



# Energy Saving for Air Conditioning System (Tung Pei Industrial Co., Ltd.)

**Etern**

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**TPI** 東培工業股份有限公司  
BEARINGS TUNG PEI INDUSTRIAL CO., LTD.



## Case information

**Location:** Taoyuan, Jungli

**Industry:** Bearings manufacturer

**Employees:** About 1900 employees

**Requirement:** Energy saving for ice and cooling water pumps

**Implementation:** Inverter control systems are designed for cooling and ice water pumps to reduce power consumption

## ◆ Equipment



40HP ice water pump\*3 + 40HP cooling water pump\*3

## ◆ Analysis

Item	Current	Estimate	Guarantee
Capability (HP)	240	240	240
Consumed (KW)	180.0	180.0	180.0
Loading avg.	50%	50%	50%
Energy saving (%)	-	50%	30%
Consumption (KWH)	90.0	45.0	63.0
Operating (hr/day)	24	24	24
Operating (day/month)	30	30	30
Consumption (KWH/month)	64,800	32,400	45,360
Electricity (NT\$/month)	194,400	97,200	136,080
Saving (KWH/month)	-	32,400	19,440
Saving (NT\$/month)	-	97,200	58,320
Implement cost (NT\$)	-		
Return of I.C. (month)	-		

