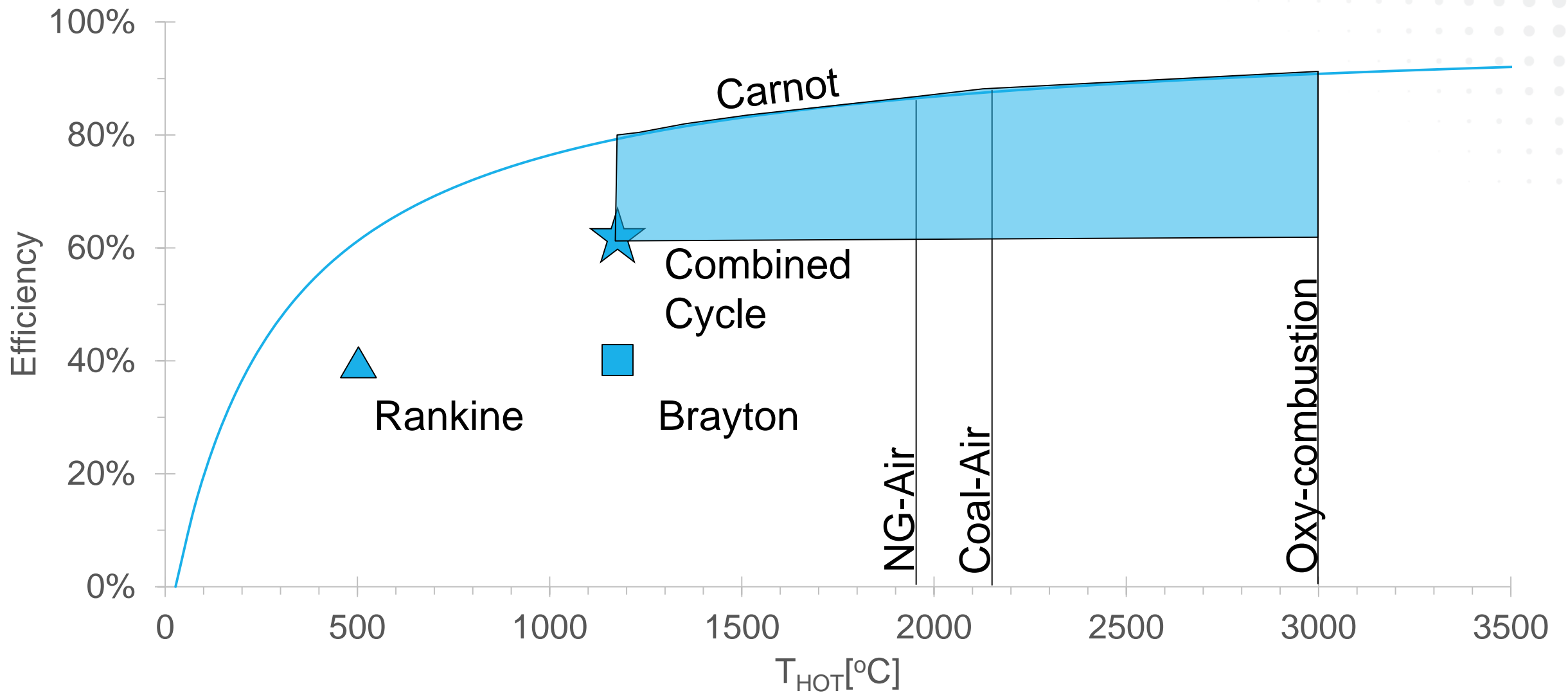
50-60% Efficient

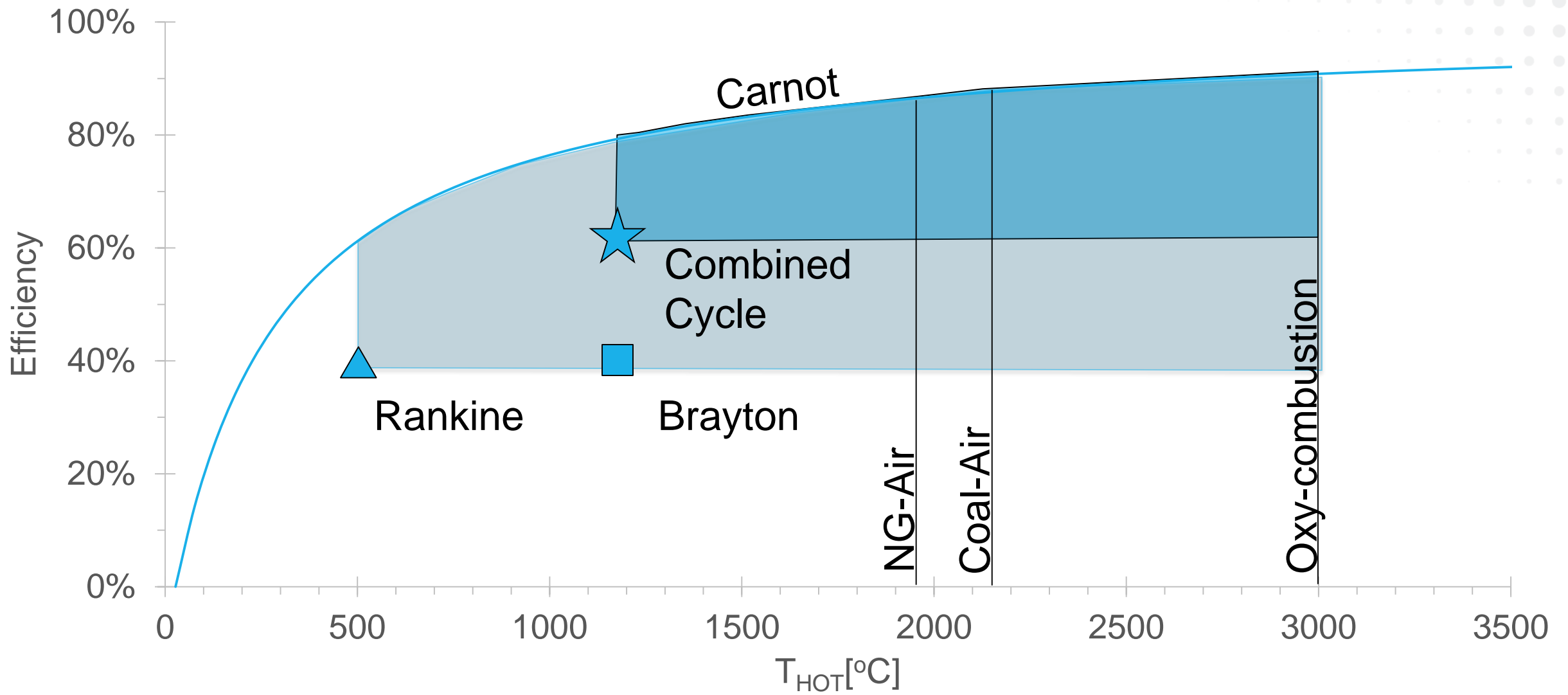
