

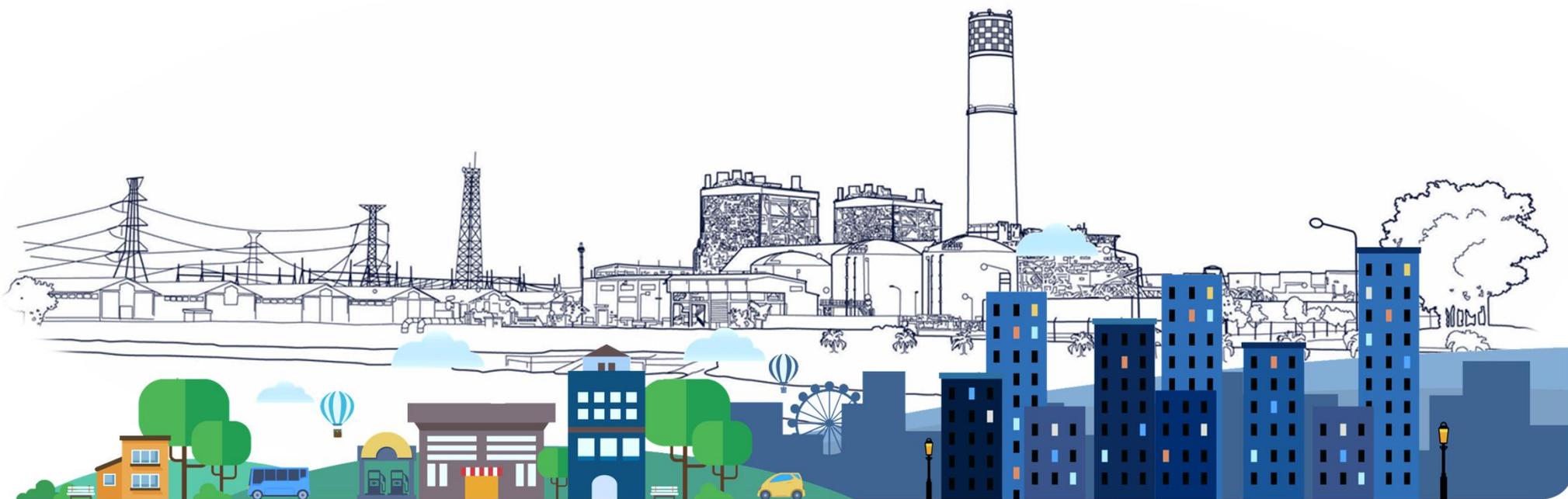
**RATCH**



RATCHABURI  
ELECTRICITY GENERATING  
HOLDING PCL.

# Analyst Meeting 3Q2018

26 November 2018



# Agenda

- Highlights
- RATCH Overview
- Operating Performance
- Financial Performance
- Appendix

# Highlights

# Highlights: Black Start of Kemerton Power Station

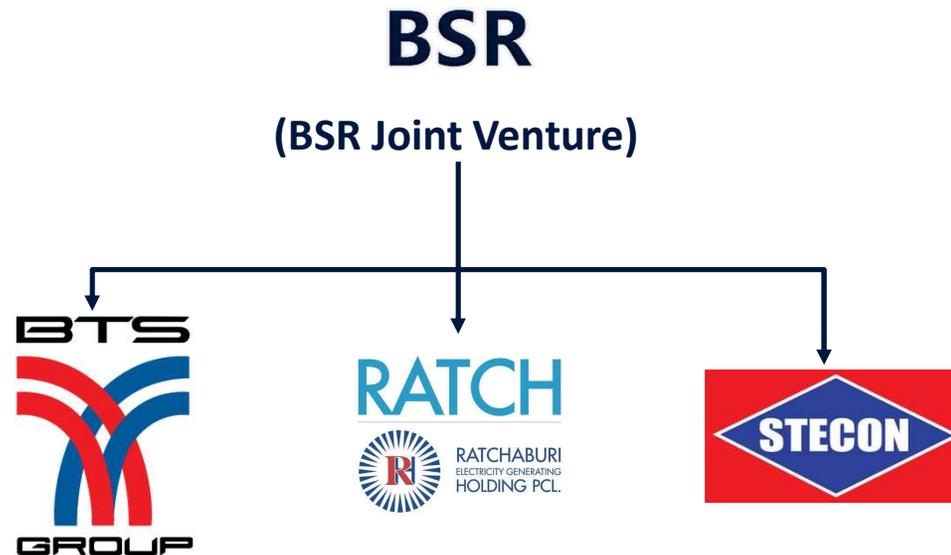
On 23<sup>rd</sup> October 2018, the Diesel Generator Installation Project of the System Restart Service (Black Start) of Kemerton Power Station had started its commercial operation consistent with Ancillary Service Deed System Restart Service.

## **Black Start Service**

- 4 sets of diesel generators
- Total installed capacity 7 MW
- Provide System Restart Service (Black Start) within the Southwest In-connected System ("SWIS")

# Highlights: The Participation in the Bidding of the High-Speed Rail Project

On 12<sup>th</sup> November 2018, The Company, BTS Group Holdings Plc and Sino-Thai Engineering & Construction Plc had jointly submitted the proposal under the name of “BSR Joint Venture” for the bidding of the High-Speed Rail Project linking 3 major airports - Don Muang International Airport, Suvarnabhumi International Airport and U-Tapao International Airport, to the State Railway of Thailand. The project is under the public-private partnership (PPP) framework.



