

Forum Barcelona 2004

Waste Energy Recycling Plant

District Energy System

by

Murray Millander

Distributed Energy Solutions

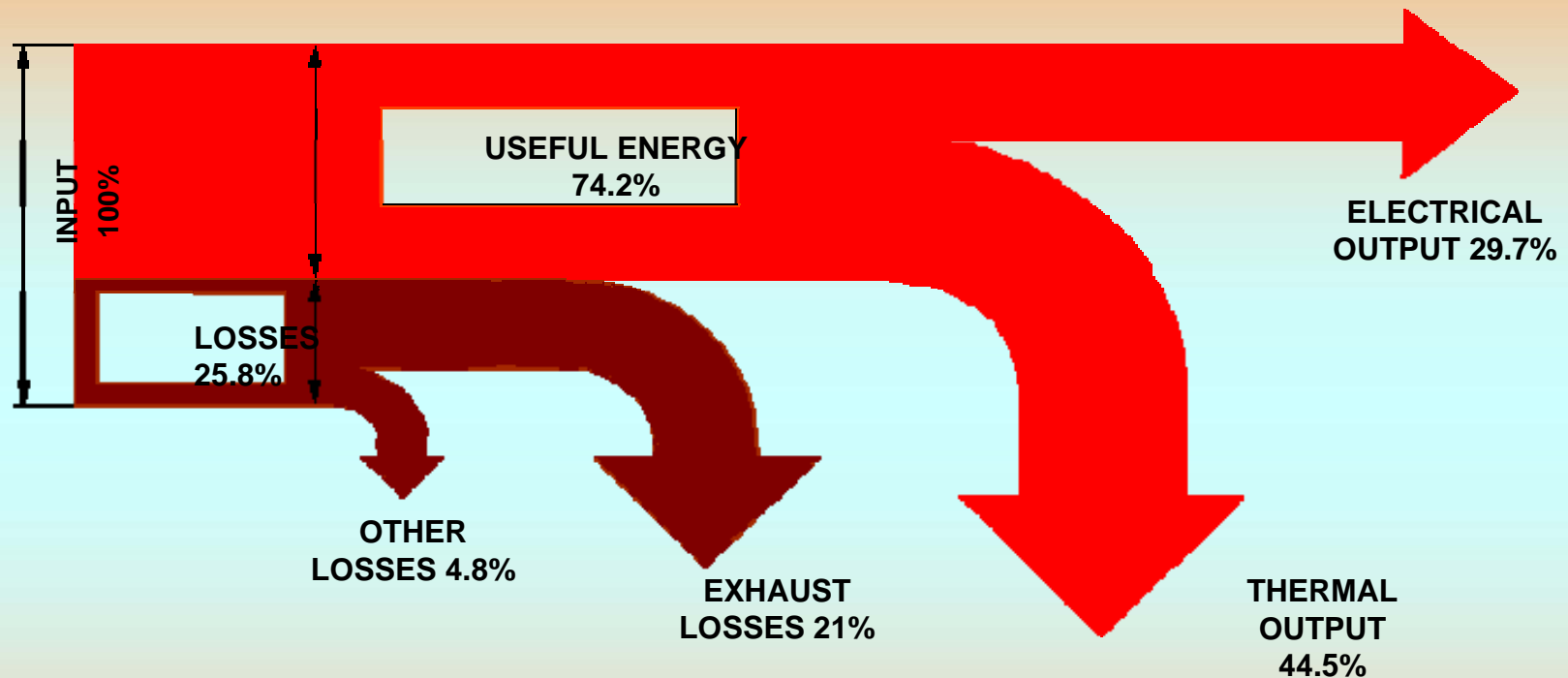
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CO-GEN CONCEPT



