

Introduction of Heat recovery heat pumps in Thailand

(Case study)

CPF (Thailand) Public Company Limited.
&
CPF JAPAN Public Company Limited.

11th September 2018

1. Introduction

1-1 CP Group (THAILAND)

Outline of CP Thai



Charoen Pokphand Group
Asia's leading globally committed conglomerate

米国 Forbes誌 2011年
ビジネスマンオブザイヤー受賞
CPグループ会長 謝国民

Agriculture/Food business



Charoen Pokphand Foods
The most largest company in
Asia about Feed mill

Retail



CP All
7-11 Thailand
About 9,500 shop

IT/Telecom



True Corporation
The most largest
company about Telecom
in Thailand

Real estate



CP Land

Other

Distribution
Food service /Restaurant
Gasoline
Motor bike/Car production
Insurance
International Trade
Etc.



家畜飼料 世界TOP5

順位	社名	生産量 百万トン
1	CP グループ (タイ)	23.2
2	カーギル (米国)	15.9
3	新希望集団 (中国)	13.0
4	LAND O'LAKES (米国)	10.1
5	TYSON FOODS (米国)	10.0

出所: Forbes Asia 2011年12月号

1. Introduction

1-2 CP CHIA TAI (CHINA)

Outline of CP China



アジア最大級 ショッピングモール
「正大広場」



Shanghai Shopping mall

Agriculture/Food



CP Pokphand
Leading company in CHINA
Feed mill, livestock, food processing
5 billion CNY

Retail



CP Lotus
About 78 store GMS
10 billion CNY

IT/Telecom



Shanghai Chiatai
JV company from Shahani TV

Other



Distribution
Food service / Restaurant
Gasoline
Motor bike/Car production
Insurance
International Trade
etc

Medicine

Sino
Biopharmaceutical
14 billion CNY



SINO BIOPHARMACEUTICAL LIMITED
中國生物製藥有限公司

Real estate



正大置地
土地開發会社

1. Introduction

Introduction of CPF JAPAN



Name : CPF JAPAN Company Limited

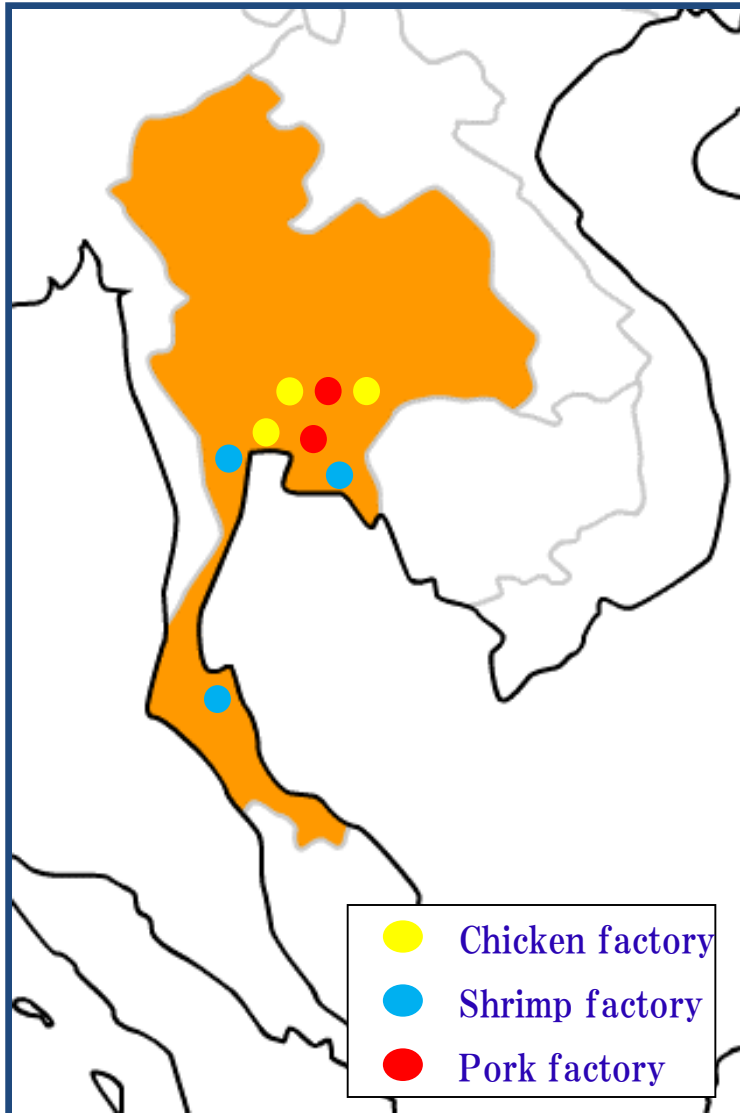
Address : Chiyoda Kioicho1-3 TOKYO JPN

Main business : 1) Sales product of CPF
2) Raw and Cooked product
3) Processing foods

Total employee : 10person



● Factory Location



● Chicken factory

No.	Plant	Slaughter	MT
1	Saraburi	196,000	3,100 t
2	Minburi	170,000	2,600 t
3	Korat	230,000	4,000 t
Total amount		596,000	9,700t

