

IEA International Workshop

Session 2

The development of energy sharing in industrial areas with Pinch Technology

ピンチテクノロジーを用いたコンビナートのエネルギー共有の展開

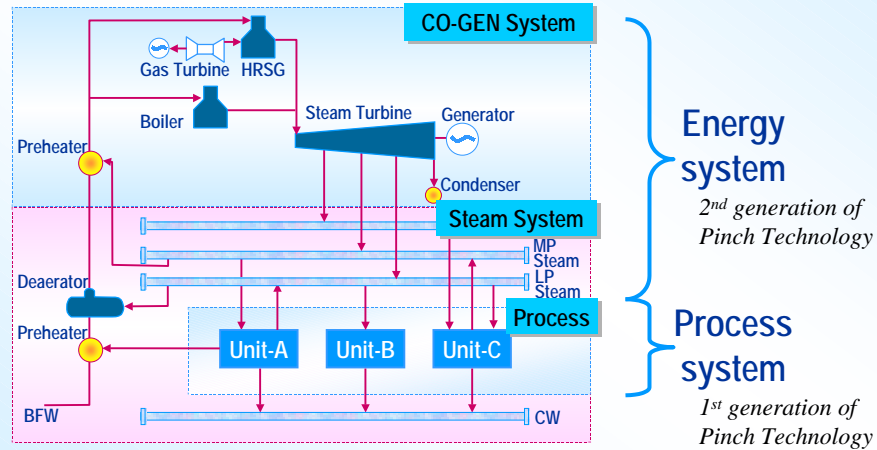
January 19, 2004
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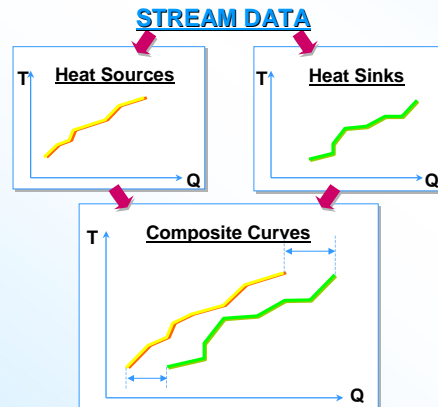
The site consists of energy system and process system



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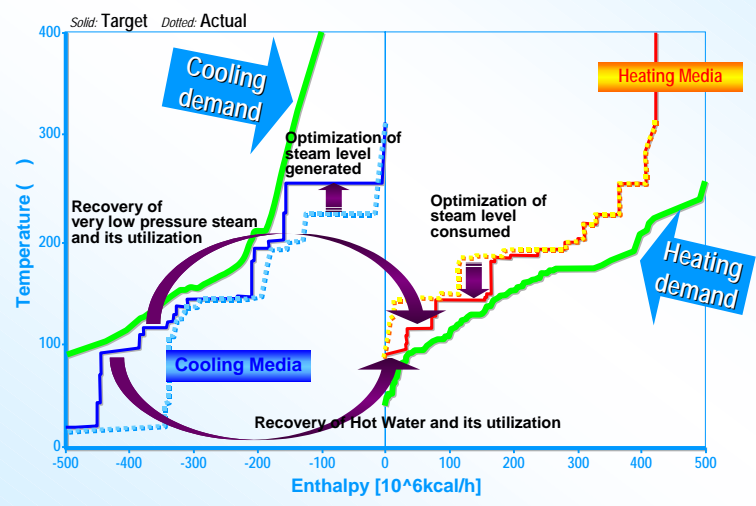
Feature of Pinch Technology

- Pinch Technology can show a potential of energy saving and suggest a RoadMap of energy saving strategy in a site, which is achieved by analyzing a composite curves and SSSP as well.

