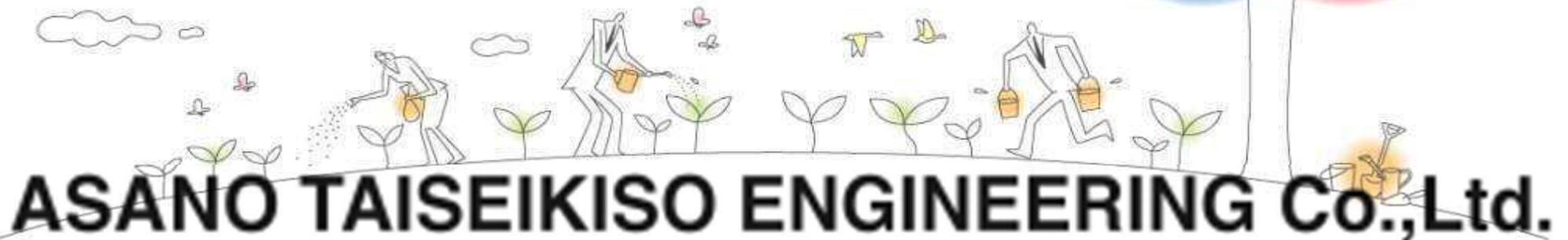
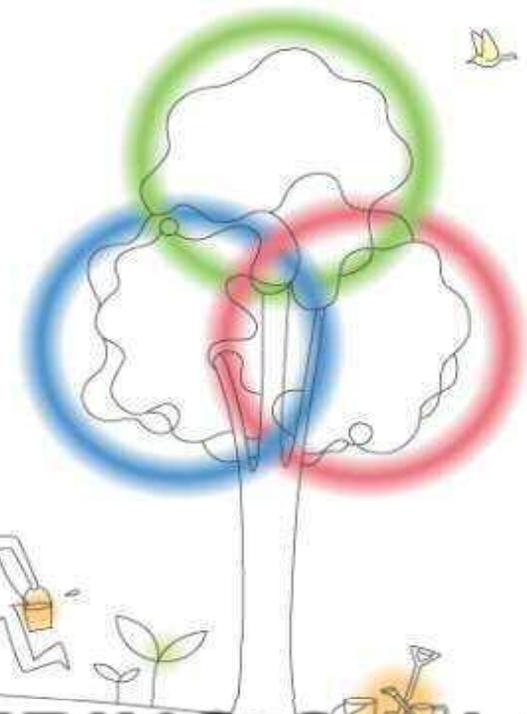


Using Innovative Heat-Exchange Technology in Industrial Wastewater in Vietnam

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TSUYOSHI SHIGA

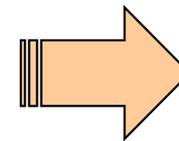
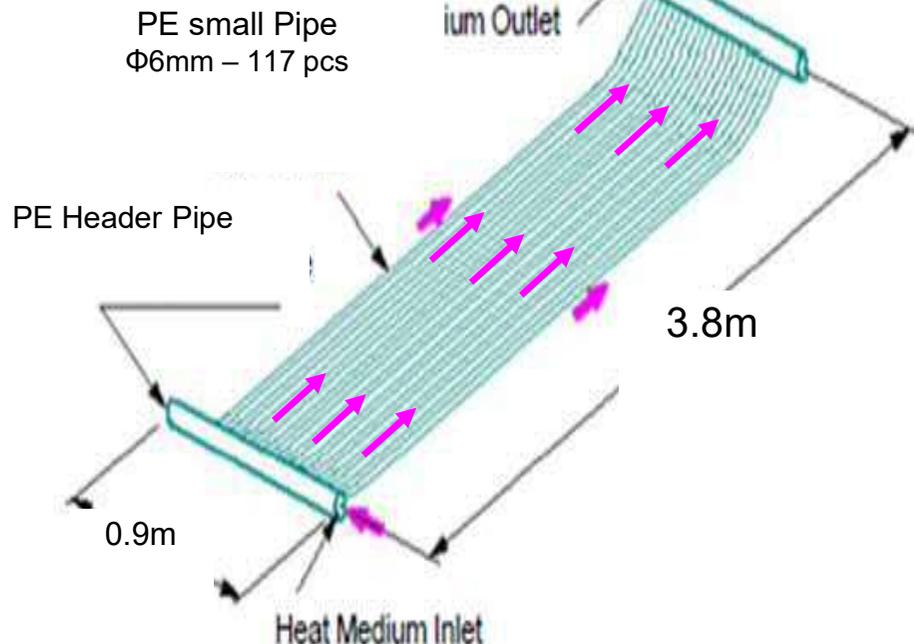