● Shrimp factory

No.	Plant		MT
1	TPCC	56t	884t
2	KLANG	72t	1,118t
3			
Total		183t	2,860t

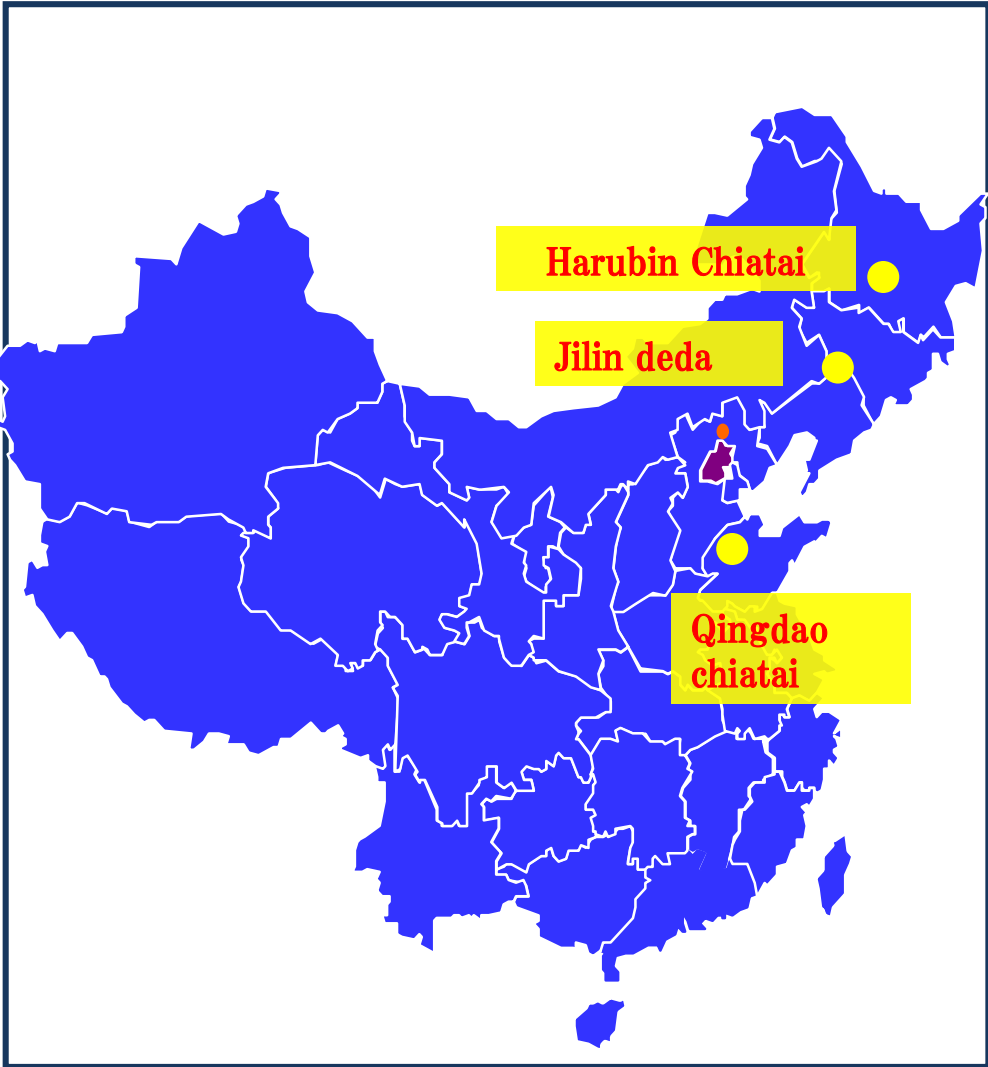
● Pork factory

No.	Plant	Slaughter	MT
1	CPP	-	2,550t
2	BKP3	-	780t
Total		2,000	3,330t

1-4 CP CHIATAI (CHINA)

● Factory Location

QINGDAO	
Equipment	Steam, Fry , charcoal
Main product	Charcoal /Fried chicken /Roasted chicken
Total	1,500ton /month
Export	700ton/month
JILIN	
Equipment	Steam , Roast, Fry, Charcoal
Main product	Charcoal /Fried chicken /Roasted chicken
Total	1,050ton/month
Export	600ton/month
HARUBIN	
Equipment	Steam , Roast,Fry, Charcoal
Main product	Charcoal /Fried chicken /Roasted chicken
Total	1,500ton/month
Export	600ton/month



1-5 CPF JPN MARKET (CVS)



CPF JAPAN CO.,LTD



CHILEED



SALAD CHICKEN

WEIGHT 115g
SALE PRICE 298yen
COOKING Re-cook



GINGER PORK

WEIGHT 90g
SALIING PRICE 249yen
COOKING Microwave



PORK BELLY

WEIGHT 130g
SELLING PRICE 298yen
COOKING Microwave



FROZEN



Charcoal grill chicke

WEIGHT 140g
SELLING PRICE 213yen
COOKING Microwave



Fried Middewing

Weight 120g
Selling price 240yen
Cooking Microwave

1-6 CPF JPN MARKET (Foodservice)



CPF JAPAN
CO.,LTD



ルとよく合います。お好みでかけて、味と香りをお楽しみください。



Golden Spicy Chicken 4本 249円
辛味チキン 6本 359円
(1本約 80kcal / 200g以上)

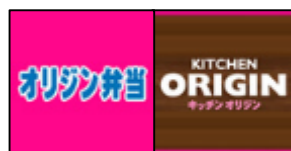
SPICY MIDDLE WING
PRICE 4pcs 249yen、6pcs 359yen