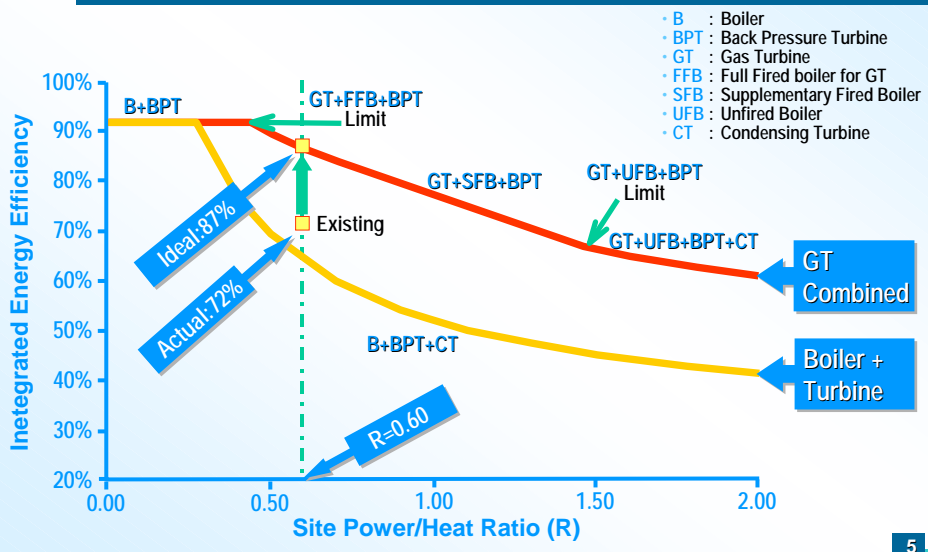


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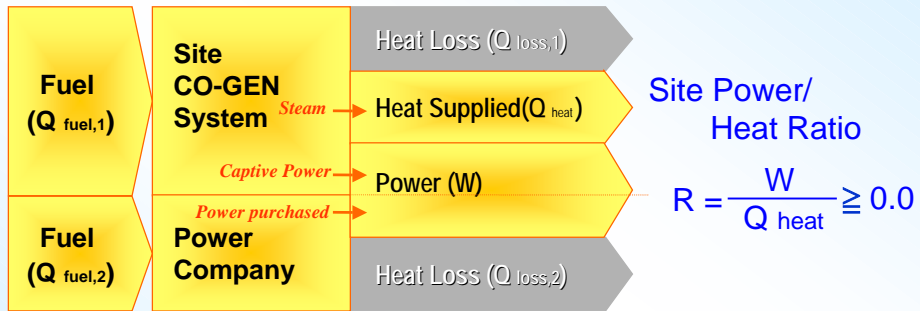
Analysis technique 1: Site Source and Sink Profile (SSSP) Analysis