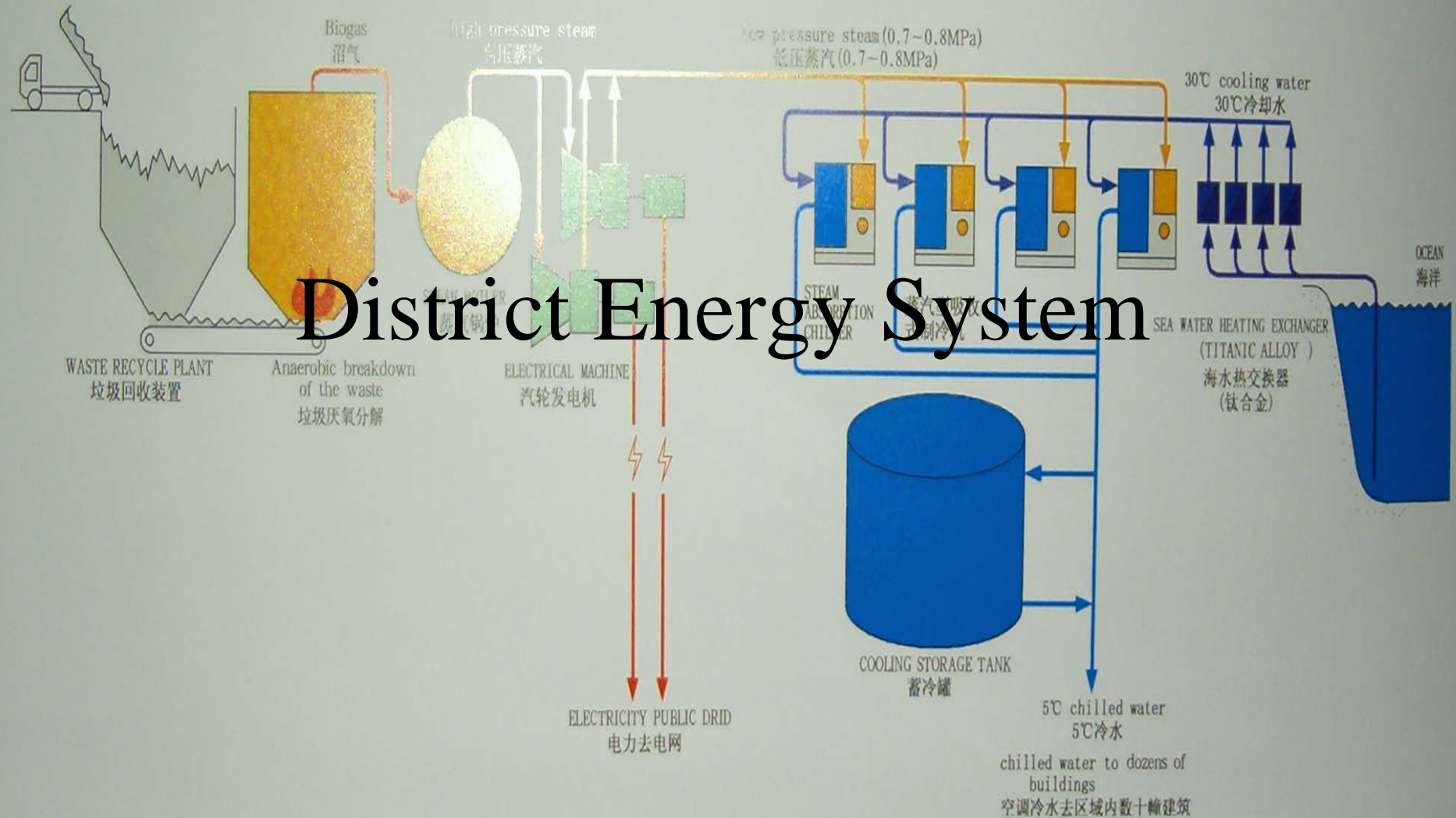
Offset building thermal loads by Recycling the waste heat energy available at site