Combined Cycle



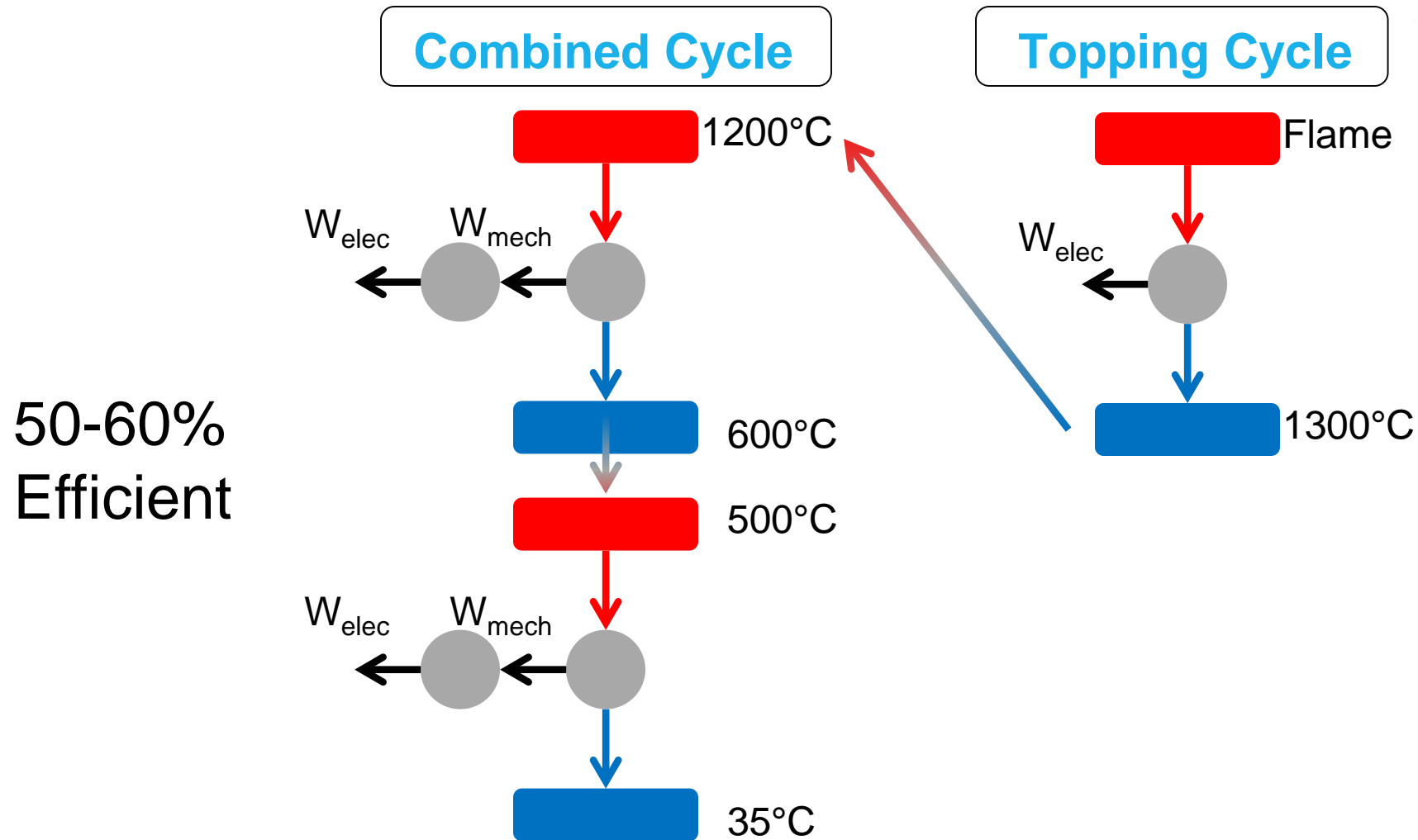


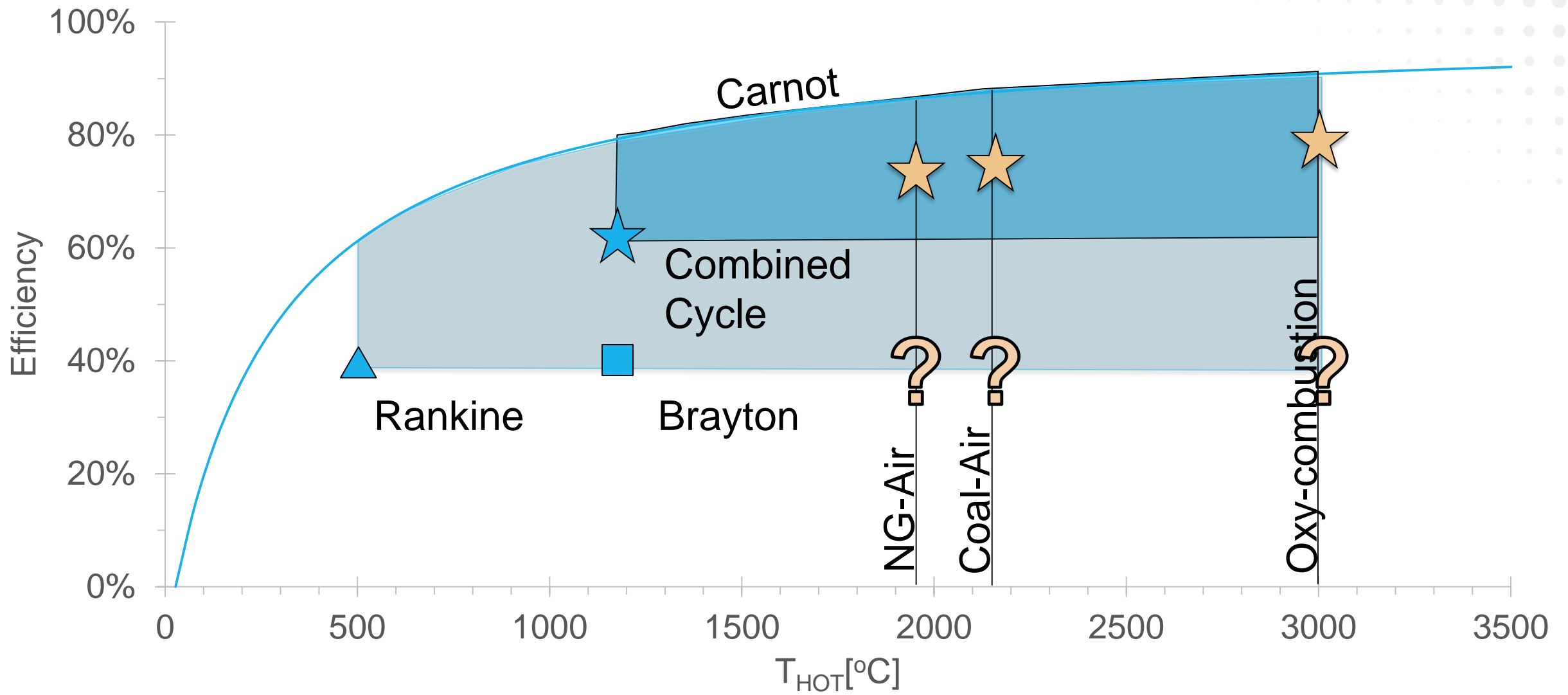






