



District Cooling System (DCS) @ THE Forestias

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Presentation Topics

1. Introduction to **THE Forestias Project**
2. **Central Utility Plant (CUP)** at THE Forestias
3. **District Cooling System (DCS)** at THE Forestias
4. **Energy Savings** Calculation and **GHG Emission Reduction**

THE FORESTIAS

Office building, Community center, family life center,
4-star business hotel and serviced apartment



Mulberry Grove Residences



Forestias Forest



Medical Complex



Town Center



Whizdom Condo



6-star Boutique Hotel



Forest Pavilion



The Aspen Tree Residences

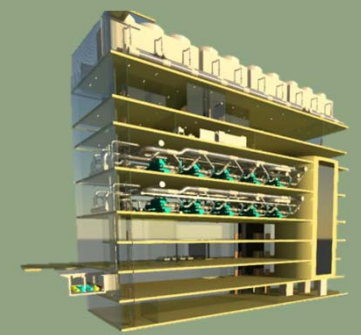


The First DCS Project of EECDT

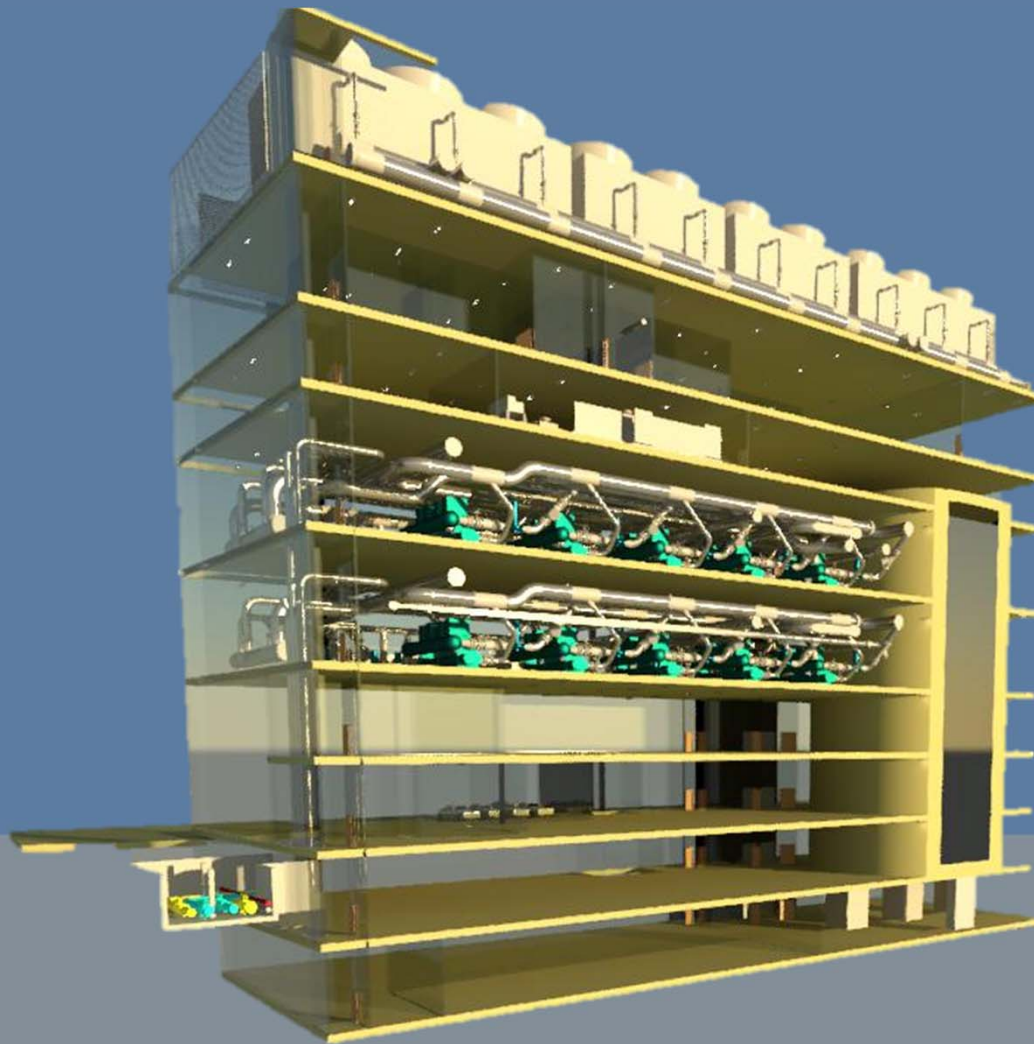


2. Central Utility Plant (CUP) at THE Forestias

CUP LOCATION



CUP INCLUDES;



Bidding Scope up to Phase 2, 2024

District Cooling Plant (till 2024)
10,000 RT and room for 10,000 RT

TES
26,000RT-h Chilled Water Storage