Reduces Costs and increases Reliability

Increases Efficiency and Reduces Fossil Fuel Combustion

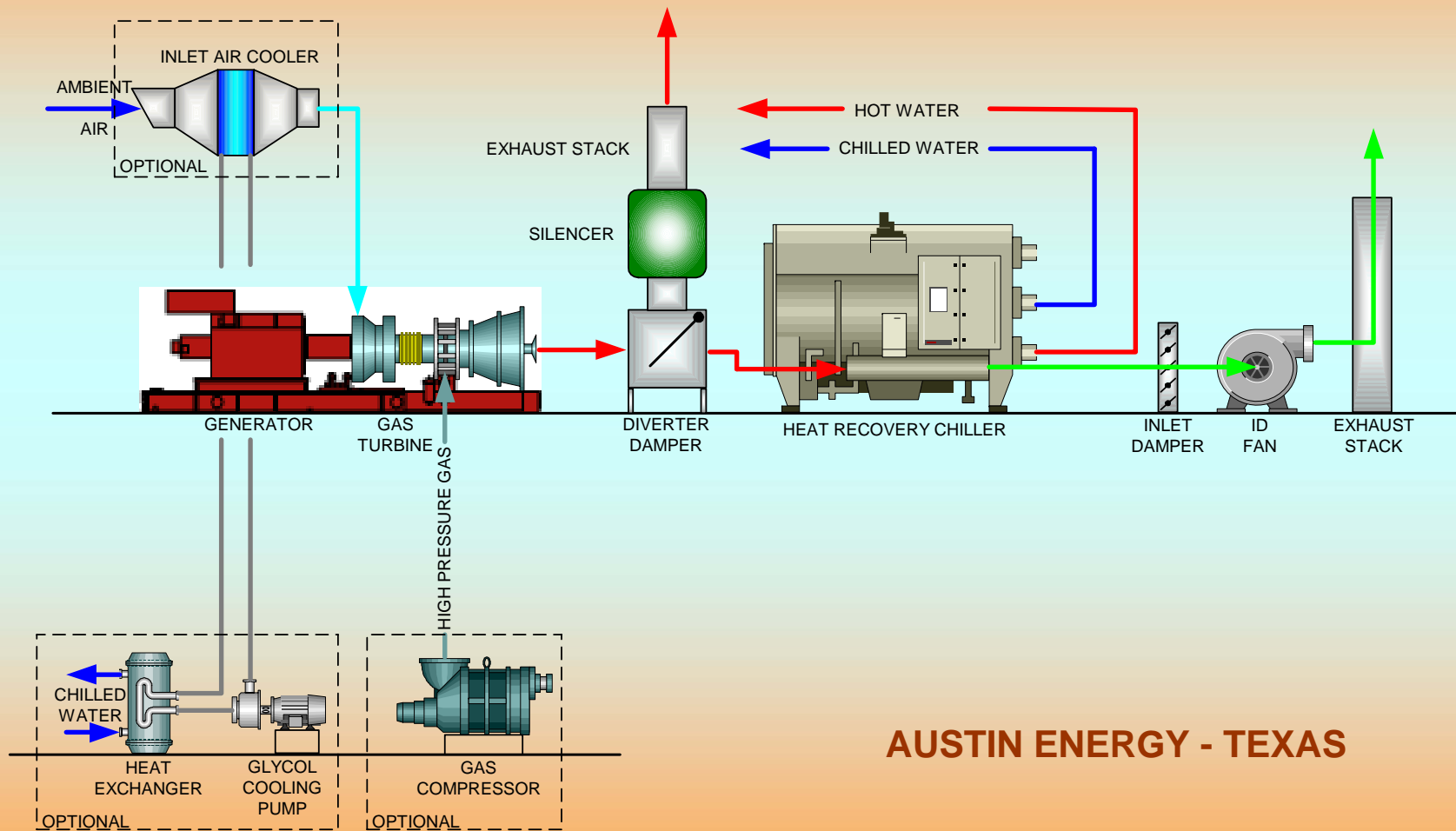