# Highlights: Fire incident at Windy Hill Wind Farm

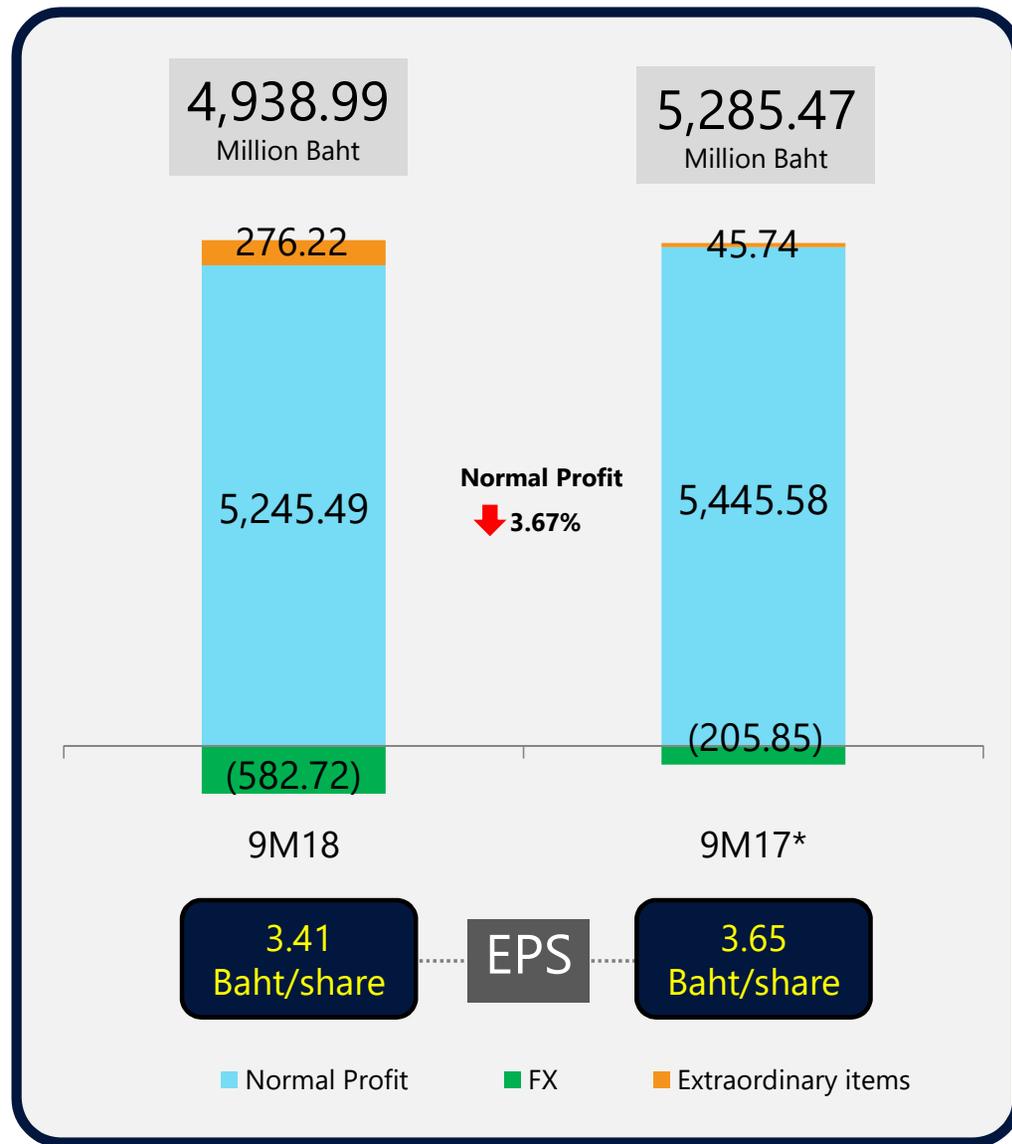
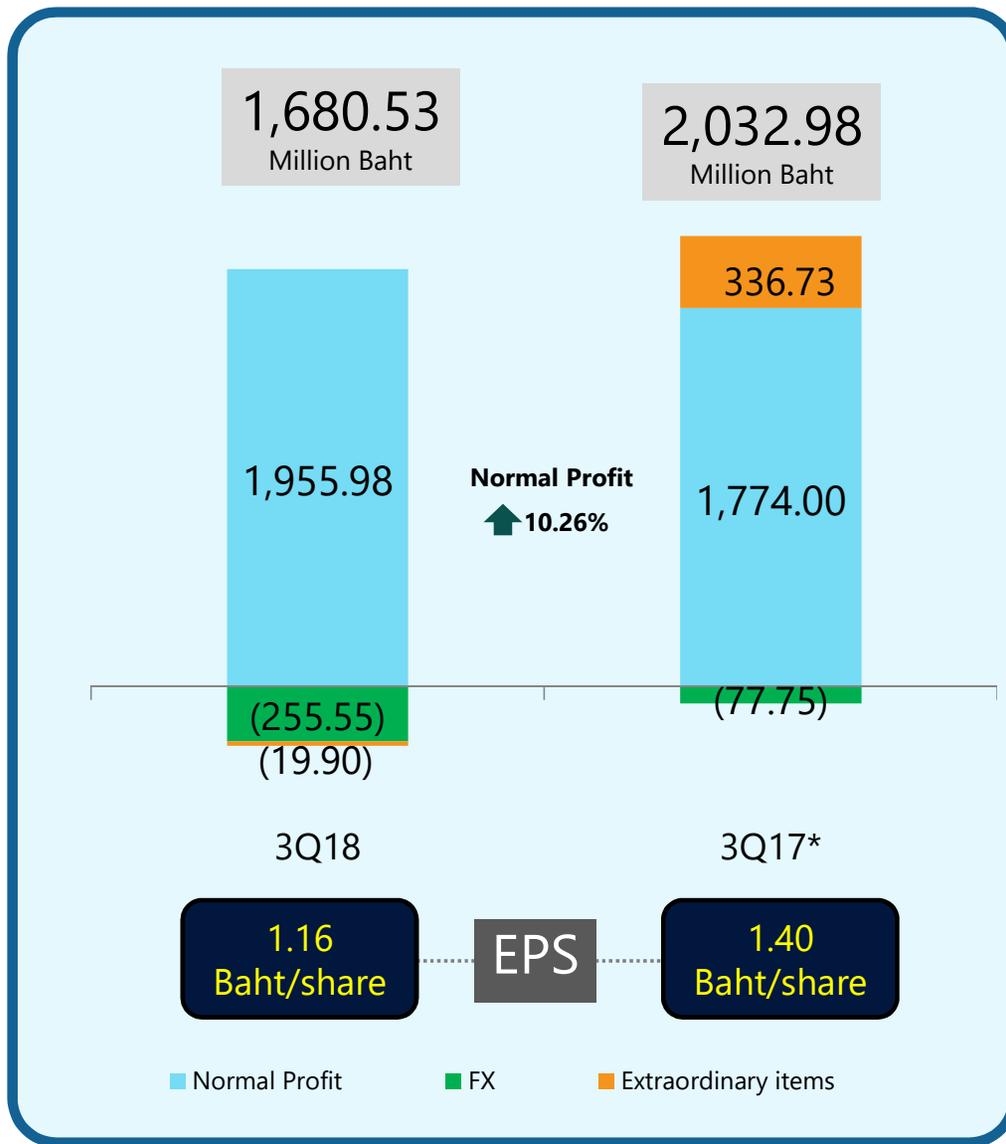
On 13<sup>th</sup> November 2018, A wind turbine generator#1 at Windy Hill Wind Farm, Queensland, Australia had caught a fire around 3.00 p.m. local time and the fire had stopped at approximately 5.00 p.m. local time on the same day. At the time, the Wind Farm had temporarily been shut down for assessing the damage and investigating the cause of the fire.

On 15<sup>th</sup> November 2018, the turbine has been isolated and the remaining 19 turbines had returned to normal operation at 9.30 a.m. local time

## Windy Hill

- 20 x 600kW
- Total installed capacity 12 MW

# Profit for the period: Equity holders of the Company



# RATCH Overview

# Overview of RATCH projects

## Capacity until 2021 (Committed Projects)

Projects in operation		
	MW.	%
Gas	5,464.15	82.48%
Coal	751.20	11.34%
Hydro	268.11	4.05%
Wind	107.40	1.62%
Solar	29.98	0.45%
Biomass	3.96	0.06%
<b>6,624.80 MW.</b>		

## Projects in pipeline from 2018 to 2021

	Nuclear	MRT	Gas	Wind	Hydro	Solar	
MW.	236.00	191.00	199.76	180.45	102.50	42.50	<b>952.21 MW</b>

**MRT Pink Line Project and MRT Yellow Line Project**  
equivalent to 191 MW.  
**Guangxi Fangchenggang Nuclear Power (II)**  
236 MW.  
**Riau Combined-Cycle Power Plant**  
141.03 MW.

**Xe Pian – Xe Namnoy**  
102.50 MW.  
**Berkprai Cogeneration**  
34.73 MW.

**137.23 MW.**

**568.03 MW.**

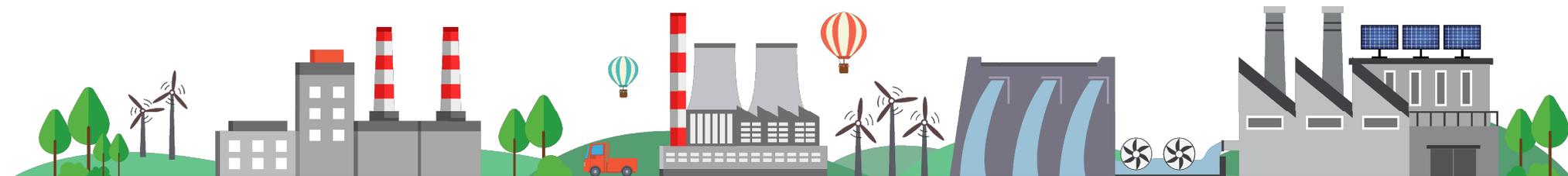
November 2018 — **2018** — **2019** — **2020** — **2021**