MES and BOP

Smart Control Center
• Control Room 24/7 monitor
• Situation room for use in natural or
manmade disaster

Smart
Control
contractor's
scope

Fire Protection System
830 m3, 2x1,500GPM (1 Electric, 1 Diesel)

Retail
contractor's
scope

Water and Waste Water System

Utility Tunnel for Piping Network

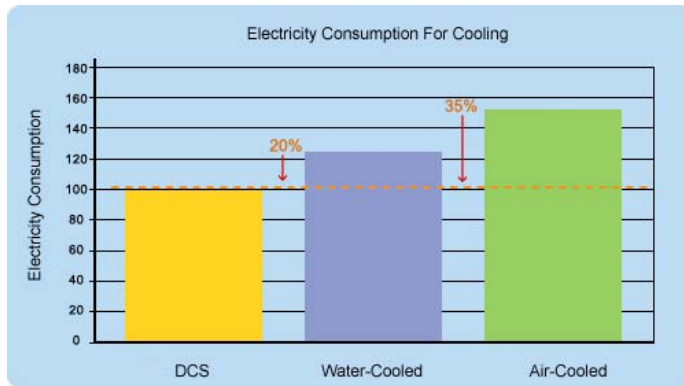
IFF
contractor's
scope

3. District Cooling System (DCS) at THE Forestias

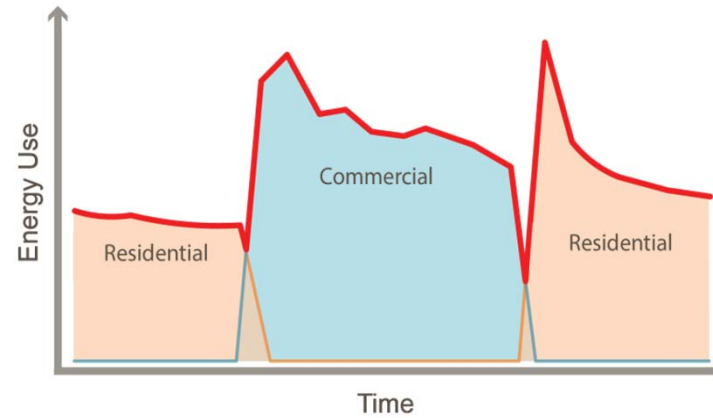
WHY

Why use DCS?

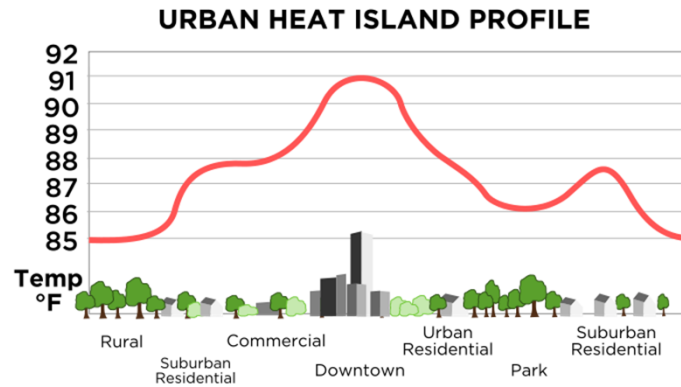
Customer benefits



Infrastructure benefits



Environmental benefits



Benefits of District Cooling System, DCS



- Having more outdoor space, no Condensing Unit



- No noise & heat rejection from CDU



- Low service & maintenance requirement



- Lower energy and maintenance expenses



- Having cooling supply when power outage



- Un-interruption to cooling supply
- Use water as refrigerant, no ozone depletion or global warming issue