SPICY TWO JOINT WING
4pcs 380yen



SPICY TWO JOINT WING
3pcs 290yen



CHICKEN TATSUTAAGE
362yen / 380yen



Roasted wing stick
4pcs 540yen

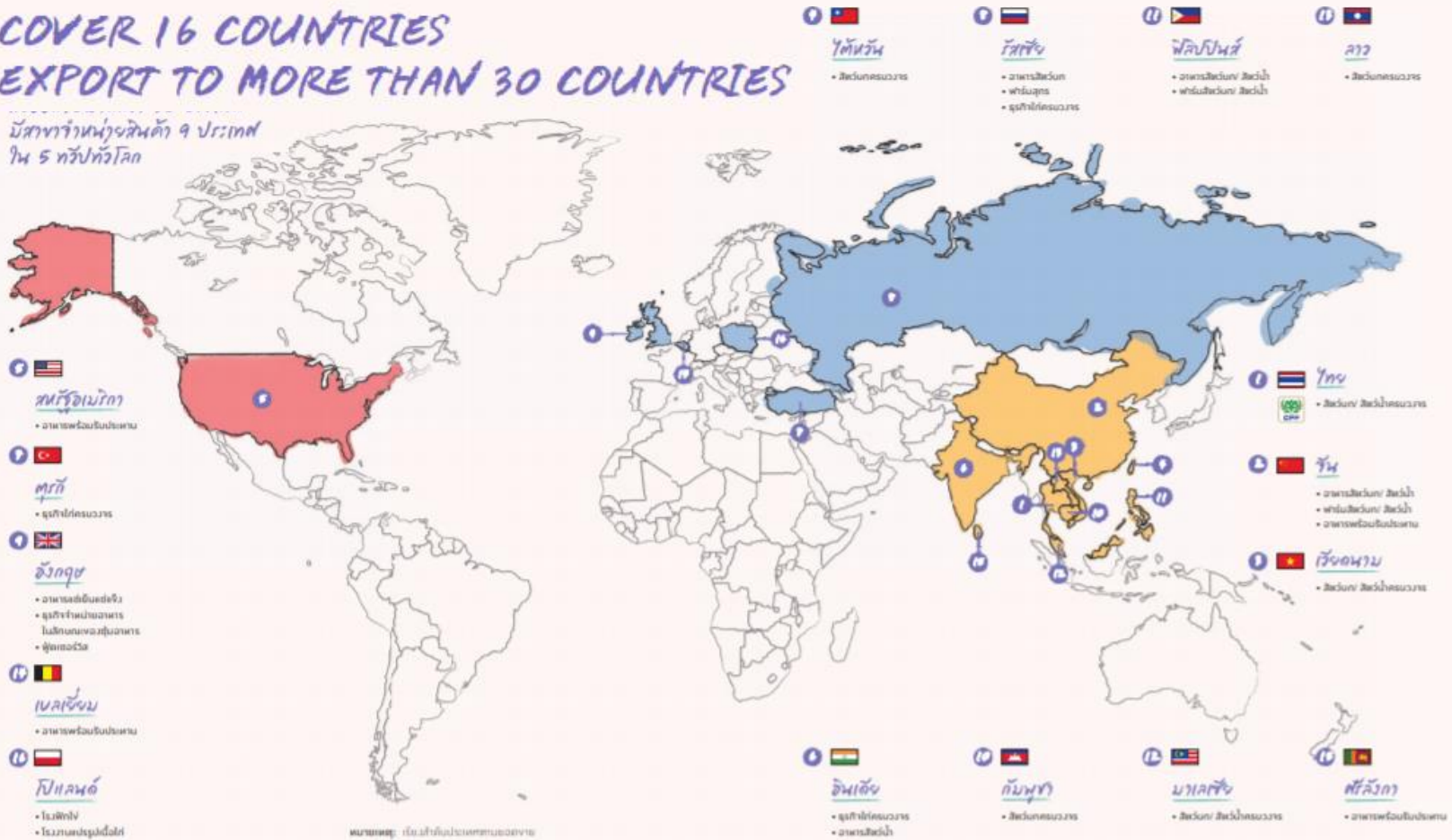
1. Introduction

CPF... KITCHEN OF THE WORLD

COVER 16 COUNTRIES

EXPORT TO MORE THAN 30 COUNTRIES

มีสาขาจำหน่ายสินค้า 9 ประเทศ
ใน 5 ทวีปทั่วโลก



1. Introduction

Food Security

Self-Sufficiency

Balance of Nature



LEAD THE WAY
to SUSTAINABILITY

<https://www.cpfworldwide.com/th>

“อาหารมั่นคง สังคมพึ่งตน และดินน้ำป่าคงอยู่” 3 เสาหลักแห่งความยั่งยืนของซีพีเอฟ ถือเป็นจุดเริ่มต้นของการเปลี่ยนผ่านสู่การบริหารความสัมพันธ์และความเชื่อมโยง ครอบคลุมในทุกมิติทั้งด้านเศรษฐกิจ สังคม และสิ่งแวดล้อม

ผลจากความมุ่งมั่นและพัฒนาการดำเนินงานด้านความยั่งยืนอย่างต่อเนื่อง ส่งผลให้ซีพีเอฟได้รับคัดเลือกเป็นสมาชิก Dow Jones Sustainability Indices : DJSI ประเภท Emerging Markets ประจำปี 2560 ต่อเนื่องเป็นปีที่ 3 ก้าวต่อไปบนเส้นทางความยั่งยืน ด้วยวิสัยทัศน์ “ครัวของโลก” ซีพีเอฟยังคงมุ่งมั่นสานต่อภารกิจ สร้างเสริมสมดุล ส่งต่อทุกคุณค่า เพื่อให้ทุกคำมีความหมาย เพื่อทุกชีวิตที่ยั่งยืน