1. Outline of Installed System

■ Proposed System

- ✓ Highly Efficient Heat Exchange
- ✓ No corrosion and rust by wasted water
- ✓ 50 years durability (made of **Poly Ethylene Resin**)

P.E. Heat Exchanger (G-Hex)



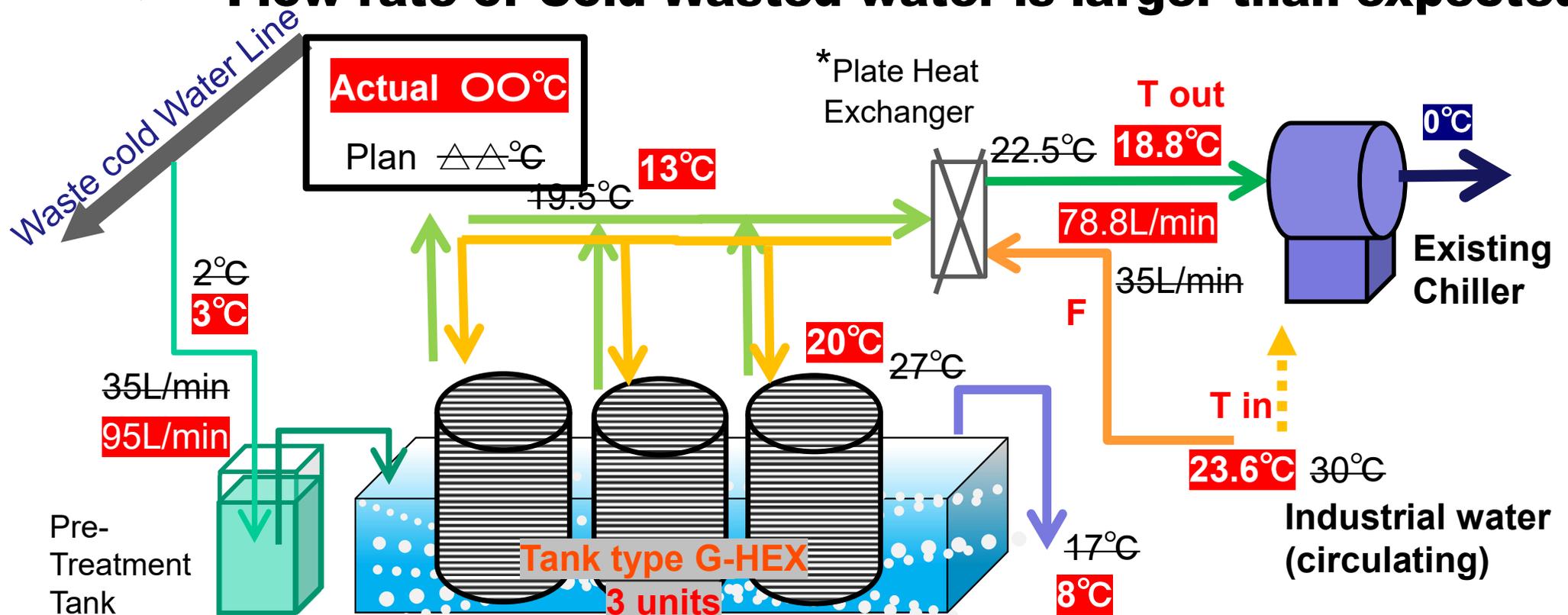
Roll up



1. Outline of Installed System

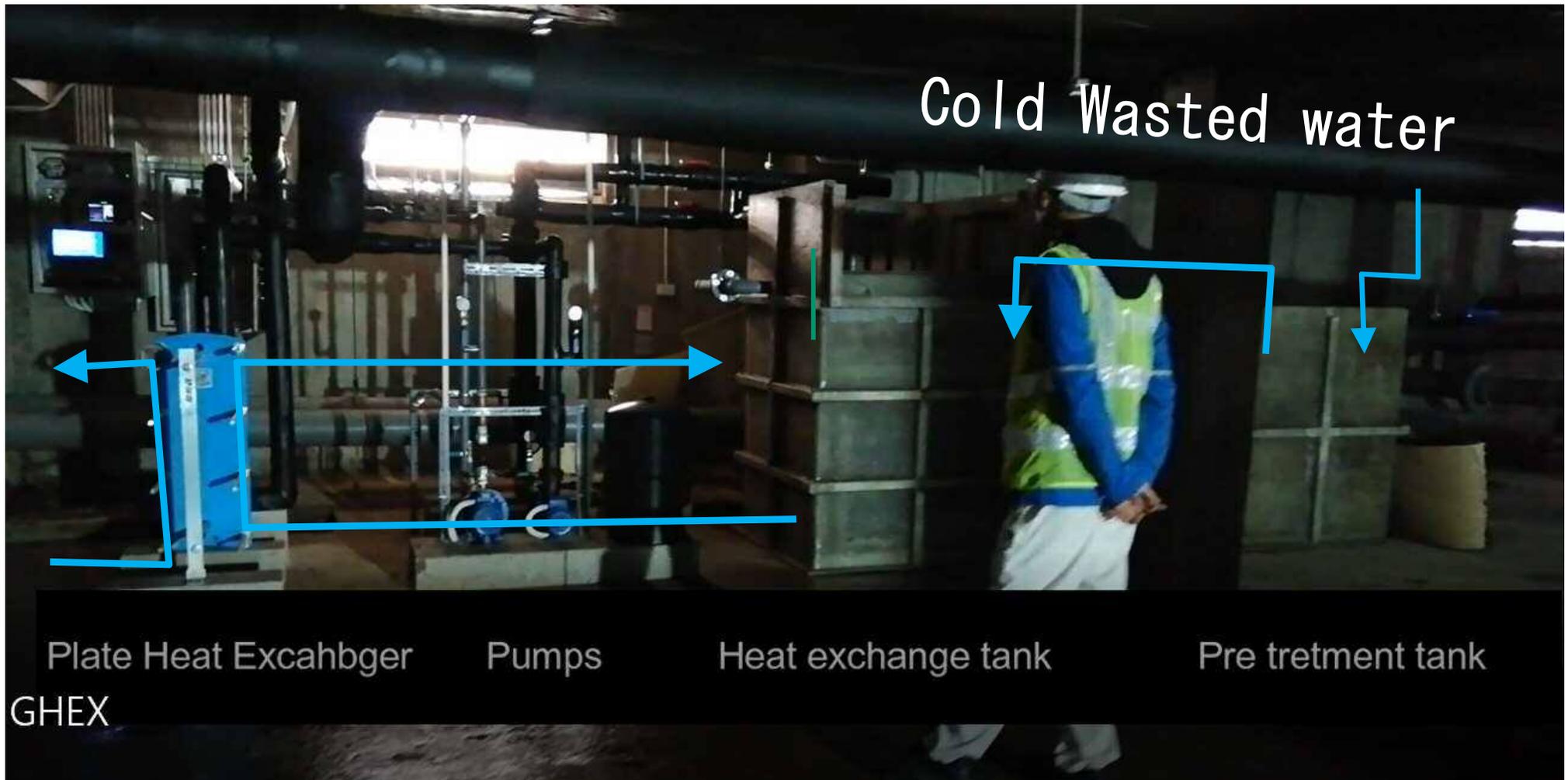
■ Installed System

- ✓ **Temperature of Industrial Water is lower than expected**
- ✓ **Temperature of Cold wasted water is higher than expected**
- ✓ **Flow rate of Cold Wasted water is larger than expected**



1. Outline of Installed System

■ Photos



2. Performance & Challenges

Electric Fee as : 0.07342 USD/kWh

73.42 USD/MWh

■ Performance- Cost Benefit

Items	Annual Electric Consumption MWh / yr	Annual Electric Fee USD / yr	Annual CO2 Emission (ton)
Existing Chiller	615.349	45,179	502
Existing Chiller with G-Hex	492,279 (20 % less)	36,143	402
Advantage	110.763	9,036	100