District Energy System Diagram
论坛区能源系统示意图



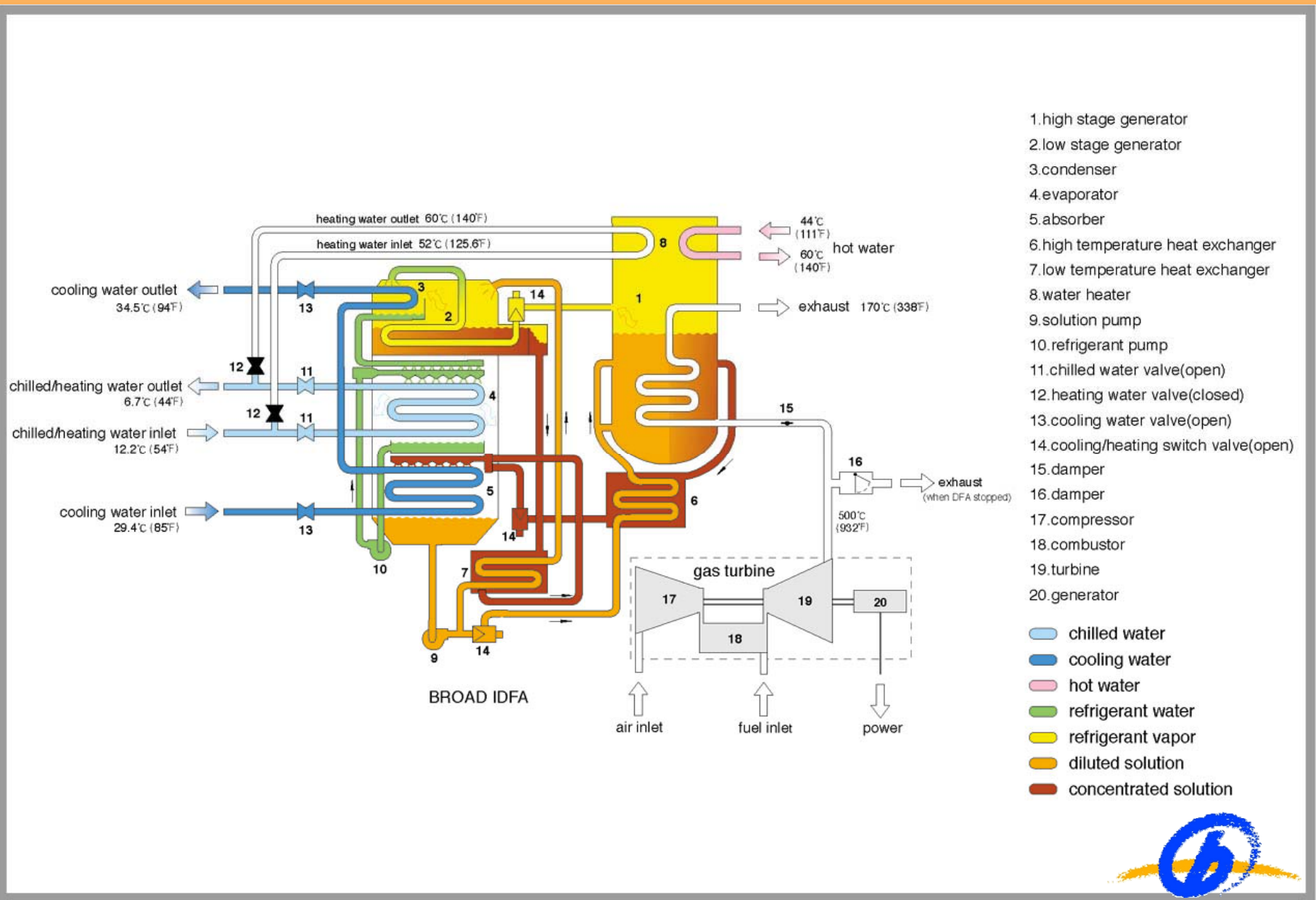
District Energy System