Charoen Pokphand Foods Public Company Limited



MEMBER OF

**Dow Jones
Sustainability Indices**

In Collaboration with RobecoSAM

DJSI MEMBER
2017
3 ปีต่อเนื่องบนเวที
ความยั่งยืนระดับโลก

2. Sustainable development for CPF



อาหารมั่นคง

ยกระดับคุณภาพและความปลอดภัยตลอดกระบวนการ
ส่งเสริมการเข้าถึงอาหาร

สังคมพึ่งตน

พัฒนาคู่ค้าธุรกิจให้เติบโตไปด้วยกัน
ส่งเสริมคุณภาพชีวิตของชุมชน

ดินน้ำป่าดงอยู่

บรรเทาผลกระทบต่อสิ่งแวดล้อม
ปกป้องความหลากหลายทางชีวภาพ

FOOD SECURITY

Enhancing Food Safety and Quality throughout the Chain
Improving Food Access

SELF-SUFFICIENT SOCIETY

Developing Win-Win Partnership
Supporting Community Livelihood

BALANCE OF NATURE

Reducing Environmental Footprints
Protecting Biodiversity

2. Sustainable development for CPF

Food Security



2. Sustainable development for CPF

Self Sufficiency



CPF CONTACT FARMING



FIVE STAR FRANCHISE



CP COMMUNITY REFRIGERATOR

CREATING
ECONOMIC VALUE
EQUIVALENT TO MORE THAN
USD 572 MILLION
ANNUALLY



CP COMMODITY PORK FRIDGE PROJECT

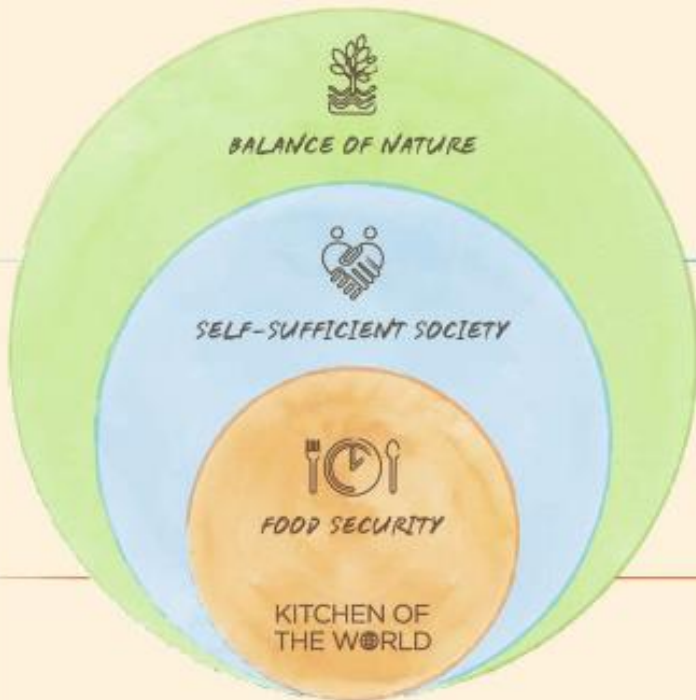
2. Sustainable development for CPF

Balance of Nature



2. Sustainable development for CPF

THREE PILLARS TO SUSTAINABILITY



GOALS

TARGETS



REDUCING
ENVIRONMENTAL
FOOTPRINTS



Reduce energy consumption per production unit by 15% compared to the base year 2015.
Reduce GHG emissions (scope 1 and 2) per production unit by 15% compared to the base year 2015.



PROTECTING
BIODIVERSITY



Protect biodiversity in mangrove forest and watershed forest in strategic areas and green area within the boundary of operations covering the areas of 9,000 rai.



DEVELOPING
WIN-WIN
PARTNERSHIP



100% of critical suppliers in animal feed raw materials, food ingredients, and packaging groups are audited on sustainability.



SUPPORTING
COMMUNITY
LIVELIHOOD



Improve employment prospect and quality of life of 50,000 smallholder farmers, small entrepreneurs, and vulnerable groups.



ENHANCING QUALITY
& FOOD SAFETY
THROUGHOUT THE
CHAIN



No product recall incident that would affect public health.



IMPROVING
FOOD ACCESS

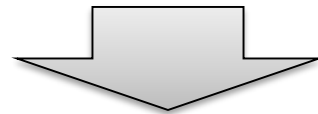


>300,000 of children and youth have the opportunity to access knowledge and skills on food production and/or on consumption of safe and nutritious food.

2. Sustainable development for CPF

GOALS	TARGETS
	<i>REDUCING ENVIRONMENTAL FOOTPRINTS</i>
	<u>Reduce energy consumption</u> per production unit by <u>15%</u> compared to the base year 2015. <u>Reduce GHG emissions</u> (scope 1 and 2) per production unit by <u>15%</u> compared to the base year 2015.
	<i>PROTECTING BIODIVERSITY</i>
	Protect biodiversity in mangrove forest and watershed forest in strategic areas and green area within the boundary of operations covering the areas of 9,000 rai.

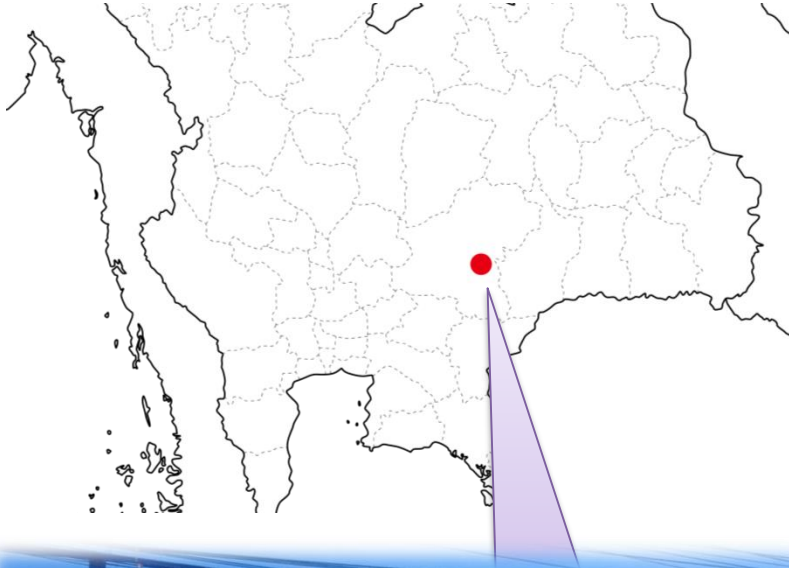
2. Sustainable development for CPF



CPF Product Sustainability Project

CPF (Thailand) Public Company Limited

Project site :Korat Factory (Slaughter House Processing Plant)



333,333/1-2 Moo 9, Sikhiu-Det Udom Road,
Tha Yiem, Chok chai, Nakhonratchasima
30190,Thailand