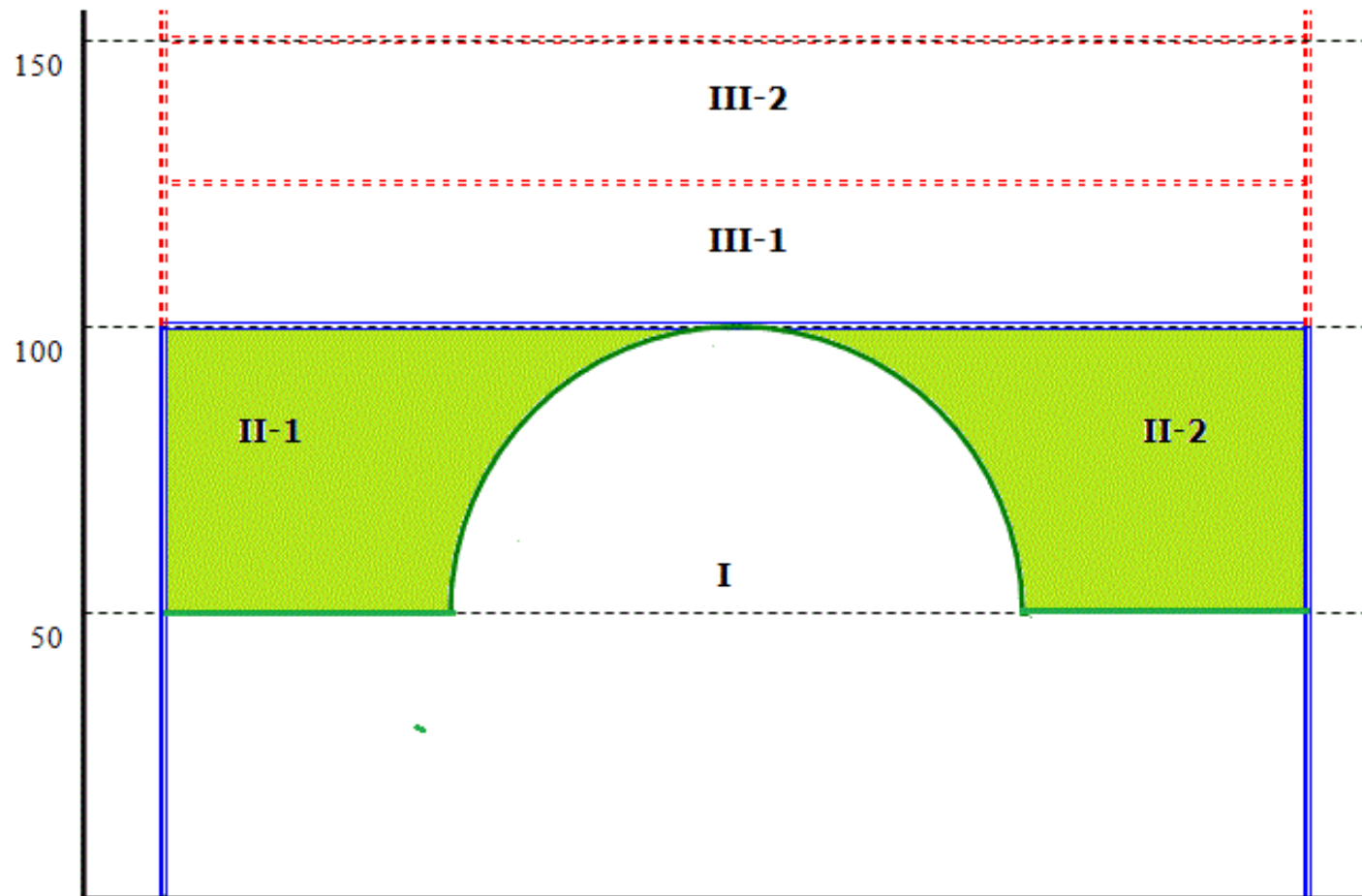
NT\$3.0 /KWH

# ◆ Energy saving system

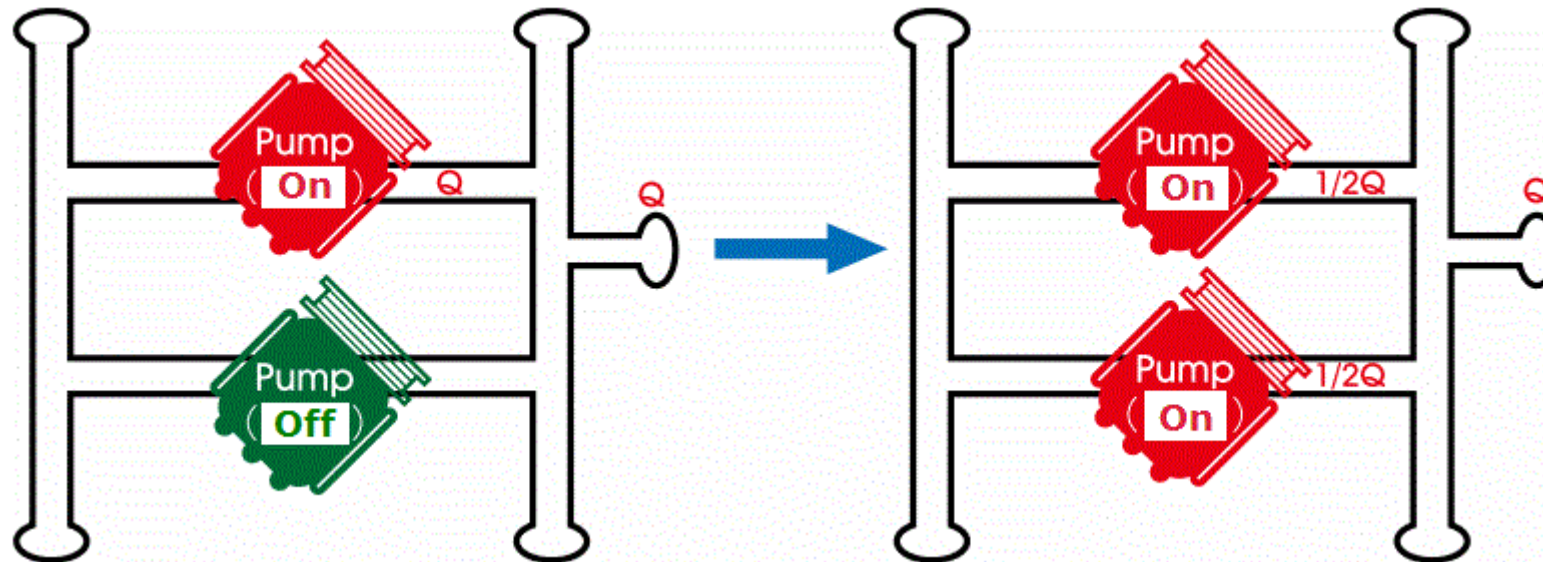




# ◆ Theorem (I)



## ◆ Theorem (II)



### Summer

- Original design: 3 pumps, 2 ON, 1 OFF.
- New design : 3 pumps ON, running at  $2/3$  speed · saving **55%** energy.

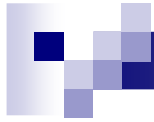
### Winter

- Original design : 3 pumps, 1 ON, 2 OFF.
- New design : 1 pump OFF, 2 pumps ON, running at  $1/2$  speed, saving **75%** energy.

## ◆ Benefits

Place	Air condition room					
Equipment	40HP ice water pump*3 + 40HP cooling water pump*3					
Op. mode	Fixed Hz ( <b>without</b> ES sys.)			Flexible Hz ( <b>with</b> ES sys.)		
Op. period	10/2 ~ 10/23			10/23 ~ 10/31		
Op. hours	494			192		
KWH meter	Start	End	Accum.	Start	End	Accum.
KWH	0	48,032	48,032	0	9,045	9,045
Standard	KWH/hr	97.23		KWH/hr	47.11	
Saving(%)	$(97.23 - 47.11) / 97.23 = 51.55\%$					
Saving (KWH/month)	$(97.23 \times 24 \times 30) \times 55.15\% = 36,088$					
Saving (NT\$/month)	$36,088 \times 3.0 = \text{NT\$}108,264$					
Saving (NT\$/year)	$108,264 \times 12 = \text{NT\$}1,299,168$					
Acceptance	Qualified					





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**Saving your money and our Earth !**