CCHP Exhaust Reference Design

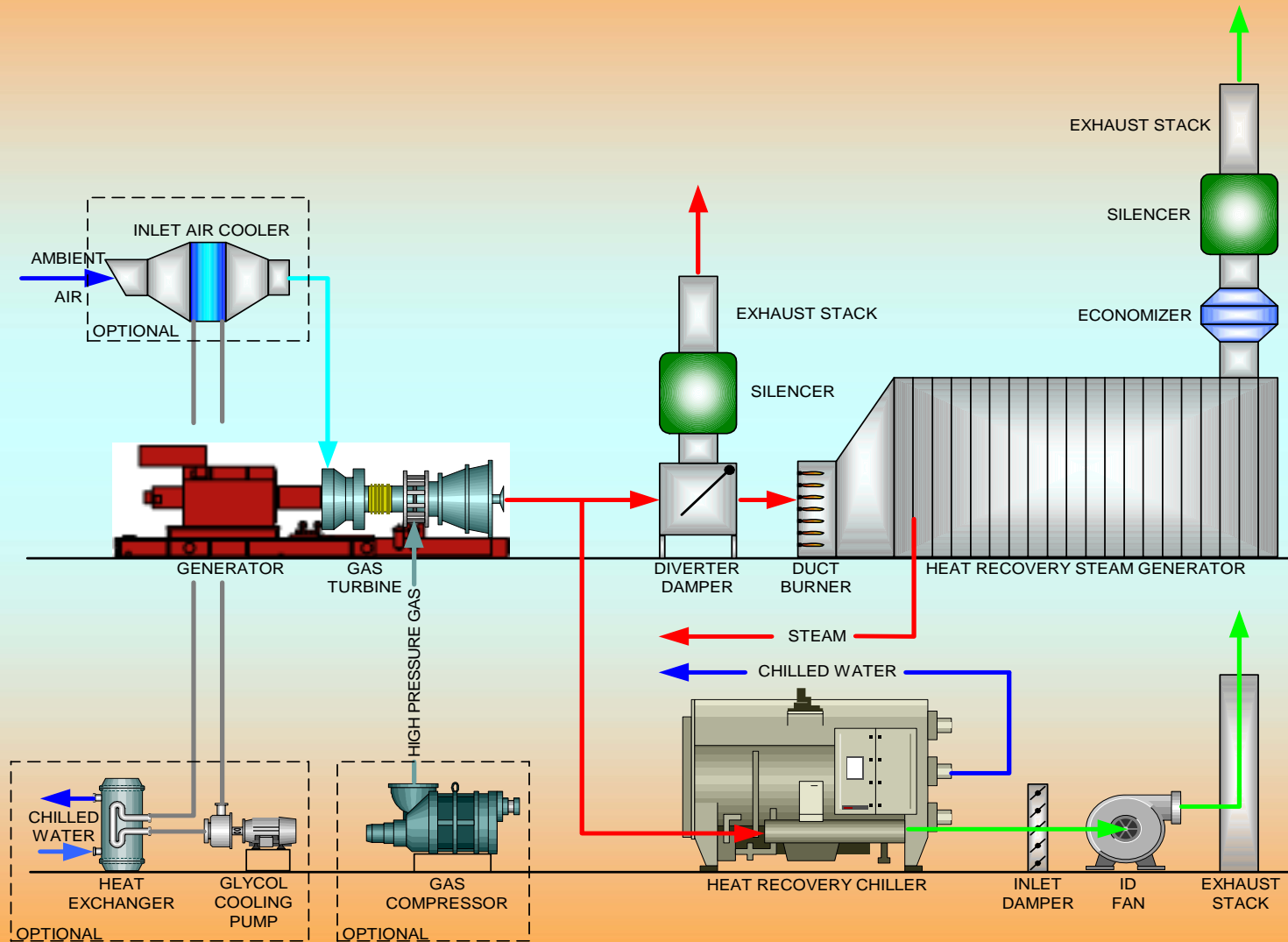


AUSTIN ENERGY - TEXAS

Two Stage Hi-Temp Exhaust Fired