Towards a new Flame Temperature Topping Cycle

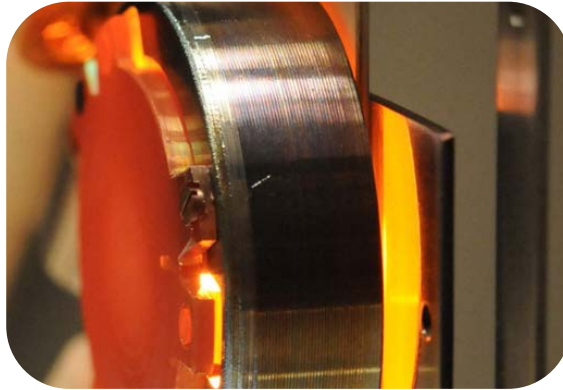




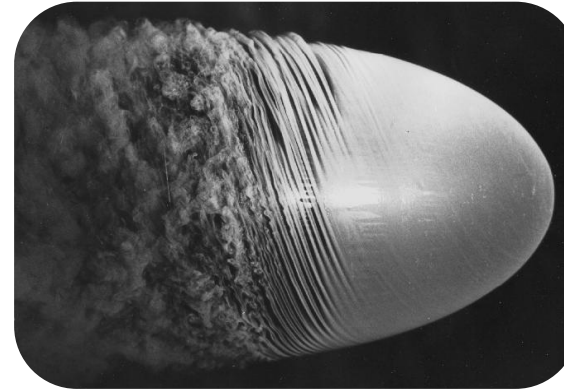
What Can Get Us There?