**222.95 MW.**

**Collinsville Solar PV**  
42.50 MW.  
**Mount Emerald**  
180.45 MW.

**24 MW.**

**NNEG Expansion Project**  
24 MW.

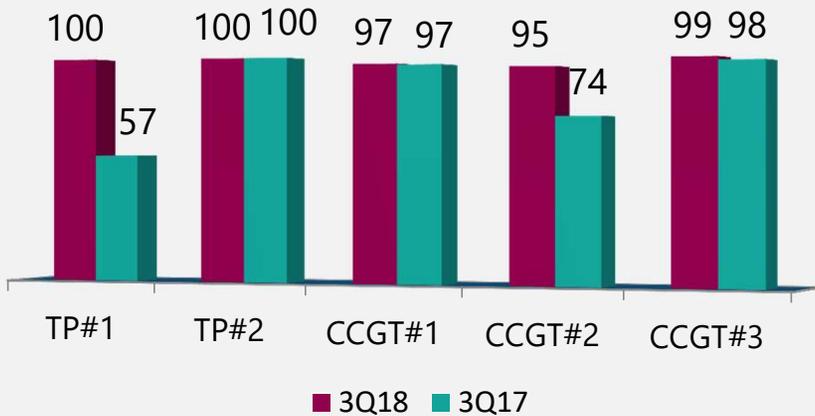


# Operating Performance

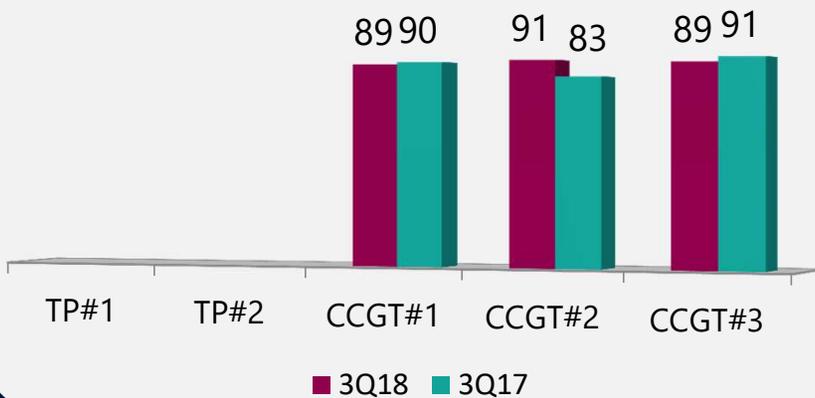
# Operation Performance : RATCHGEN

## 3Q18 & 3Q17

### %Equivalent Availability Factor

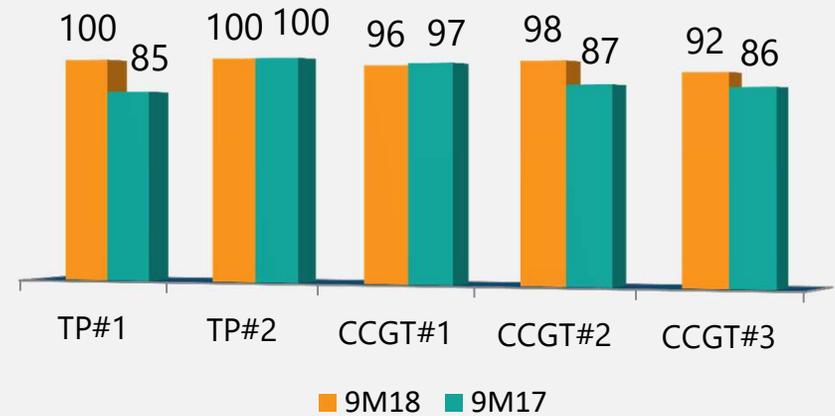


### %Dispatch Factor

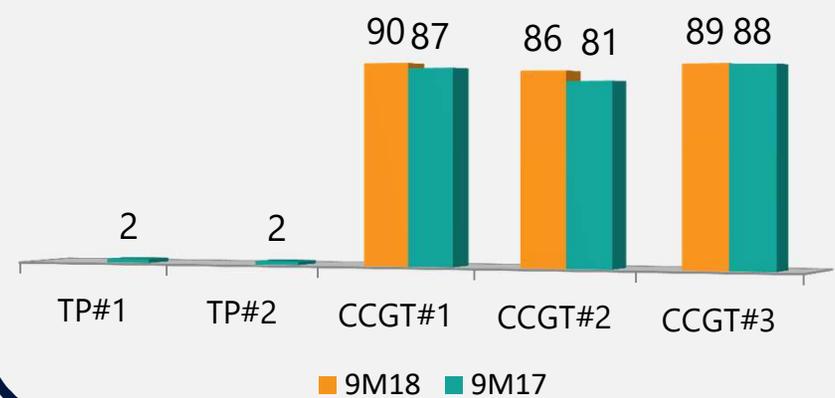


## 9M18 & 9M17

### %Equivalent Availability Factor

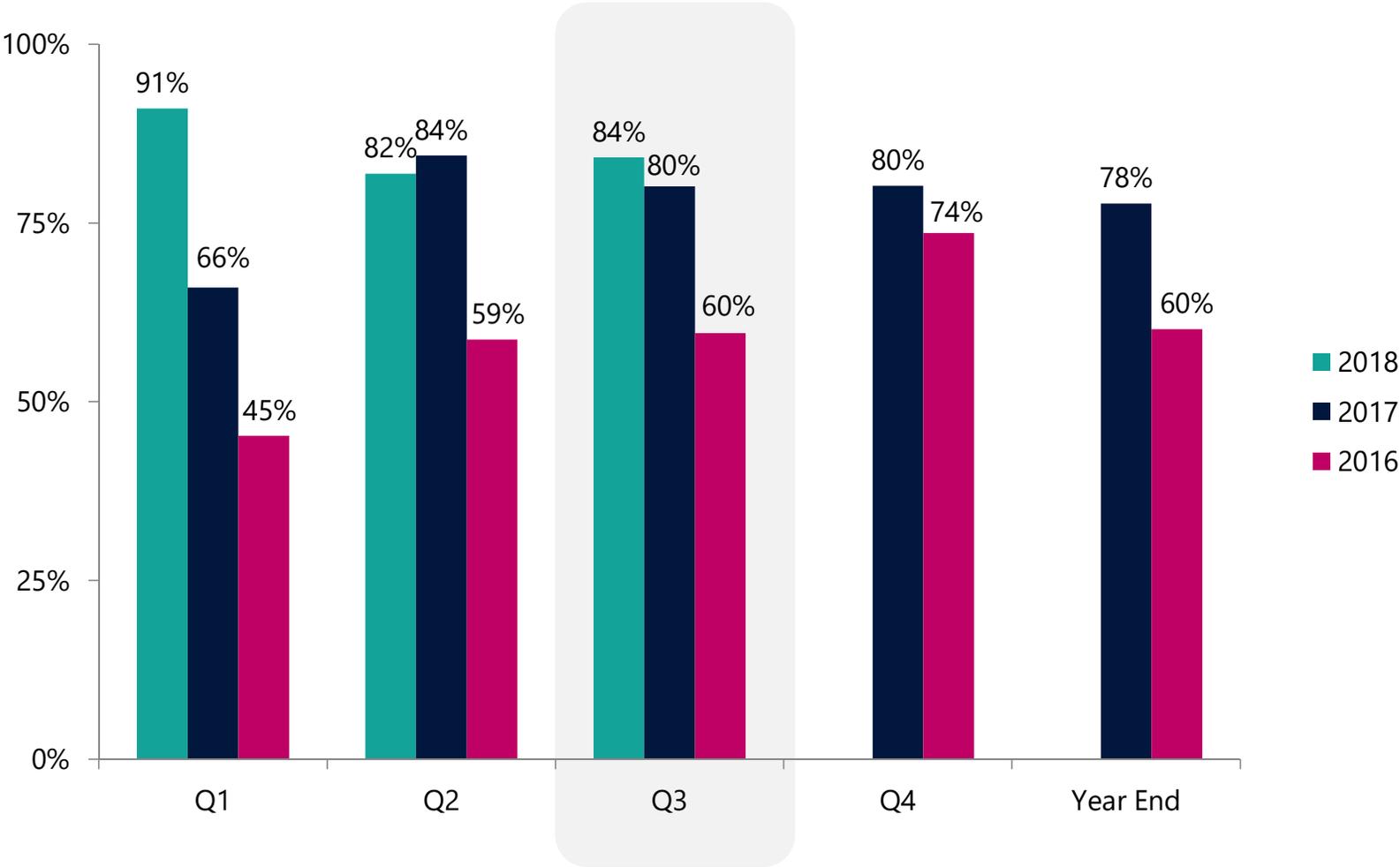


### %Dispatch Factor



# Operation Performance : Hongsa

% Commercial Equivalent Availability Factor ( 3 Units)



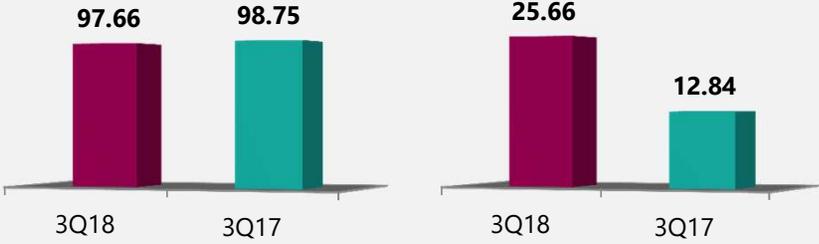
# Operation Performance : Huay bong

## Huay bong 2 (KR2)

### 3Q18 & 3Q17

Avg. Commercial Availability (%)