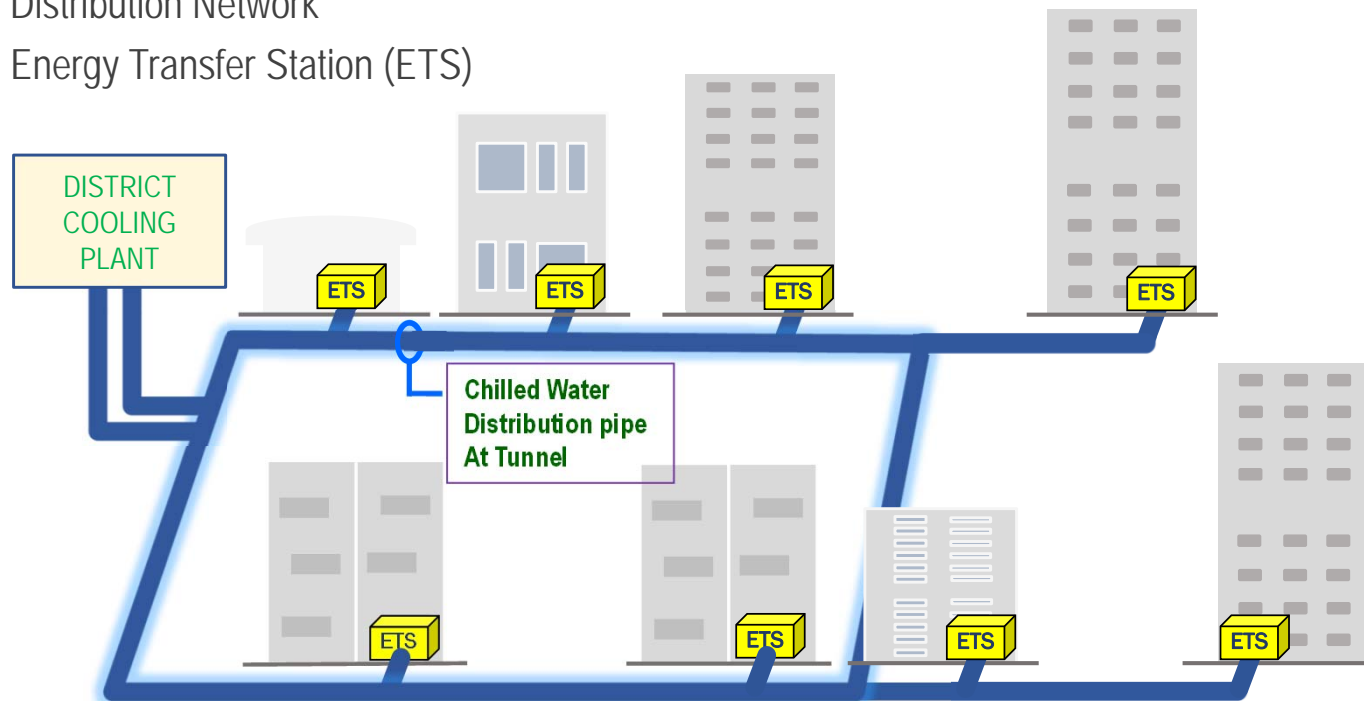
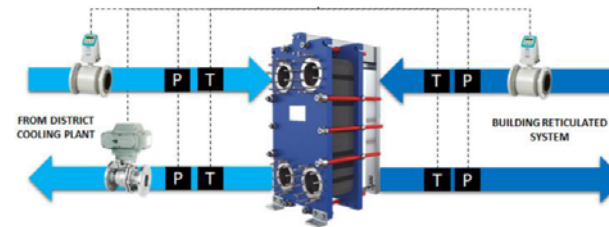