Fresh chicken and
chicken Appetizer



Teriyaki



Fresh Chicken



Chicken Leg

Product



CPF (Thailand) Public Company Limited



Refrigerator room



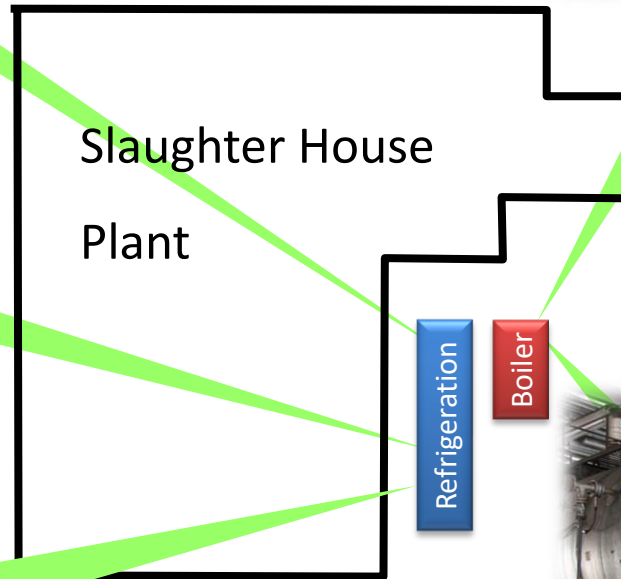
Boiler room



Large chiller



Compressor

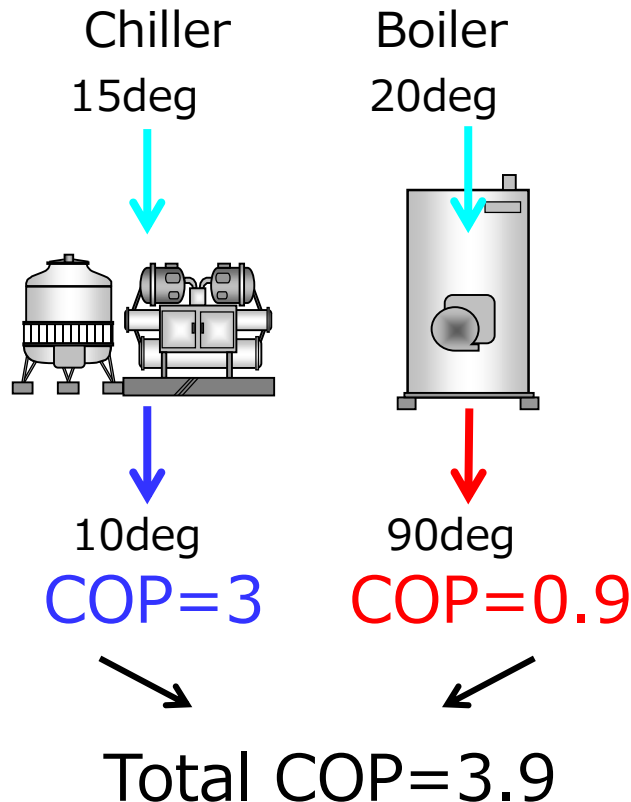


Boiler

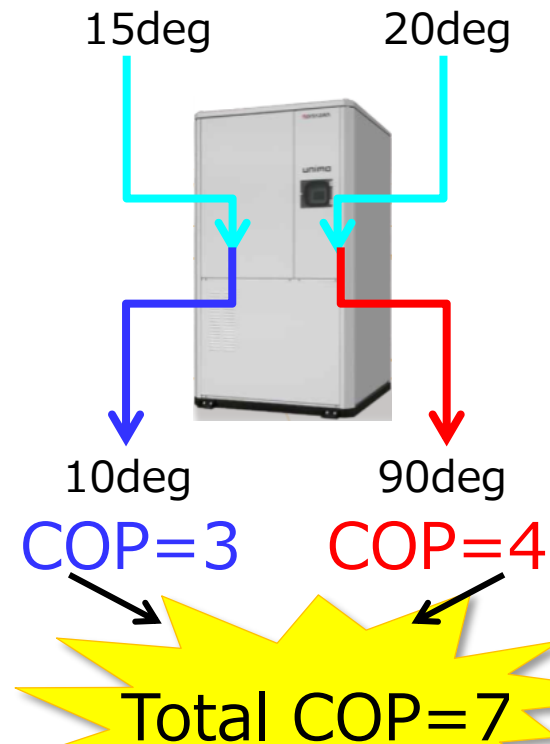
Background and heat pump technology

The proposed project is to foster energy efficiency activities mainly in the food & beverage sector in Thailand, by introducing heat recovery heat pumps that generate both heating and cooling energy simultaneously.

Standard System



Heat Recovery Heat pump System



Introduction of heat recovery heat pumps in manufacturing process

3. Introduction of Heat recovery heat pump

Schedule

2012~2013

2013~2014

2015

2016~2017

Energy saving survey (1st)

- Saraburi Factory
- Korat Factory

Energy saving survey (2nd detailed investigations)

- Korat Factory

Internal review

- Installation place
- Benefits of introduction
- Subsidy

Introduction of Heat pump



Installed technology

Project Name

Introduction of Heat Recovery Heat Pumps to Food Processing Factory

Host country

Thailand

Representative company

CPF JAPAN Company Limited

Cooperating company

CPF(Thailand)Public Company Limited



Meat processing factory



Heat Recovery Heat Pump Systems

Object for CO2 reduction

Reduction of power consumption and
Heavy oil consumption

Expected GHG Emission Reductions

990 tCO2/year

JCM Consortium structure

JCM International Consortium

Representative participant:
CPF JAPAN Company Limited

- Project management
- Create report

Partner participant
CPF(Thailand)Public Company Limited

- Introduction of heat pump equipment
- Data collection, Data management,
Data compilation



Cooperation

JCM Support

Equipment for heat pump

MAYEKAWA MFG.CO.,LTD.