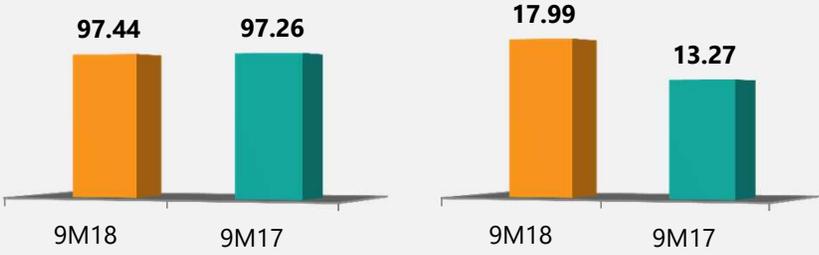
Capacity Factor (%)



### 9M18 & 9M17

Avg. Commercial Availability (%)

Capacity Factor (%)

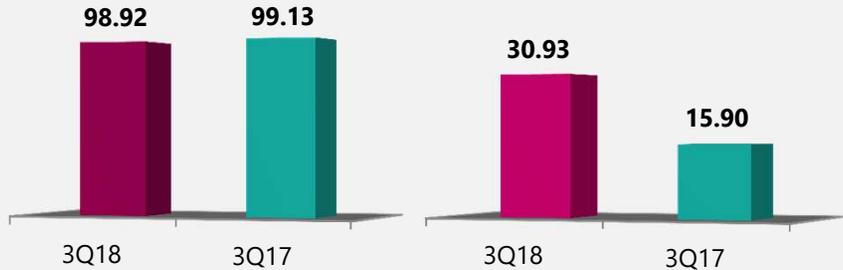


## Huay bong 3 (FKW)

### 3Q18 & 3Q17

Avg. Commercial Availability (%)

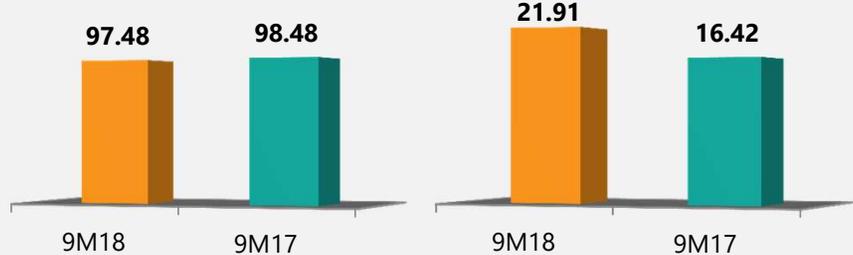
Capacity Factor (%)



### 9M18 & 9M17

Avg. Commercial Availability (%)

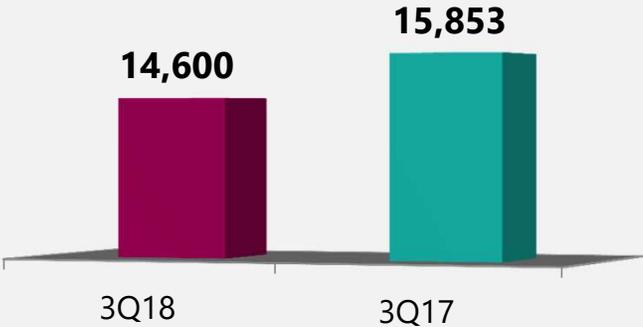
Capacity Factor (%)



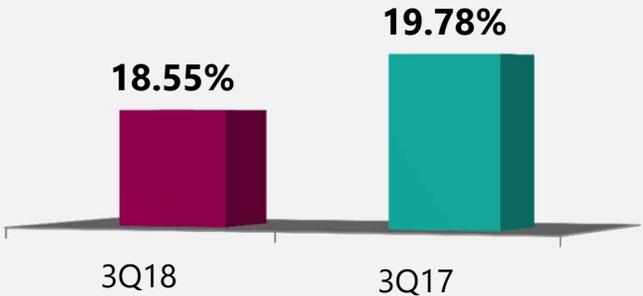
# Operation Performance : Solarta

## 3Q18 & 3Q17

Total Net Energy (MWh /Quarter)

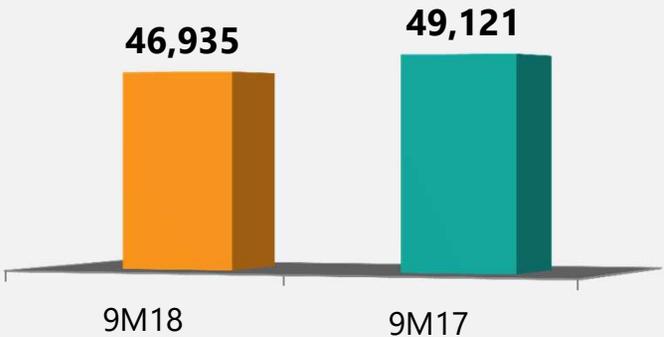


% Avg. Capacity Factor



## 9M18 & 9M17

Total Net Energy (MWh /Quarter)