WHAT

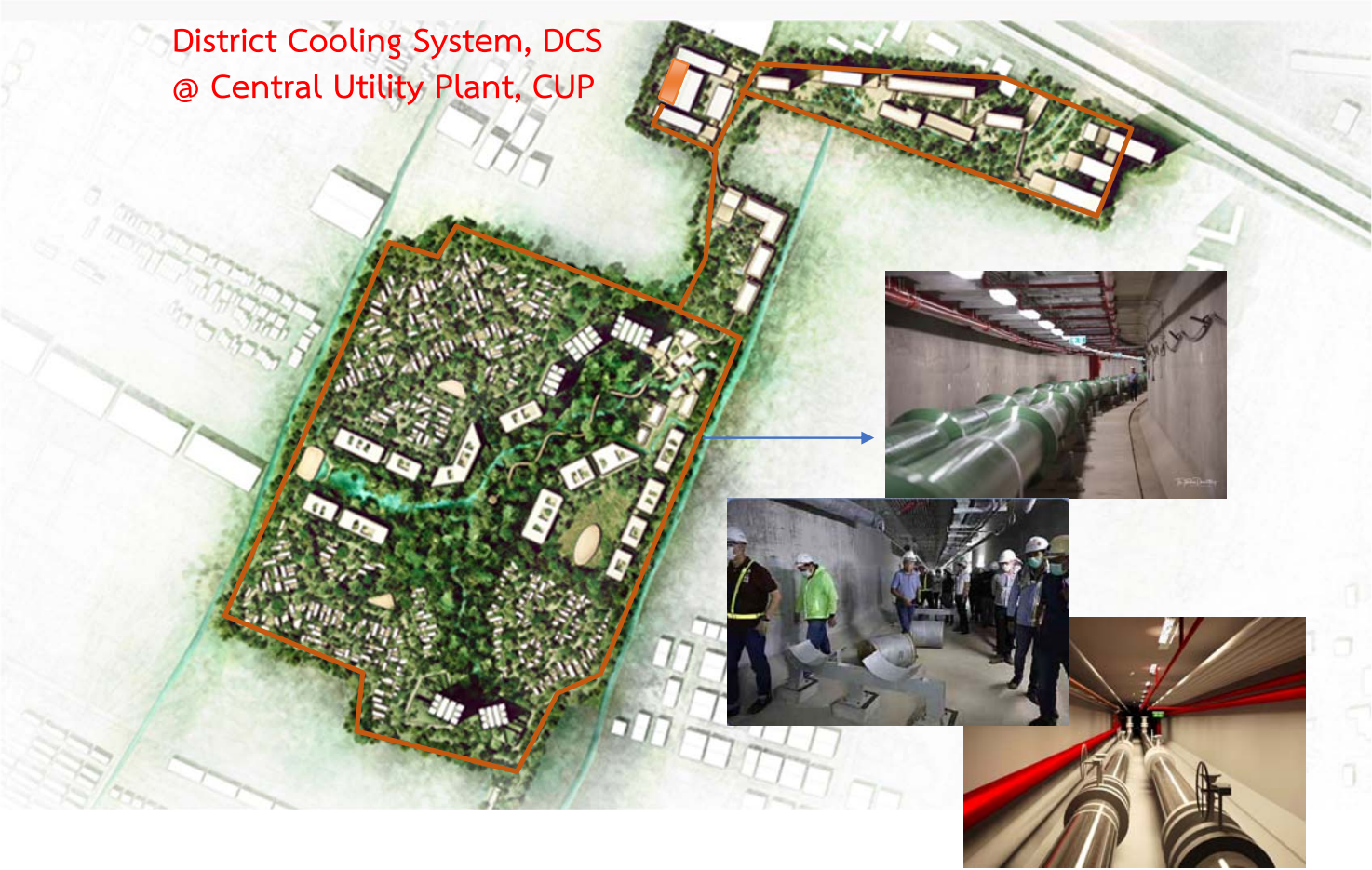
What is DCS?