- JCM Execution Support

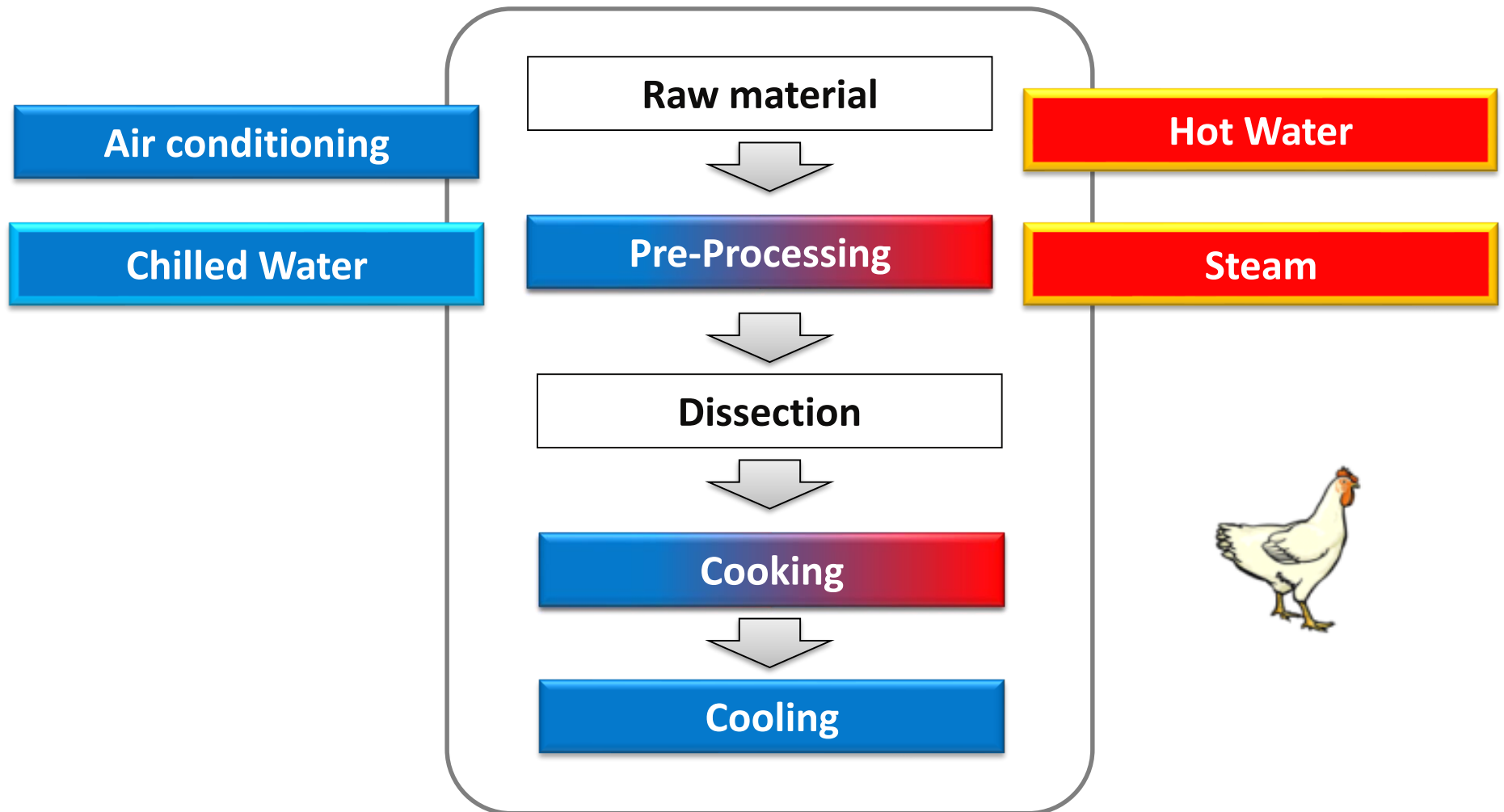
MAYEKAWA (THAILAND) CO.,LTD.

- Introduction of equipment

Order

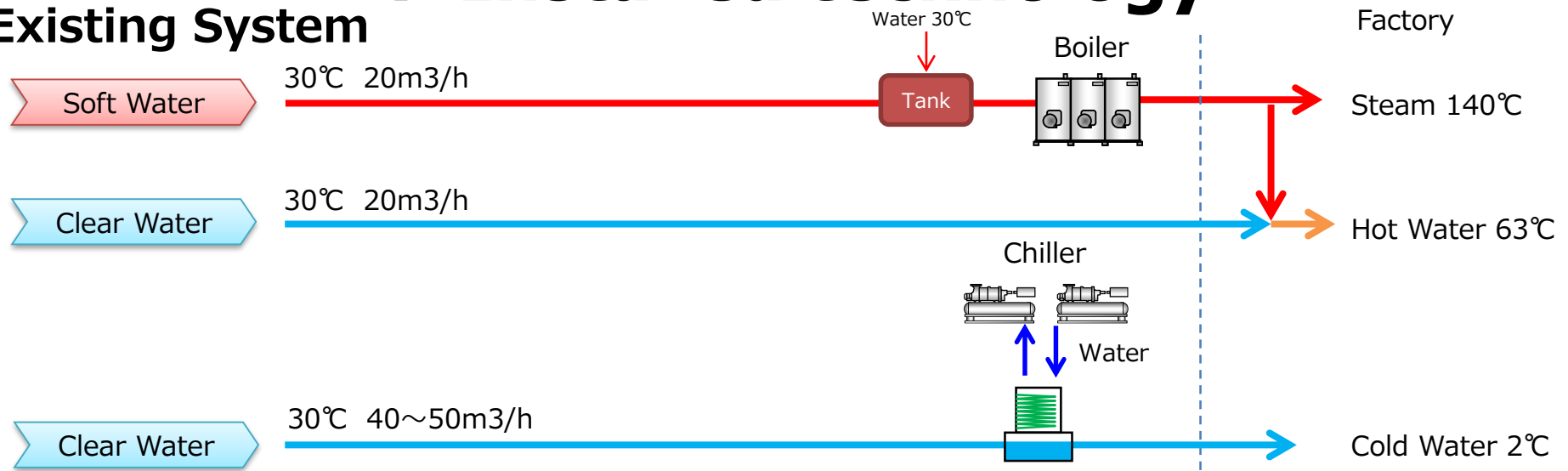
3. Introduction of Heat recovery heat pump