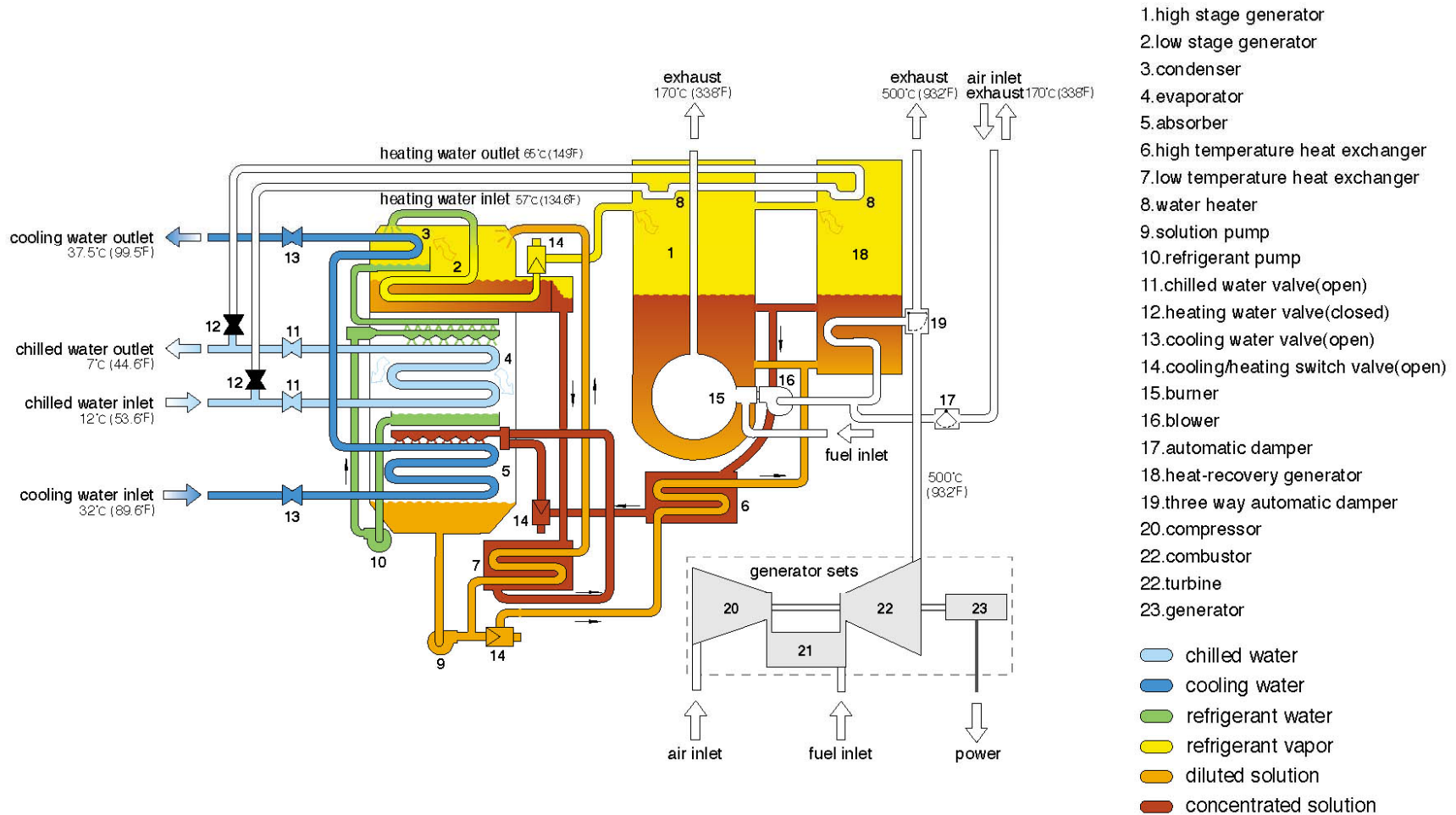


CCHP Traditional Reference Design

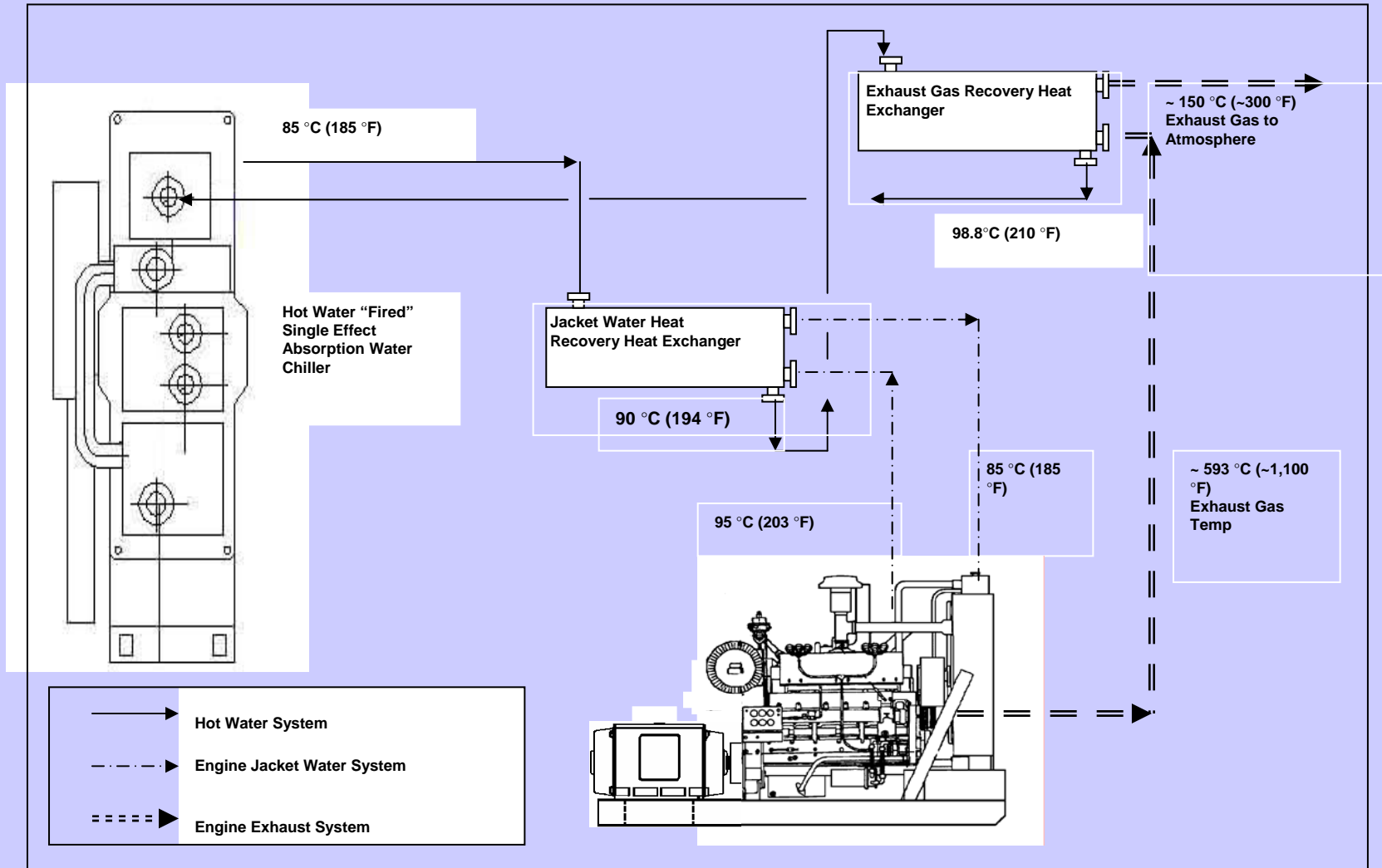


FT BRAGG – N. Carolina

Natural Gas/Exhaust Co-Fired w/HEX



Reciprocating Engine with Jacket Water and Exhaust Recovery and Single-Effect Absorption Chiller