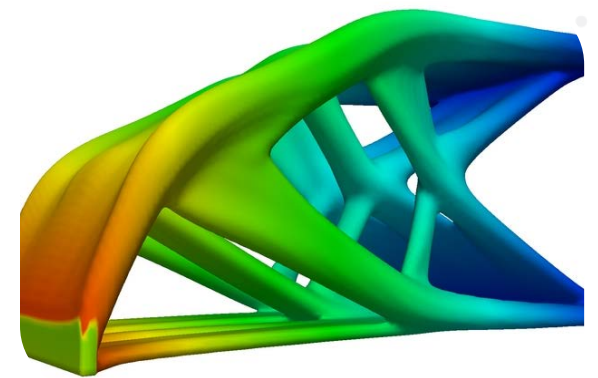
High T Materials



Novel Heat Engines



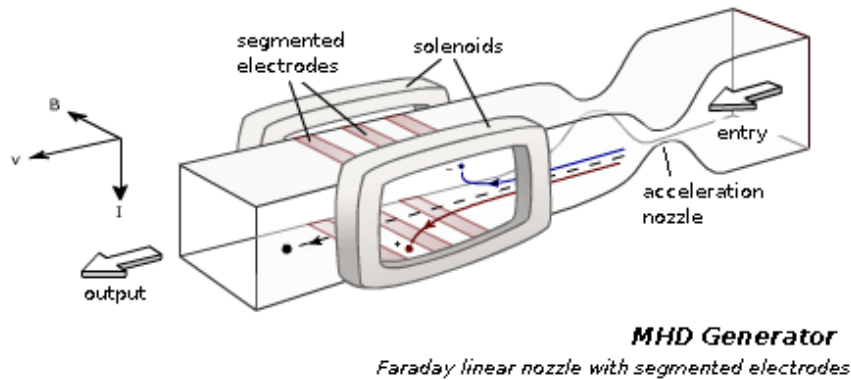
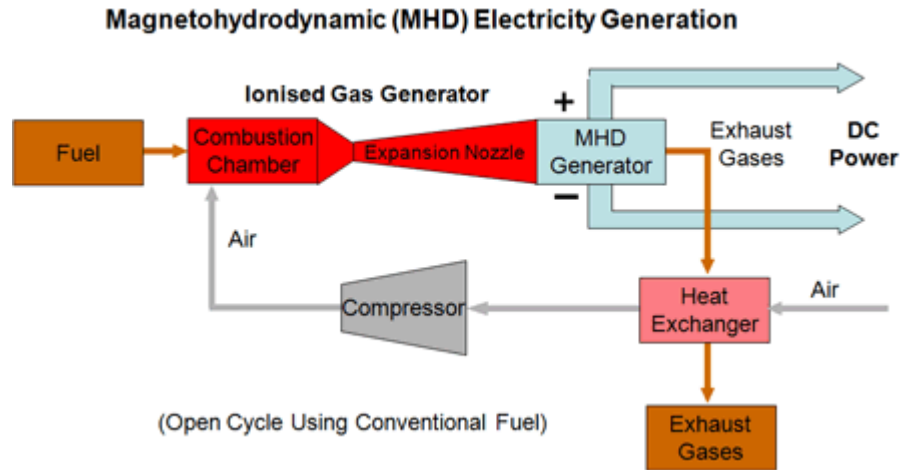
Thermal
Management