Analysis technique 2: R-Curve Analysis



Definition of Integrated Energy Efficiency

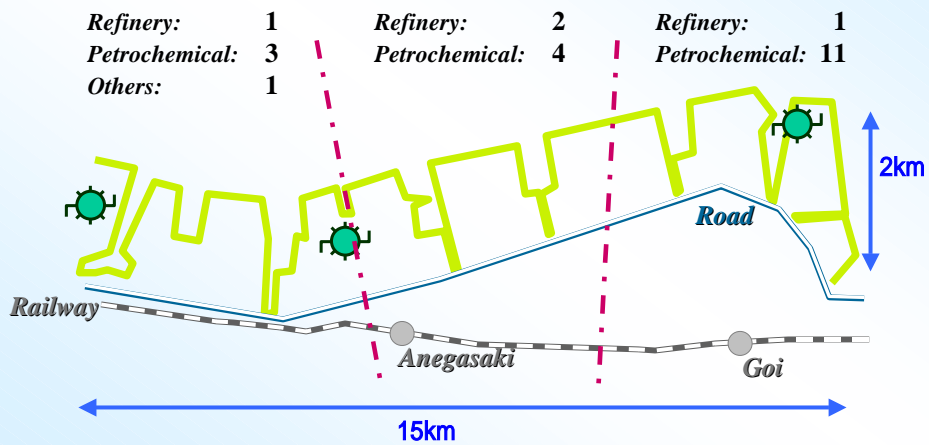


$$Q_{fuel} = Q_{fuel,1} + Q_{fuel,2} = Q_{heat} + W + Q_{loss,1} + Q_{loss,2}$$

$$\text{Integrated Energy Efficiency} = \frac{W + Q_{heat}}{Q_{fuel}} < 1.0$$

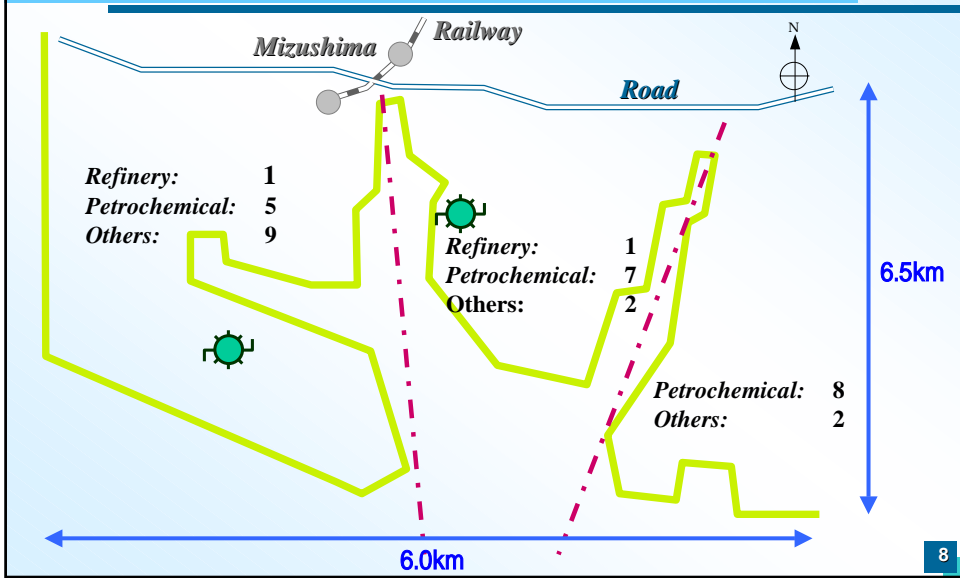
Example 1 of Pinch Analysis

Chiba industrial area (23 sites)



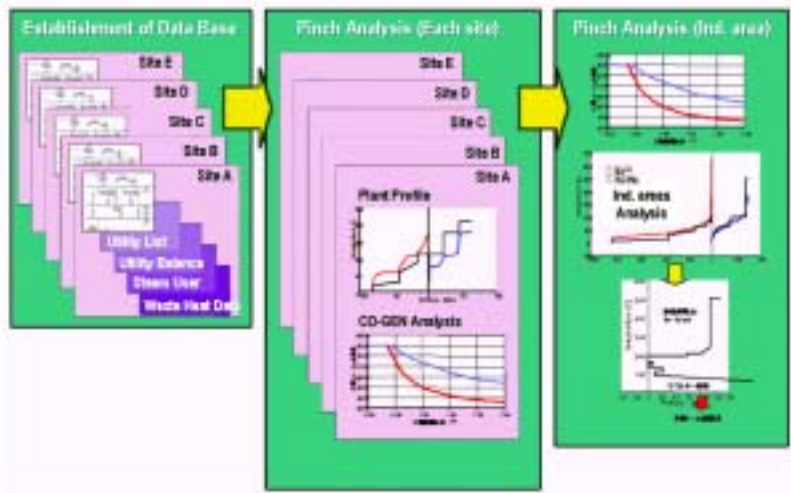
Example 2 of Pinch Analysis

Mizushima industrial area (35 sites)