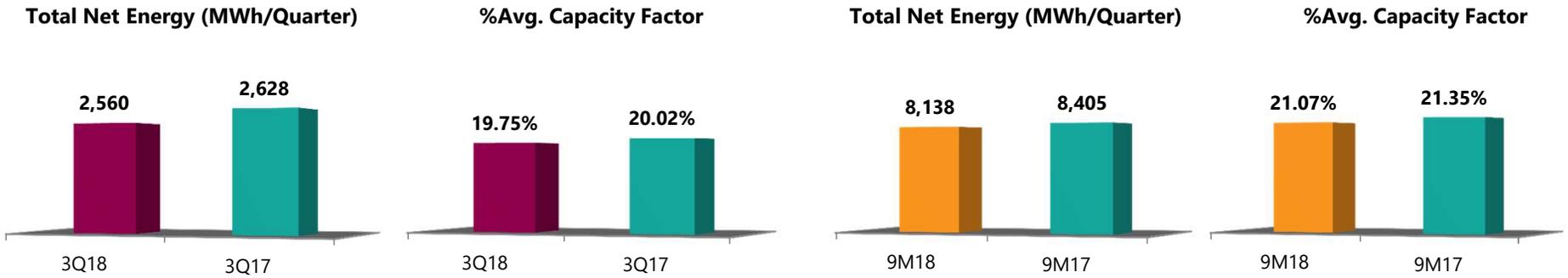


% Avg. Capacity Factor

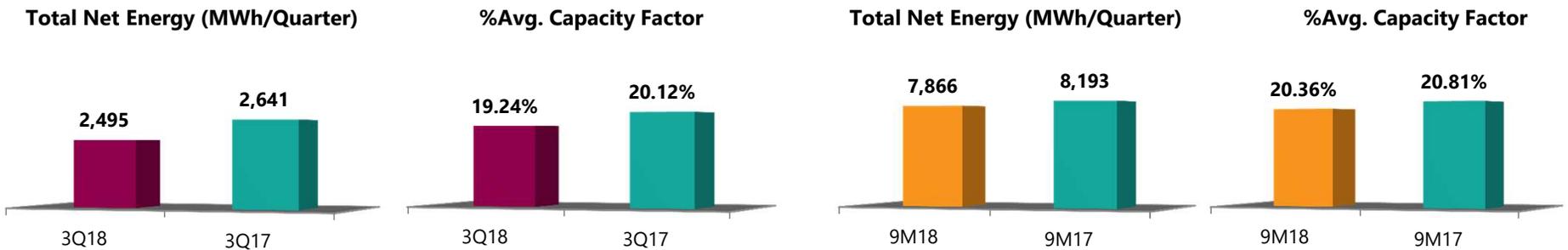


# Operation Performance : Solar Power

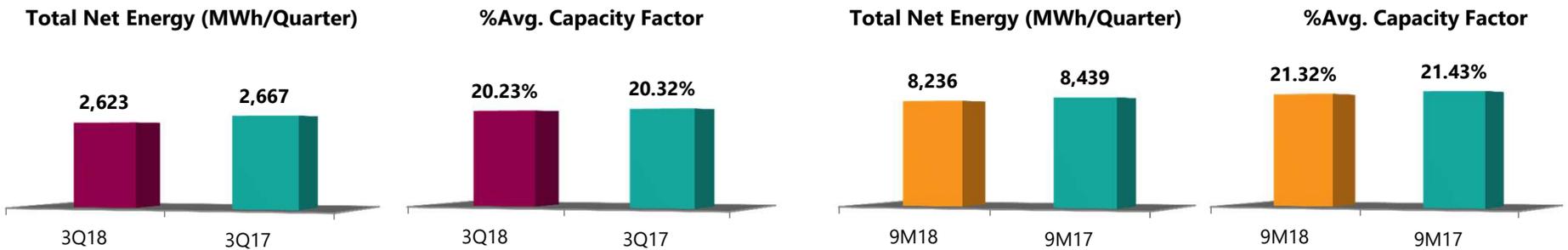
Korat 3



Korat 4



Korat 7



# Financial Performance

# Income Statement : 3Q18 & 3Q17 (Applied Hedge Accounting)

Unit : in Million Baht	3Q18	2Q18	1Q18	3Q17*	2Q17*	1Q17*
Revenues	11,695.24	10,982.05	9,091.07	11,303.72	11,150.26	9,978.02
Cost & Expenses	(10,168.69)	(9,528.54)	(7,827.81)	(9,800.90)	(9,412.26)	(8,477.49)
<b>EBITDA before Share of Profit and FX</b>	<b>1,526.55</b>	<b>1,453.51</b>	<b>1,263.26</b>	<b>1,502.82</b>	<b>1,738.00</b>	<b>1,500.53</b>
Share of profit of jointly-controlled entities and associates <b>excluding</b> gain (loss) on exchange rate	1,307.92	1,172.54	1,251.73	1,268.01	1,378.63	901.32
<b>EBITDA included share profit of JV before FX</b>	<b>2,834.47</b>	<b>2,626.05</b>	<b>2,514.99</b>	<b>2,770.83</b>	<b>3,116.63</b>	<b>2,401.85</b>
Gain (Loss) on exchange rate of subsidiaries	(31.66)	(174.79)	(344.10)	200.65	48.02	233.00
Gain (Loss) on exchange rate of JV	(223.89)	554.62	(362.90)	(278.40)	(33.17)	(375.95)
<b>EBITDA included share profit of JV and FX</b>	<b>2,578.92</b>	<b>3,005.88</b>	<b>1,807.99</b>	<b>2,693.08</b>	<b>3,131.48</b>	<b>2,258.90</b>
<i>Insurance claim</i>	-	-	-	53.77	-	85.61
<i>Diesel price movement (RG &amp; RPCL)</i>	-	-	-	111.05	(53.65)	(16.01)
<i>Depreciation &amp; Amortization - Cost</i>	(284.59)	(284.47)	(292.41)	(305.37)	(322.87)	(319.16)
<i>Depreciation &amp; Amortization – Admin</i>	(19.10)	(19.40)	(19.80)	(32.52)	(33.70)	(35.11)
<b>EBIT</b>	<b>2,275.23</b>	<b>2,702.01</b>	<b>1,495.78</b>	<b>2,520.01</b>	<b>2,721.26</b>	<b>1,974.23</b>
Finance costs	(337.54)	(403.07)	(161.78)	(204.63)	(484.24)	(583.24)
Income tax expense	(257.16)	(164.03)	(229.09)	(263.12)	(234.39)	(247.47)
<b>Profit for the period</b>	<b>1,680.53</b>	<b>2,134.91</b>	<b>1,104.91</b>	<b>2,052.26</b>	<b>2,002.63</b>	<b>1,143.52</b>
(Profit) Loss for non-controlling interests	-	(3.04)	21.67	(19.28)	45.39	60.95
<b>Profit for the Company</b>	<b>1,680.53</b>	<b>2,131.87</b>	<b>1,126.58</b>	<b>2,032.98</b>	<b>2,048.02</b>	<b>1,204.47</b>

# Income Statement : 9M18 & 9M17 (Applied Hedge Accounting)

Unit : in Million Baht	9M18	9M17*
Revenues	31,768.36	32,432.00
Cost & Expenses	(27,525.04)	(27,690.65)
<b>EBITDA before Share of Profit and FX</b>	<b>4,243.32</b>	<b>4,741.35</b>
Share of profit of jointly-controlled entities and associates <u>excluding</u> gain (loss) on exchange rate	3,732.19	3,547.95
<b>EBITDA included share profit of JV before FX</b>	<b>7,975.51</b>	<b>8,289.30</b>
Gain (Loss) on exchange rate of subsidiaries	(550.55)	481.67
Gain (Loss) on exchange rate of JV	(32.17)	(687.52)
<b>EBITDA included share profit of JV and FX</b>	<b>7,392.79</b>	<b>8,083.45</b>
<i>Insurance claim</i>	-	139.38
<i>Diesel price movement (RG &amp; RPCL)</i>	-	41.39
<i>Depreciation &amp; Amortization - Cost</i>	(861.47)	(947.40)
<i>Depreciation &amp; Amortization – Admin</i>	(58.30)	(101.33)
<b>EBIT</b>	<b>6,473.02</b>	<b>7,215.49</b>
Finance costs	(902.39)	(1,272.11)
Income tax expense	(650.28)	(744.97)
<b>Profit for the period</b>	<b>4,920.35</b>	<b>5,198.41</b>
(Profit) Loss for non-controlling interests	18.64	87.06
<b>Profit for the Company</b>	<b>4,938.99</b>	<b>5,285.47</b>

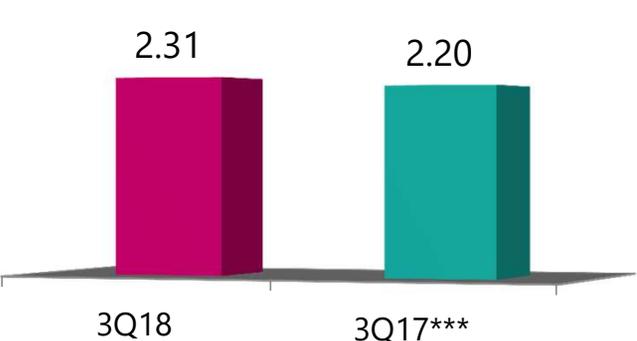
# Statements of Financial Position

As of 30 September 2018

<b>Total Assets</b>	<b>Million Baht</b>	<b>Total Liabilities &amp; Equity</b>	<b>Million Baht</b>
<b><u>Assets</u></b>		<b><u>Liabilities</u></b>	
Cash and cash equivalents	15,396.42	Loans from Related party, Financial Institutions & Debentures	32,739.49
Current investments	542.92	Derivative liabilities	392.07
Current Assets	11,367.43	Other liabilities	10,101.95
Investment in Jointly-controlled entities/Associates/Others	28,849.48	<b>Total Liabilities</b>	<b>43,233.51</b>
Derivative assets	194.15	<b><u>Equity</u></b>	
Financial lease receivables	18,627.35	Issued and paid-up share capital	16,031.78
Property, plant & equipments	20,306.29	Retained earnings	49,304.16
Other assets	7,726.99	Other components of equity	(5,558.42)
		<b>Total equity attributable to owners of the Company</b>	<b>59,777.52</b>
<b>Total Assets</b>	<b>103,011.03</b>	<b>Total Liabilities &amp; Equity</b>	<b>103,011.03</b>

# Financial Ratios\*

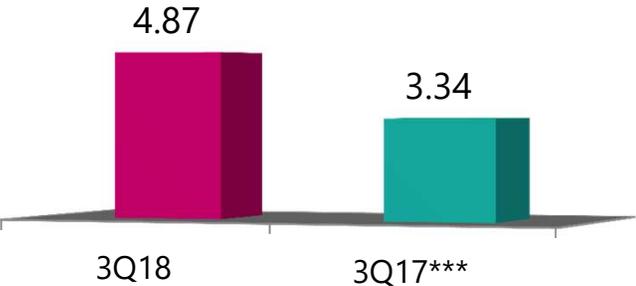
**Current Ratio (times)**



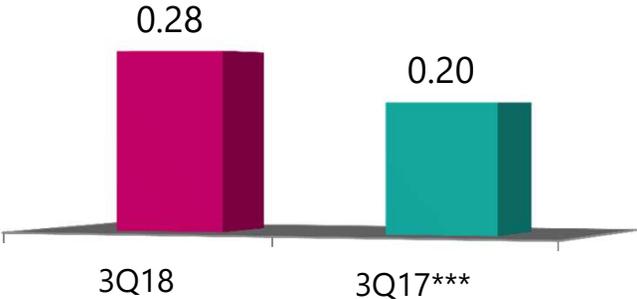
**ROE (%)**



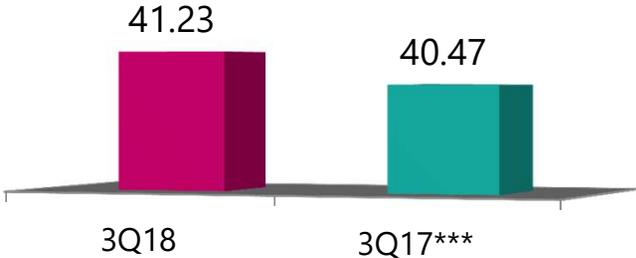
**Net Debt to EBITDA\*\*(times)**



**Net Debt to Equity (times)**



**Book Value per share (Baht)**



\* Not included the effect of foreign exchange rate  
 \*\* Included the change in lease receivable  
 \*\*\* Restated