DCS Components

1. Centralized Energy Plant
2. Distribution Network
3. Energy Transfer Station (ETS)



Distribution Network of DCS

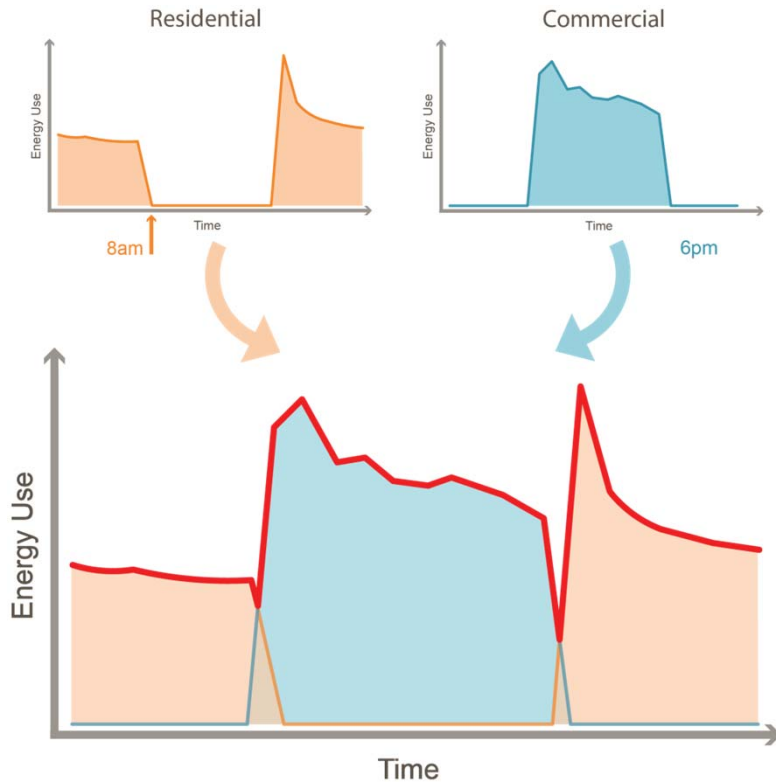


Distribution Network

Chilled Water will be distributed to each allotment through Distribution Network in **Utilities Tunnel**

4. Energy Savings Calculation and GHG Emission Reduction

Energy Savings and GHG Emission Reduction using DCS @ THE Forestias



1. Reduce **INSTALLED CAPACITY**

- Installed capacity using Conventional Air Conditioning System approx. **32,323 RT**
- Installed capacity using DCS approx. **20,000 RT**

2. Reduce **ENERGY CONSUMPTION + GHG Emission Reduction**

- System performance of Conventional Air Conditioning System **1.16 – 1.46 kW/RT**
- System performance of DCS **less than 0.75 kW/RT**