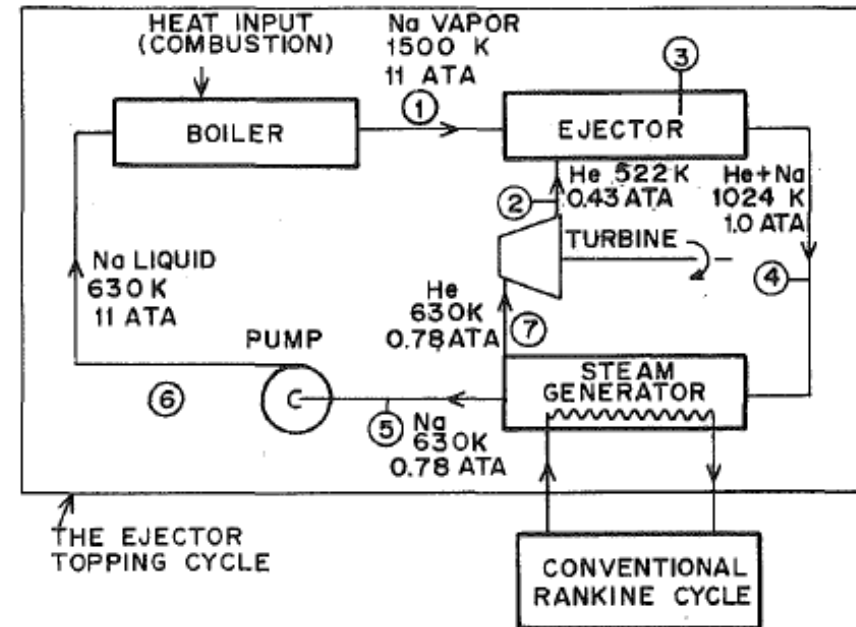
Topology &
Geometry
Optimization

Novel Heat Engines

Magneto-Hydrodynamic Generators

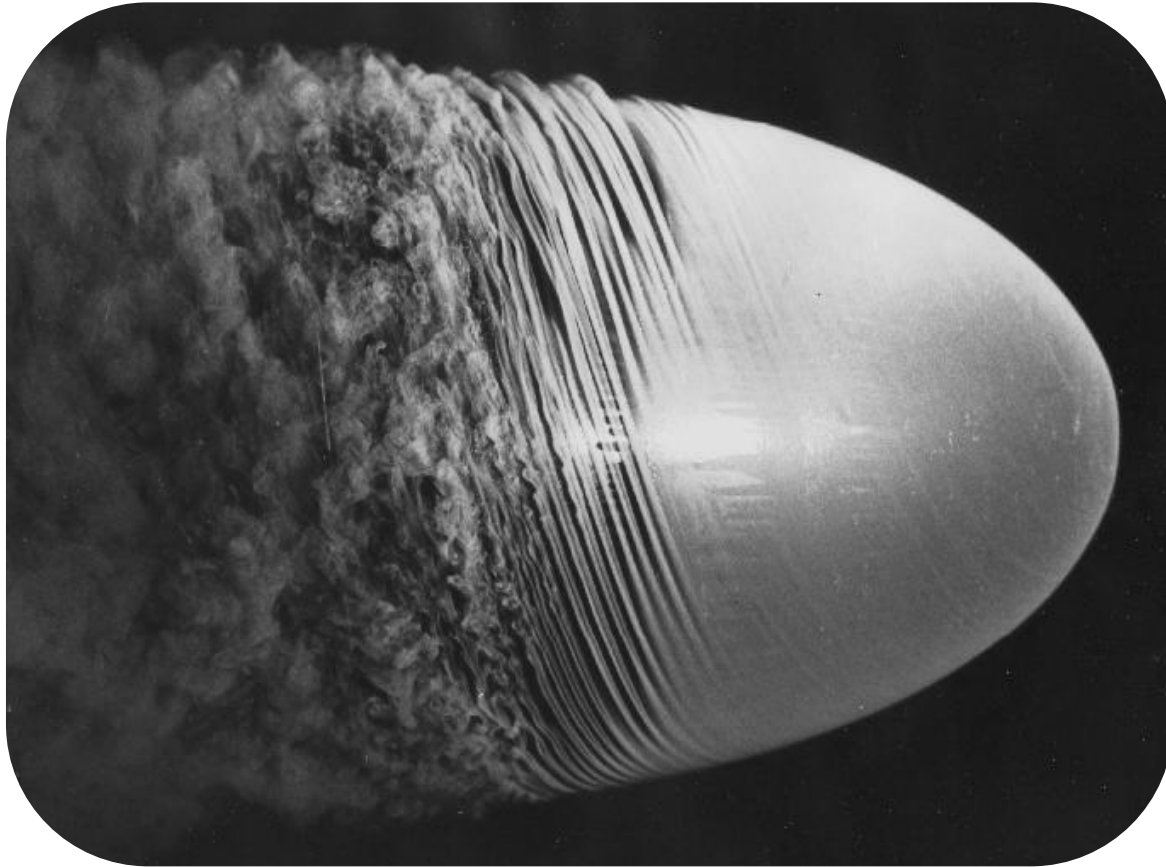


High-Temperature Ejectors