Processing Flow

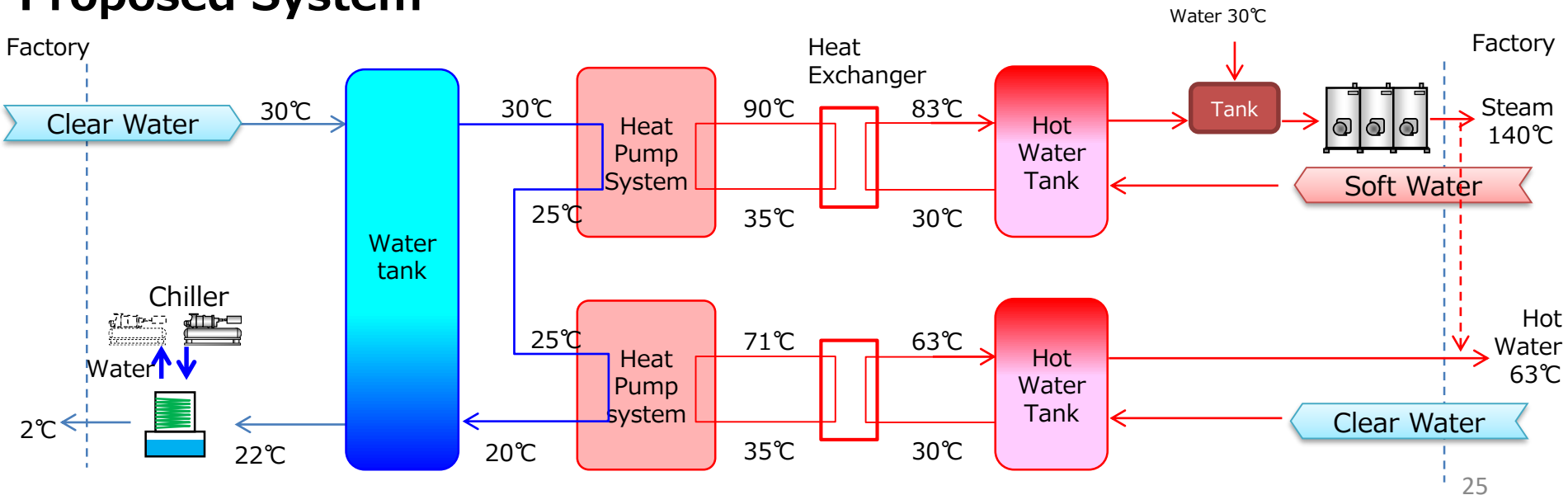


4. Installed technology

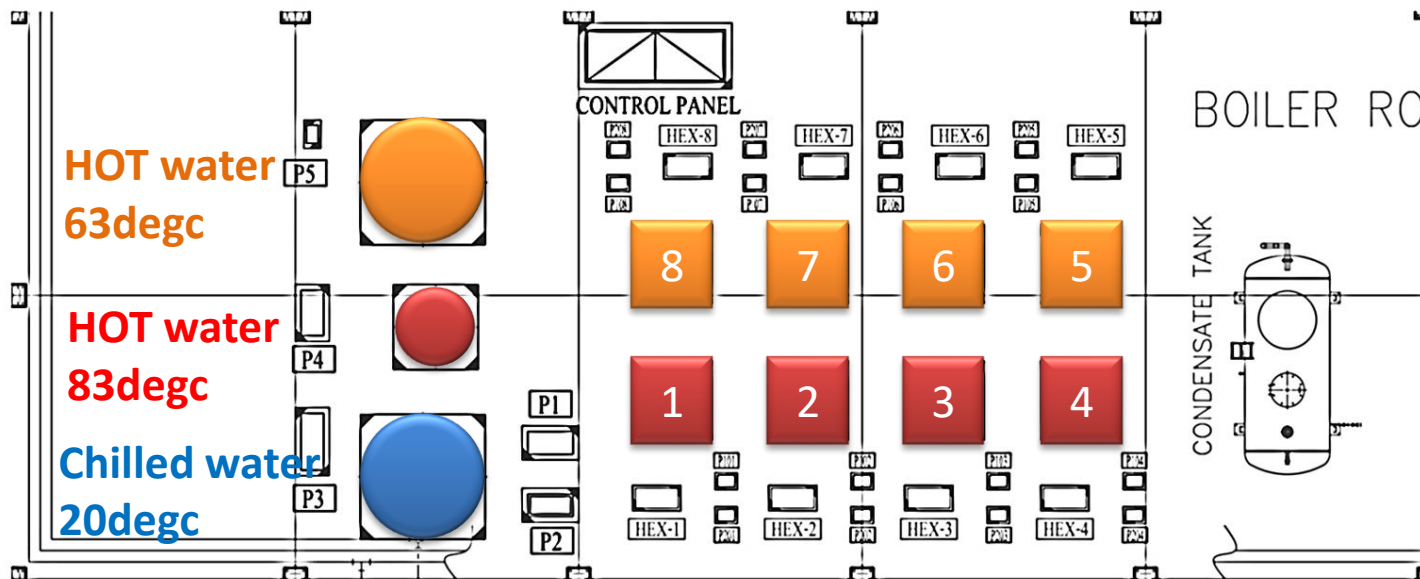
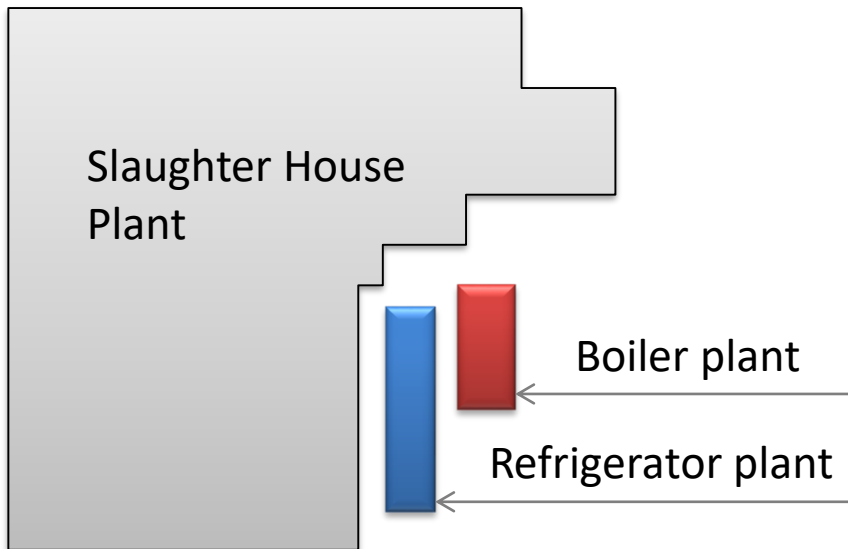
Existing System