2. Reduce **REFRIGERANTS + GHG Emission Reduction**

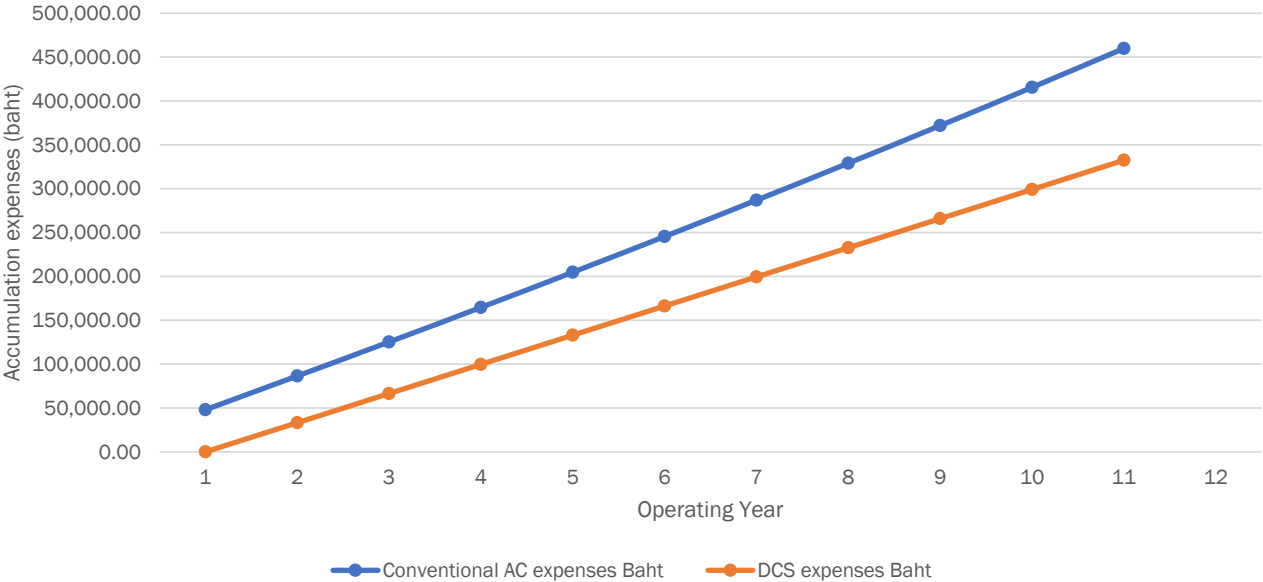
- Amount of GHG from refrigerants in Conventional AC System (R410A 20,428 kg and R134a 21,120 kg) approx. **= 66,749 tCO_{2e}**
- Amount of GHG from refrigerants in DCS (R134a 22,000 kg) approx. **= 28,600 tCO_{2e}**

Expenses comparison for Residential

SUMMARY RESULTS

	Conventional AC System Baht	District Cooling System, DCS Baht	Savings Baht	% savings %
Average energy cost/month	3,015.74	2,770.33	245.41	-8%
Average energy cost / year	36,188.92	33,244.01	2,944.91	
Average expenses / year	41,188.92	33,244.01	7,944.91	-19%

Cost Comparison between Conventional AC and DCS

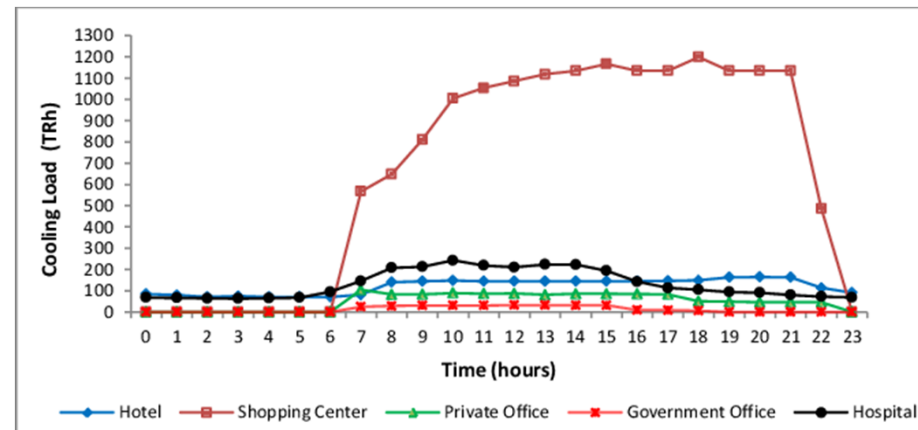


Conclusion

DISTRICT COOLING SYSTEM

- Energy Efficiency
- Spatial Requirement
- Operating Cost
- Reliability
- Flexibility
- Maintainability
- Sustainability

- Load sharing
- High performance
- Peak demand management
- Central Utility Plant



Thank You