Broad Two Stage Steam Absorption Chiller



CHP Test Case Profiles

University of Maryland & Pico Rivera, CA

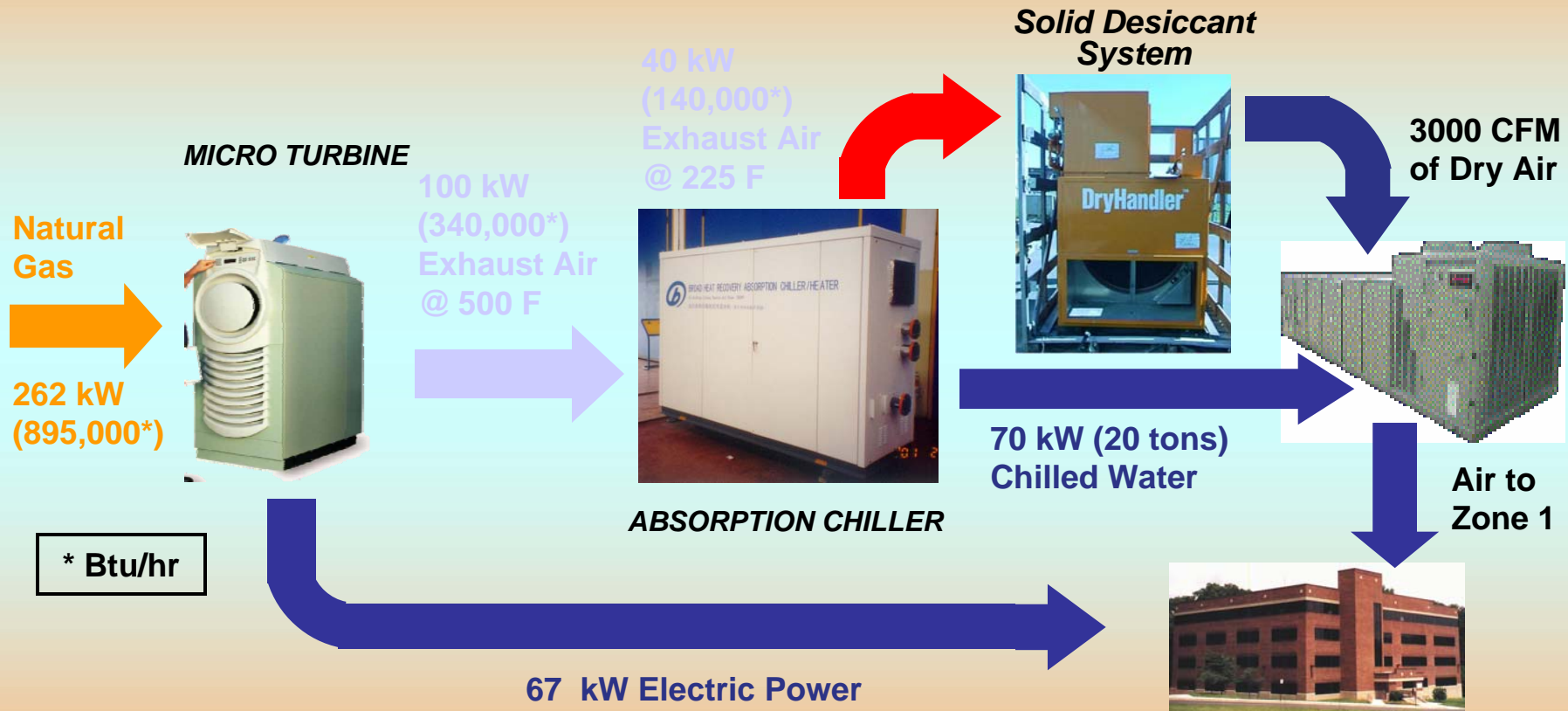
DOE/ORNL

Microturbine/Absorber/Desiccant



UMD BCHP System 2

Single Stage Lo-Temp Exhaust Fired



- Turbine efficiency 25.6 %, with chiller 63.5 %, and with desiccant 79.2%
- Single effect absorption chiller with COP of 0.7



CHP Choices & Issues

Generator	Range	Cooling TAT	Av. Ton/kW
Gas Turbine	> 1 MW	Absorber Steam Turbine	.3 to .8
Microturbine	< .4 MW	Absorber Desiccant	.4
IC Engine	.1 to 3 MW	Absorber Desiccant	.3
Fuel Cell	> .25 MW	Absorber	.15



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Q & A

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Thank You

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Solutions for the Conscious Use of Energy

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