Example of Pinch Analysis

Each site analysis → Industrial area analysis



Theoretical energy saving potential in Chiba and Mizushima industrial areas

unit : Annual Crude rate equiv. 年間原油換算量

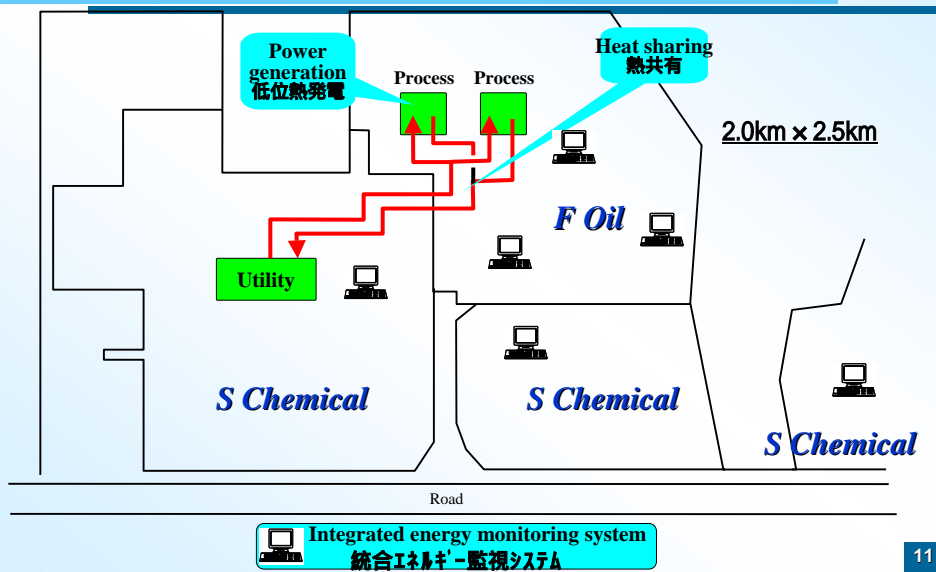
	Chiba	Mizushima	Mizushima / Chiba
1) No. of Sites 工場数	23	35	1.5
2) Integrated fuel Consumption (heat+power) 統合燃料消費量 熱+電気	2.88 million kL	3.50 million kL	1.2
3) Theoretical energy saving potential by optimizing energy system エネルギーシステム最適化での省エネ理論値	0.51 million kL	0.95 million kL	1.9
4) Theoretical energy saving potential by energy sharing 熱共有化での省エネ理論値	0.13 million kL	<i>Studying FY2003</i>	--
Total	0.64 million kL	Expected 1.20 million kL	
Domestic crude consumption 国内原油消費量	Equiv. to 1day 1日分相当	Equiv. to 2day 2日分相当	

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Chiba area : Energy sharing project

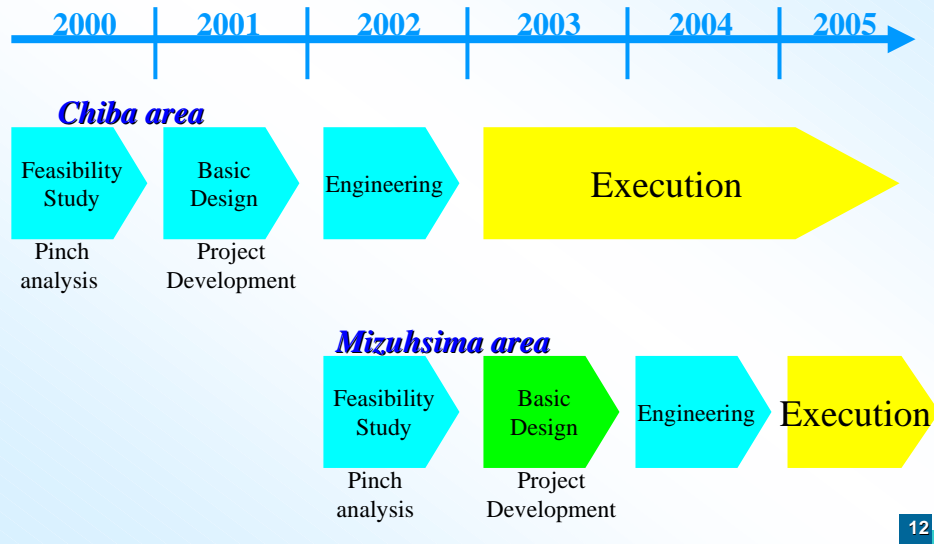
with lower heat between Refinery and Petrochemical

低位熱エネルギー統合回収技術開発事業



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The schedule of energy sharing projects in Chiba and Mizushima



Japan's major industrial 10 areas