## Appendix: Operating Performance

# RATCHGEN Operating Performance

<b>Fuel Consumption</b>		<b>3Q18</b>	<b>3Q17</b>	<b>9M18</b>	<b>9M17</b>
<b>By Type of Power Plant</b>					
<b>Fuel Consumption (TH#1-2)</b>					
- Gas	Million MMBTU	-	-	-	0.45
- Heavy Oil	Million Liters	-	-	-	26.70
<b>Fuel Consumption (CCGT#1-3)</b>					
- Gas	Million MMBTU	27.67	25.19	78.26	72.25
- Diesel	Million Liters	0.09	0.10	0.32	0.38
<b>Gas Price (Average) Baht/MMBTU</b>		<b>265.12</b>	<b>241.04</b>	<b>252.82</b>	<b>239.53</b>
<b>Heavy Oil Price (Average) Baht/Liter</b>		-	-	-	<b>9.46</b>
<b>Diesel Oil Price (Average) Baht/Liter</b>		<b>23.89</b>	<b>23.89</b>	<b>23.89</b>	<b>24.07</b>

# RATCHGEN Operating Performance

<b>Net Generation (GWh)</b>				
<b>By Type of Power Plant</b>	<b>3Q18</b>	<b>3Q17</b>	<b>9M18</b>	<b>9M17</b>
<b>Net Generation (TP#1-2) (GWh)</b>	-	-	-	<b>140.75</b>
- By Gas (GWh)	-	-	-	41.42
- By Heavy Oil (GWh)	-	-	-	99.33
<b>Net Generation (CCGT#1-3) (GWh)</b>	<b>3,904.11</b>	<b>3,551.18</b>	<b>11,018.83</b>	<b>10,184.89</b>
- By Gas (GWh)	3,904.11	3,551.18	11,018.83	10,184.89
- By Diesel (GWh)	-	-	-	-
<b>Total Net Generation (GWh)</b>	<b>3,904.11</b>	<b>3,551.18</b>	<b>11,018.83</b>	<b>10,325.64</b>

**Actual Outage**

**Planned Outage at Ratchaburi Power Plant in 2017**

Plant		Jan	Feb	Mar	Apr	May	Jun	July	Aug	Sep	Oct	Nov	Dec
RG	CCST-10											12	MI(26D) 7
	CCGT-11											23	CI (15D) 7
	CCGT-12											23	CI (15D) 7
RG	CCST-20								3	MI (30D) 2			
	CCGT-21								14	CI (19D) 2			
	CCGT-22								14	CI (19D) 2			
RG	CCST-30		1	MI (26d) 26									
	CCGT-31		28	MI (30d) 26									
	CCGT-32		28	MI (30d) 26									
RG	Thermal-1							6	MI (40D) 14				
RG	Thermal-1											19	MI (40D) 28
RG (TE)	CCST-10 - CCTE												
	CCGT-11 - CCTE							6	CI (9D) 14				
	CCGT-12 - CCTE				8	CI (11D) 18							
RPCL	CCST-10												
	CCGT-11											15	MI (34 D) 17
	CCGT-12											15	MI (34 D) 17
RPCL	CCST-20	3	CI (13D) 15										
	CCGT-21	3	CI (13D) 15										
	CCGT-22	3	CI (13D) 15										

Thermal Plant	Minor Inspection (MI)		40 Days	Major Overhaul (MO)		57 Days	
Gas Turbine	Warranty Inspection (WI)			Combustion Inspection		Minor Inspection	Major Overhaul
	Normal (WI)	Gen.Rotor Removed (WI*)		(CI)		(MI)	(MO)
	26 Days	32 Days		15 Days		30 Days	52 Days
Steam Turbine	Warranty Inspection (WI)			Minor Inspection		Major Overhaul	
	Normal (WI**)	Gen.Rotor Removed (WI*)		(MI)		(MO)	
	26 Days	30 Days		26 Days		49 Days	

 Actual Outage  
 Planned Outage

# Planned Outage at Ratchaburi Power Plant in 2018

Plant		Jan	Feb	Mar	Apr	May	Jun	July	Aug	Sep	Oct	Nov	Dec
RG	CCST-10												
	CCGT-11											4	MO (52D) 25
	CCGT-12											4	MO (52D) 25
RG	CCST-20												
	CCGT-21									30	CI (15D) 8		
	CCGT-22									30	CI (15D) 8		
RG	CCST-30												
	CCGT-31		11	CI (15D)	11								
	CCGT-32		11	CI (19D)	1	25							
RG	Thermal-1												
RG	Thermal-2												
RG	CCST-10 - CCTE												
	CCGT-11 - CCTE												CI (20 D) 24
	CCGT-12 - CCTE									22	CI (14 D) 5		
RPCL	CCST-10												
	CCGT-11											21	CI (14D) 3
	CCGT-12											21	CI (14D) 3
RPCL	CCST-20	14	MI (35 D)	15									
	CCGT-21	14	MI (35 D)	15									
	CCGT-22	14	MI (35 D)	15									
Thermal Plant		Minor Inspection (MI)			40 Days	Major Overhaul (MO)			57 Days				
Gas Turbine		Warranty Inspection (WI)				Combustion Inspection			Minor Inspection		Major Overhaul		
		Normal (WI)		Gen.Rotor Removed (WI*)		(CI)			(MI)		(MO)		
		26 Days		32 Days		15 Days			30 Days		52 Days		
Steam Turbine		Warranty Inspection (WI)				Minor Inspection			Major Overhaul				
		Normal (WI**)		Gen.Rotor Removed (WI*)		(MI)			(MO)				
		26 Days		30 Days		26 Days			49 Days				

**Planned Outage**

**Planned Outage at Ratchaburi Power Plant in 2019**

Plant		Jan	Feb	Mar	Apr	May	Jun	July	Aug	Sep	Oct	Nov	Dec
RG	CCST-10											24	MI (26D) 19
	CCGT-11												CI (15D) 19
	CCGT-12												CI (15D) 19
RG	CCST-20								1	MI (26D) 26			
	CCGT-21							6	MO (52D) 26				
	CCGT-22							6	MO (52D) 26				
RG	CCST-30	2	MI (26D) 27										
	CCGT-31	13	CI (15D) 27										
	CCGT-32	13	CI (15D) 27										
RG	Thermal-1								1	MO (57D) 27			
RG	Thermal-2										3	MO (57D) 29	
RG	CCST-10 - CCTE												
	CCGT-11 - CCTE										19	CI (9D) 28	
	CCGT-12 - CCTE										9	CI (9D) 18	
RPCL	CCST-10												
	CCGT-11										20	MO (33D) 21	
	CCGT-12										20	MO (33D) 21	
RPCL	CCST-20												
	CCGT-21	3	CI (10D) 12										
	CCGT-22	3	CI (10D) 12										

Thermal Plant	Minor Inspection (MI)		40 Days	Major Overhaul (MO)		57 Days	
Gas Turbine	Warranty Inspection (WI)			Combustion Inspection		Minor Inspection	Major Overhaul
	Normal (WI)	Gen.Rotor Removed (WI*)		(CI)		(MI)	(MO)
	26 Days	32 Days		15 Days		30 Days	52 Days
Steam Turbine	Warranty Inspection (WI)			Minor Inspection		Major Overhaul	
	Normal (WI**)	Gen.Rotor Removed (WI*)		(MI)		(MO)	
	26 Days	30 Days		26 Days		49 Days	