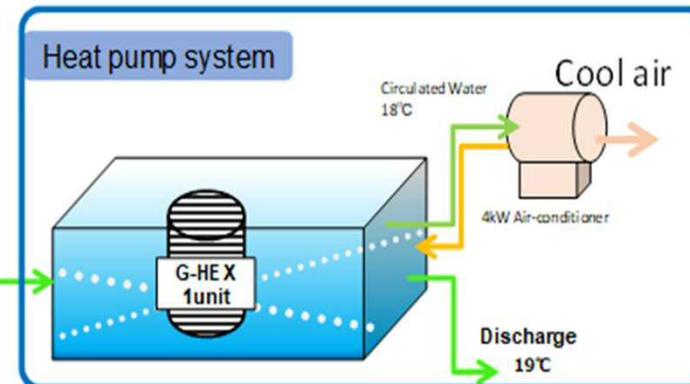
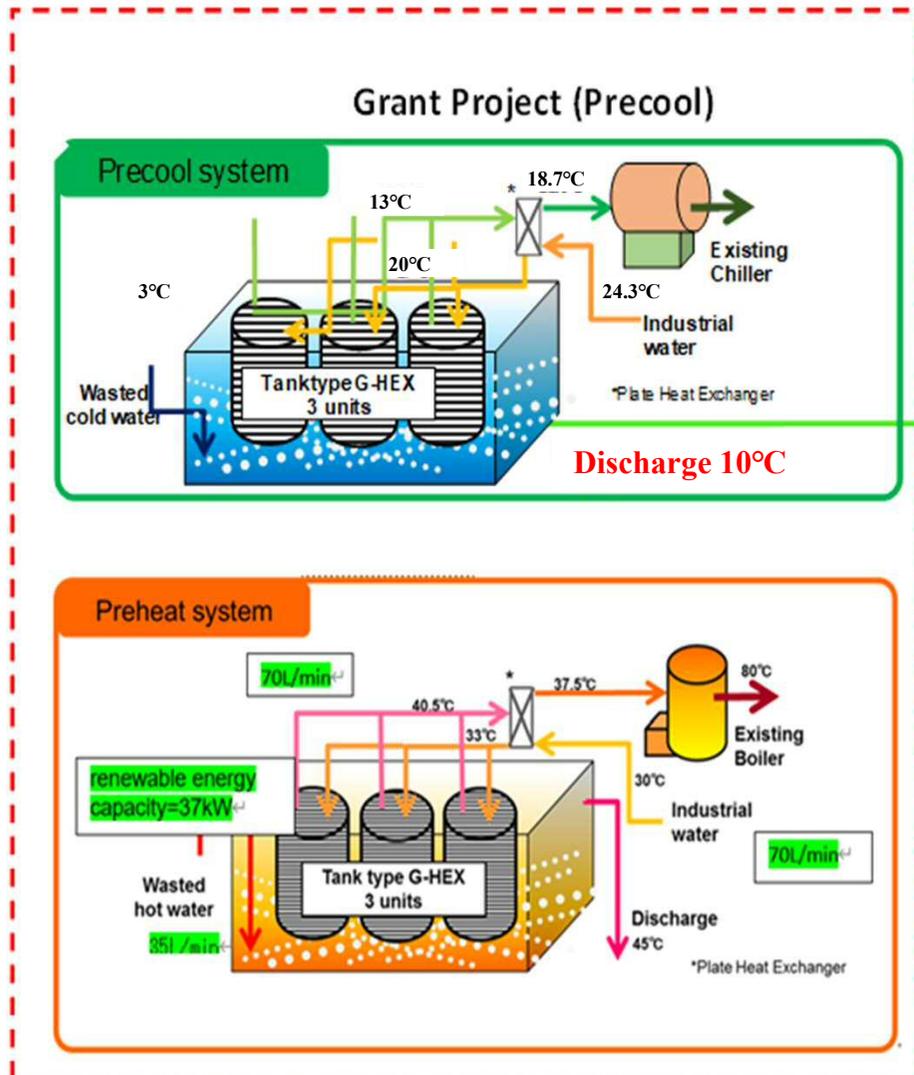
Status	Initial Cost (USD)	Main Equipmen t	Tanks, Piping, Electric Work	Transport & Custom	Payback Time
Curren t	59,255	34,909	18,309	6,007	6.6 years
Future	47,553	23,887	17,659	6,007	5.3years



3. Future Vision

■ Pre-Cool & Pre-Heat & Air Conditioning

Full Scale (Precool + Preheat)



- **Pre Cool : 24.3 °C to 18.7 °C**
➔ **20 % Electricity Reduction**
- **Pre Heat : 24.3 °C to 29.9 °C.**
➔ **11% Fuel Reduction**
- **Plus : Air Cond. for Room cooling**

3. Future Vision

■ Other Application



➤ **Shrimp Processing Factory**



➤ **Fish Processing Factory**



➤ **Textile Factory, Dyeing Process**

Thank you for your attention!