Proposed System



5. Proposed System



Boiler room

5. Proposed System



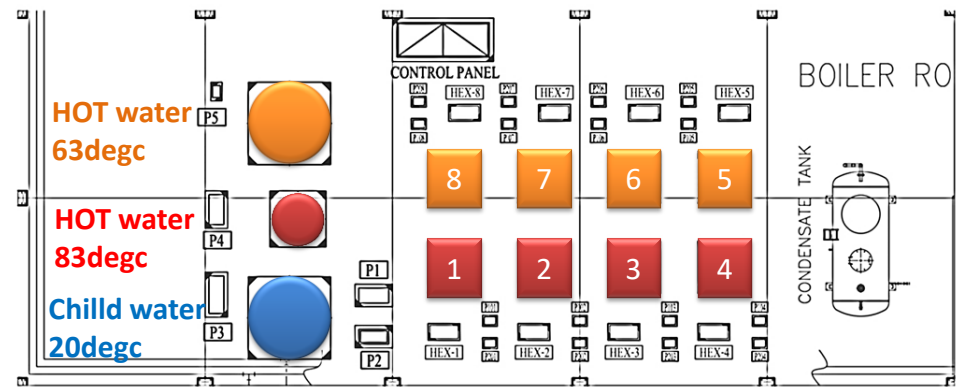
Water tanks



Control panel



Heat recovery heat pumps



Boiler room

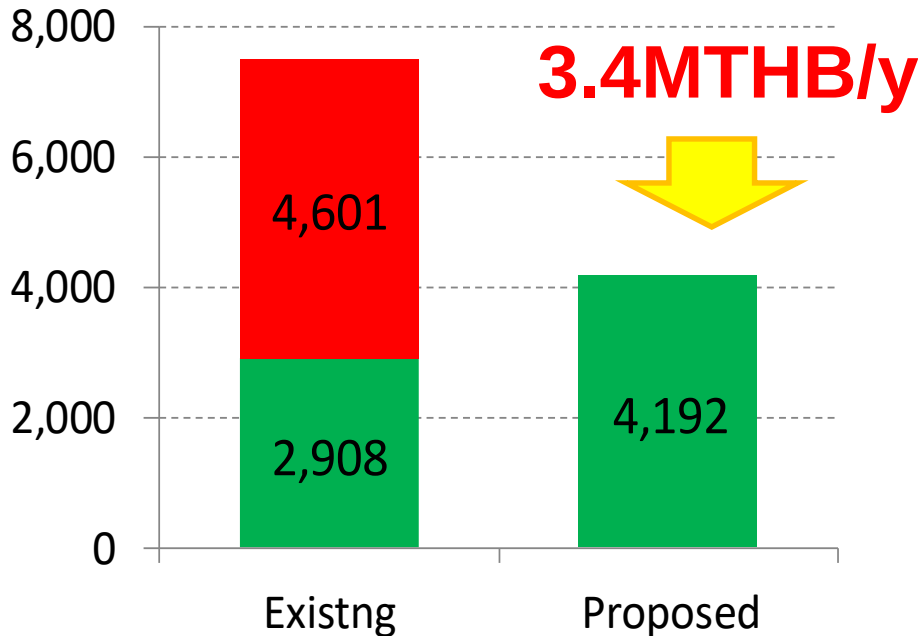
6. Benefits

	Proposal	Actual
Pay back period (yrs.)	5.3	3.7
Saving per year (THB/yr.)	2,400,000	3,400,000
CO₂ emission (ton-CO₂/yr.)	990	1,220

6. Benefits

Energy Cost

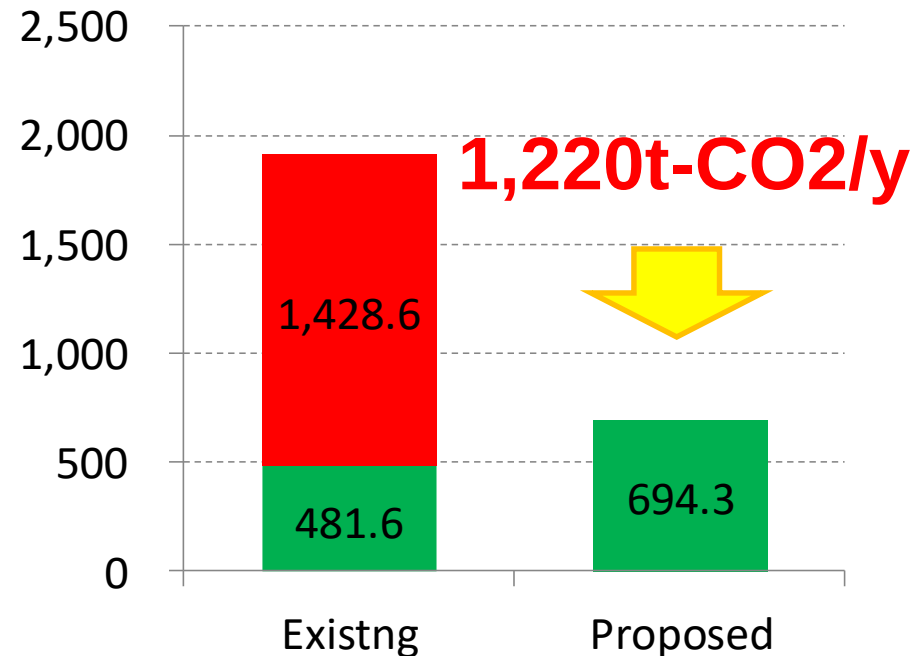
[× 1000THB/year]



Heavy Oil
Electric

CO2 emissions

[t-CO2/year]



Payback year 3.7 years

Fuel of Boiler	Heavy Oil
Heat Pump Q'ty	8
Running Hours	6000[h/year]

Energy Cost Rate : Electricity 3.42THB/kWh], Heavy Oil 9.67 [THB/L]
 Calorific Value : Heavy Oil 0.03977 [GJ/L]
 CO2 Emission Rate : Electricity 0.56643 [t-CO2/MWh], Heavy Oil 0.0755t-CO2/GJ
 Boiler efficiacy 80%, Chiller COP3.48

**Survey of latest technology on
energy saving and CO2 reduction**



**Energy saving seminar
(information dissemination)**



**Introduced "Heat recovery heat pumps" for
industrial applications using
natural refrigerant (CO2) for the first time in Thailand**



**Promote dissemination in Thailand
and neighboring countries**



Sustainable development for CPF