## Appendix: Financial Performance

# Revenues: 3Q18 & 3Q17

Unit : in Million Baht		3Q18	3Q17*	Diff	%
<b>Sales</b>		<b>10,665.67</b>	<b>10,095.88</b>	<b>569.79</b>	<b>5.64</b>
AP	- RG/TECO	965.09	990.98	(25.89)	(2.61)
	- RAC	396.74	427.37	(30.63)	(7.17)
EP (Fuel)	- RG/TECO	9,045.04	8,434.43	610.61	7.24
	- RAC	258.80	243.10	15.70	6.46
<b>Revenue from financial leases - RG/TECO</b>		<b>814.45</b>	<b>975.56</b>	<b>(161.11)</b>	<b>(16.51)</b>
<b>Revenue from Rendering of services</b>		<b>13.06</b>	<b>12.43</b>	<b>0.63</b>	<b>5.07</b>
<b>Management service income</b>		<b>59.79</b>	<b>61.03</b>	<b>(1.24)</b>	<b>(2.03)</b>
<b>Dividend Income</b>		<b>71.20</b>	<b>74.75</b>	<b>(3.55)</b>	<b>(4.75)</b>
<b>Interest Income</b>		<b>63.12</b>	<b>38.27</b>	<b>24.85</b>	<b>64.93</b>
<b>Other Incomes (exc. Extraordinary items)</b>		<b>7.95</b>	<b>45.80</b>	<b>(37.85)</b>	<b>(82.64)</b>
<b>Total Revenues</b>		<b>11,695.24</b>	<b>11,303.72</b>	<b>391.52</b>	<b>3.46</b>

# Revenues: 9M18 & 9M17

Unit : in Million Baht		9M18	9M17*	Diff	%
Sales		<b>28,619.32</b>	<b>28,734.73</b>	<b>(115.41)</b>	<b>(0.40)</b>
AP	- RG/TECO	2,887.67	3,082.51	(194.84)	(6.32)
	- RAC	1,152.59	1,245.30	(92.71)	(7.44)
EP (Fuel)	- RG/TECO	24,024.69	23,848.59	176.10	0.74
	- RAC	554.37	558.33	(3.96)	(0.71)
Revenue from financial leases - RG/TECO		<b>2,553.30</b>	<b>3,053.43</b>	<b>(500.13)</b>	<b>(16.38)</b>
Revenue from Rendering of services		<b>38.16</b>	<b>38.00</b>	<b>0.16</b>	<b>0.42</b>
Management service income		<b>178.49</b>	<b>184.77</b>	<b>(6.28)</b>	<b>(3.40)</b>
Dividend Income		<b>187.18</b>	<b>188.90</b>	<b>(1.72)</b>	<b>(0.91)</b>
Interest Income		<b>146.99</b>	<b>130.24</b>	<b>16.75</b>	<b>12.86</b>
Other Incomes (exc. Extraordinary items)		<b>44.92</b>	<b>101.93</b>	<b>(57.01)</b>	<b>(55.93)</b>
<b>Total Revenues</b>		<b>31,768.36</b>	<b>32,432.00</b>	<b>(663.64)</b>	<b>(2.05)</b>

# Share of profit from jointly-controlled entities : 3Q18 & 3Q17

(Applied Hedge Accounting)

Unit : in Million Baht	3Q18	3Q17*	Diff	%
RPCL	81.89	96.29	(14.40)	(14.95)
SEAN	248.78	124.56	124.22	99.73
HPC	581.74	555.44	26.30	4.73
PHU FAI	41.71	37.95	3.76	9.91
CRESCO	3.70	0.70	3.00	428.57
SOLARTA	43.51	47.64	(4.13)	(8.67)
KORAT 3,4,7	19.68	16.72	2.96	17.70
FKW	12.74	18.00	(5.26)	(29.22)
KR2	10.41	11.00	(0.59)	(5.36)
KWINANA	13.14	18.25	(5.11)	(28.00)
PNPC	(62.54)	(24.99)	(37.55)	150.26
RW COGEN	64.75	65.95	(1.20)	(1.82)
NNEG	17.16	25.62	(8.46)	(33.02)
Songkhla Biomass	8.93	10.34	(1.41)	(13.64)
Others	(1.57)	(13.86)	12.29	(88.67)
<b>Total Share of profit from jointly-controlled entities</b>	<b>1,084.03</b>	<b>989.61</b>	<b>94.42</b>	<b>9.54</b>

# Share of profit from jointly-controlled entities : 3Q18 & 3Q17

**EXCL.FX (Applied Hedge Accounting)**

Unit : in Million Baht	3Q18	3Q17*	Diff	%
RPCL	73.08	81.63	(8.55)	(10.47)
SEAN	249.07	102.01	147.06	144.16
HPC	759.07	839.45	(80.38)	(9.58)
PHU FAI	37.29	37.56	(0.27)	(0.72)
CRESCO	2.45	(0.62)	3.07	(495.16)
SOLARTA	43.50	47.64	(4.14)	(8.69)
KORAT 3,4,7	19.68	16.72	2.96	17.70
FKW	12.74	17.98	(5.24)	(29.14)
KR2	10.41	11.00	(0.59)	(5.36)
KWINANA	13.14	18.25	(5.11)	(28.00)
PNPC	(6.14)	6.08	(12.22)	(200.99)
RW COGEN	64.67	65.92	(1.25)	(1.90)
NNEG	17.60	25.62	(8.02)	(31.30)
Songkhla Biomass	8.93	10.34	(1.41)	(13.64)
Others	2.43	(11.57)	14.00	(121.00)
<b>Total Share of profit from jointly-controlled entities</b>	<b>1,307.92</b>	<b>1,268.01</b>	<b>39.91</b>	<b>3.15</b>

# Share of profit from jointly-controlled entities : 9M18 & 9M17

(Applied Hedge Accounting)

Unit : in Million Baht	9M18	9M17*	Diff	%
RPCL	215.91	315.30	(99.39)	(31.52)
SEAN	317.64	199.87	117.77	58.92
HPC	2,485.53	1,700.43	785.10	46.17
PHU FAI	111.93	114.50	(2.57)	(2.24)
CRESCO	8.28	16.30	(8.02)	(49.20)
SOLARTA	142.46	149.95	(7.49)	(4.99)
KORAT 3,4,7	65.95	59.56	6.39	10.73
FKW	(20.86)	58.60	(79.46)	(135.60)
KR2	(0.72)	41.38	(42.10)	(101.74)
KWINANA	34.55	46.88	(12.33)	(26.30)
PNPC	5.79	(104.20)	109.99	(105.56)
RW COGEN	199.36	189.02	10.34	5.47
NNEG	126.24	75.70	50.54	66.76
Songkhla Biomass	27.30	18.09	9.21	50.91
Others	(19.34)	(20.94)	1.60	(7.64)
<b>Total Share of profit from jointly-controlled entities</b>	<b>3,700.02</b>	<b>2,860.44</b>	<b>839.58</b>	<b>29.35</b>

# Share of profit from jointly-controlled entities : 9M18 & 9M17

**EXCL.FX (Applied Hedge Accounting)**

Unit : in Million Baht	9M18	9M17*	Diff	%
RPCL	207.22	262.18	(54.96)	(20.96)
SEAN	268.07	114.52	153.55	134.08
HPC	2,529.46	2,433.01	96.45	3.96
PHU FAI	112.34	108.17	4.17	3.86
CRESCO	4.15	12.50	(8.35)	(66.80)
SOLARTA	142.45	149.95	(7.50)	(5.00)
KORAT 3,4,7	65.95	59.56	6.39	10.73
FKW	(20.87)	58.58	(79.45)	(135.63)
KR2	(0.72)	41.38	(42.10)	(101.74)
KWINANA	34.55	46.88	(12.33)	(26.30)
PNPC	49.07	(3.31)	52.38	(1,582.48)
RW COGEN	199.35	188.87	10.48	5.55
NNEG	127.14	75.70	51.44	67.95
Songkhla Biomass	27.30	18.09	9.21	50.91
Others	(13.27)	(18.12)	4.85	(26.77)
<b>Total Share of profit from jointly-controlled entities</b>	<b>3,732.19</b>	<b>3,547.96</b>	<b>184.23</b>	<b>5.19</b>