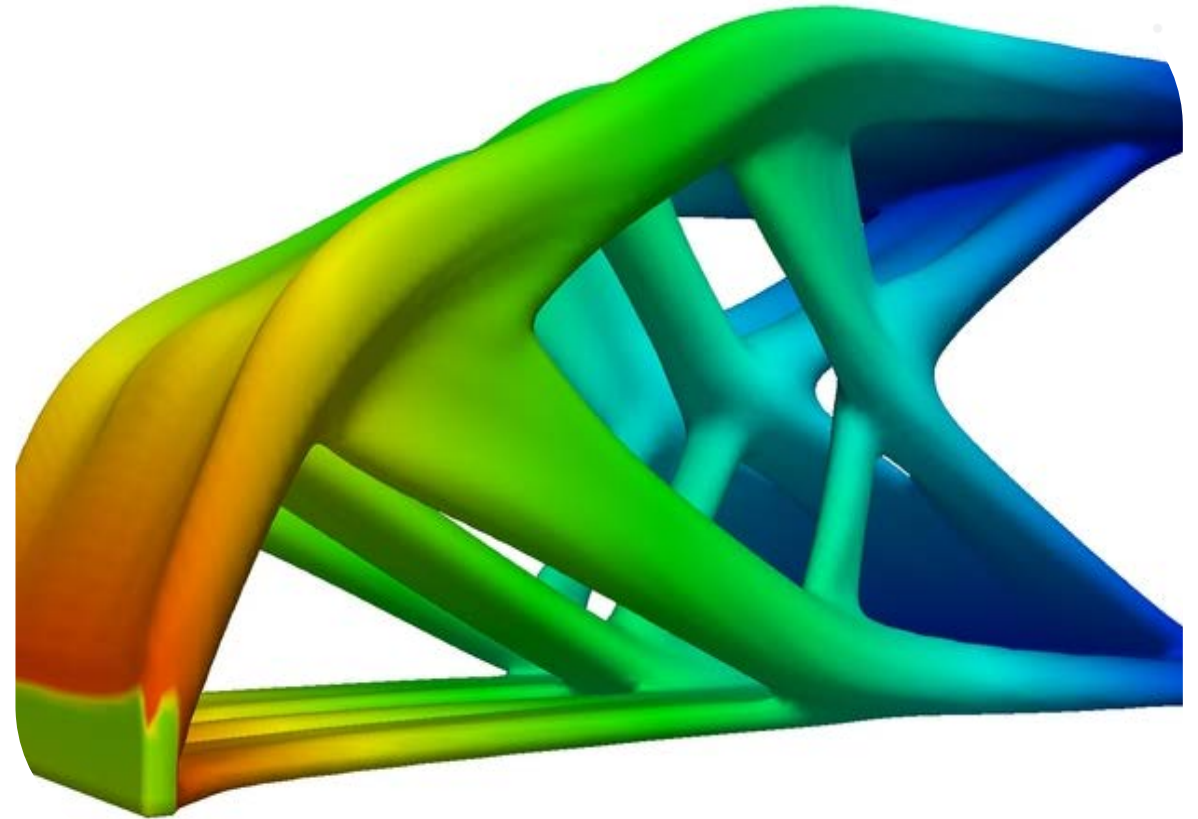


Novel Engineering

Enhanced Cooling



Topology and Geometry Optimization





Thank You.

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