# Cost and Expenses : 3Q18 & 3Q17

Unit : in Million Baht	3Q18	3Q17*	Diff	%
<b>Cost of Sale and rendering of services</b>	<b>9,803.27</b>	<b>9,436.79</b>	<b>366.48</b>	<b>3.88</b>
– Fuel Cost : RG/ TECO	8,958.88	8,336.16	622.72	7.47
– Fuel Cost : RAC	0.82	3.56	(2.74)	(76.97)
– Operation & Maintenance	349.44	405.56	(56.12)	(13.84)
– Repairing Expense (CSA)	261.67	269.52	(7.85)	(2.91)
– Spare parts	43.85	195.86	(152.01)	(77.61)
– Insurance Premium	91.66	112.65	(20.99)	(18.63)
– Standby Charge	47.08	54.25	(7.17)	(13.22)
– Others	49.87	59.23	(9.36)	(15.80)
<b>Selling and Admin- Expenses</b>	<b>365.42</b>	<b>364.11</b>	<b>1.31</b>	<b>0.36</b>
<b>Total Cost and Expenses**</b>	<b>10,168.69</b>	<b>9,800.90</b>	<b>367.79</b>	<b>3.75</b>

\* Restated

\*\* excluding depreciation & amortization

# Cost and Expenses : 9M18 & 9M17

Unit : in Million Baht	9M18	9M17*	Diff	%
<b>Cost of Sale and rendering of services</b>	<b>26,421.07</b>	<b>26,569.92</b>	<b>(148.85)</b>	<b>(0.56)</b>
– Fuel Cost : RG/ TECO	23,795.21	23,499.41	295.80	1.26
– Fuel Cost : RAC	0.82	5.42	(4.60)	(84.87)
– Operation & Maintenance	1,085.26	1,134.36	(49.10)	(4.33)
– Repairing Expense (CSA)	777.96	841.61	(63.65)	(7.56)
– Spare parts	179.24	365.63	(186.39)	(50.98)
– Insurance Premium	279.31	343.47	(64.16)	(18.68)
– Standby Charge	144.53	175.66	(31.13)	(17.72)
– Others	158.74	204.36	(45.62)	(22.32)
<b>Selling and Admin- Expenses</b>	<b>1,103.97</b>	<b>1,120.73</b>	<b>(16.76)</b>	<b>(1.50)</b>
<b>Total Cost and Expenses**</b>	<b>27,525.04</b>	<b>27,690.65</b>	<b>(165.61)</b>	<b>(0.60)</b>

\* Restated

\*\* excluding depreciation & amortization

# Gain (Loss) From Foreign Exchange Rate

Unit : in Million Baht	3Q18	3Q17*	9M18	9M17*
Gain (Loss) from Foreign Exchange Rate	(255.55)	(77.75)	(582.72)	(205.85)
<b>The Company and Subsidiaries</b>	<b>(31.66)</b>	<b>200.65</b>	<b>(550.55)</b>	<b>481.67</b>
- RH	(32.41)	(26.91)	(14.12)	(101.25)
- RH Inter	(34.68)	196.99	(577.08)	460.33
- RG / RE / RL	35.43	30.57	40.65	122.59
<b>Jointly-controlled entities and Associates</b>	<b>(223.89)</b>	<b>(278.40)</b>	<b>(32.17)</b>	<b>(687.52)</b>
- SEAN (33.33%)	(0.29)	22.55	49.57	85.35
- RPCL (25%)	8.81	14.66	8.69	53.12
- HPC (40%)	(177.33)	(284.01)	(43.93)	(732.58)
- PNPC (25%)	(56.40)	(31.07)	(43.28)	(100.89)
- Others (CRESCO, PMPC, RW Cogen, FKW, KR2, NNEG, Solarta, RIC1)	1.32	(0.53)	(3.22)	7.48

Foreign Exchange Rate as at 28 September 2018 = 32.382 Baht/USD

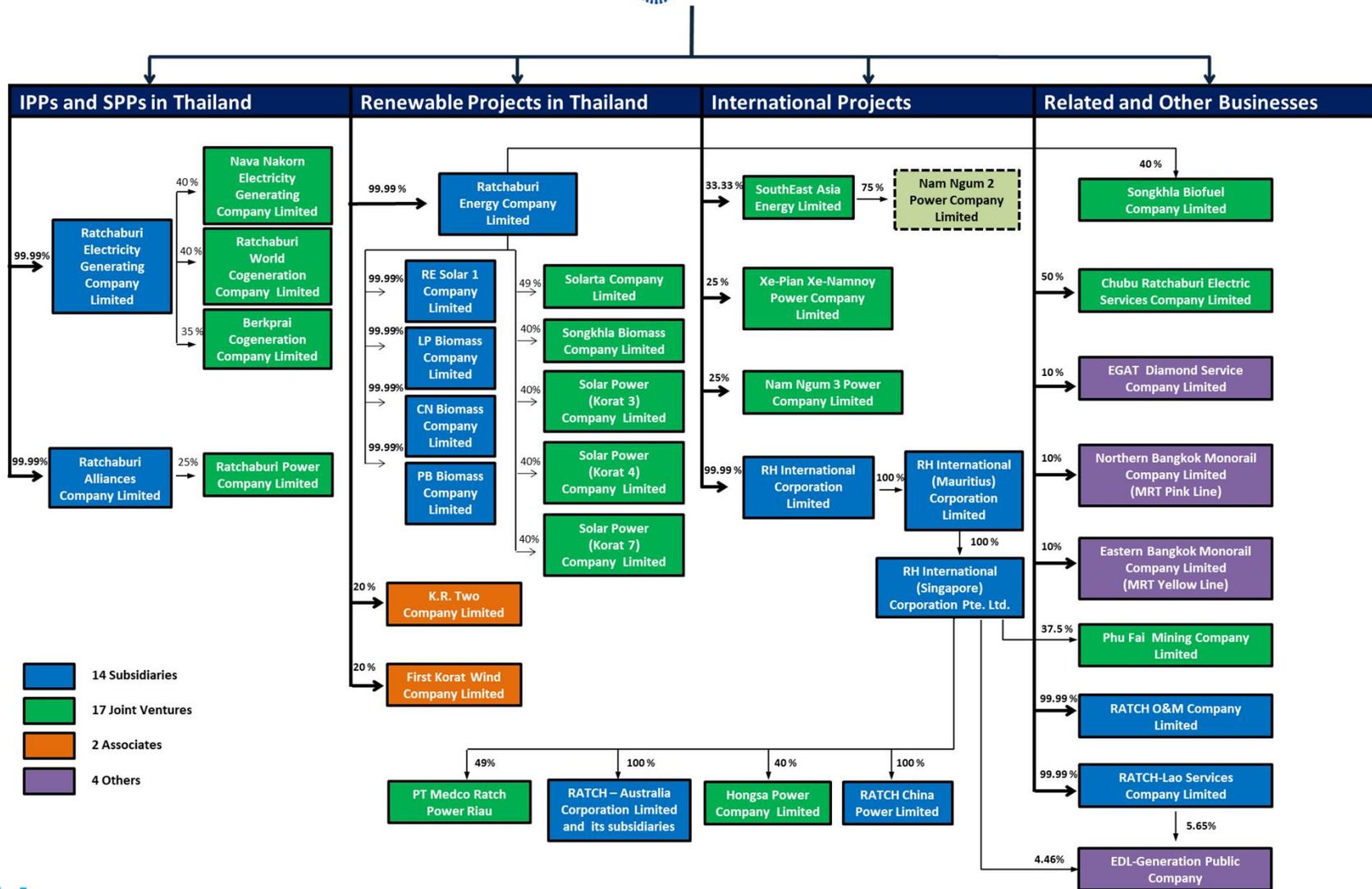
Foreign Exchange Rate as at 29 September 2017 = 33.369 Baht/USD

## Appendix: RATCH Projects

# Company Structure



As of November 2018



# Portfolio by Core Business

## IPPs and SPPs in Thailand

Name of Power Plant/Project	Location	Technology	Total Installed Capacity (MW)	Installed Capacity contributed to the RATCH's Group (MW)	Terms of the PPA		
					PPA Party	Tenure/ Expiry Year	Renewal/ Option to Extend
<b>In Operation</b>							
<b>Ratchaburi Power Plant</b>	Ratchaburi Province	Thermal	1,470	1,470 (100%)	EGAT	25 years/ 2025	N/A
		Combined Cycle	2,175	2,175 (100%)	EGAT	25 years/ 2027	N/A
<b>Tri Energy Power Plant</b>	Ratchaburi Province	Combined Cycle	720	720 (100%)	EGAT	20 years/ 2020	N/A
<b>Ratchaburi Power Power Plant</b>	Ratchaburi Province	Combined Cycle	1,490	372.50 (25%)	EGAT	25 years/ 2033	N/A
<b>Ratchaburi World Cogeneration Project</b>	Ratchaburi Industrial Estate, Ratchaburi Province	Cogeneration	234	93.60 (40%)	EGAT	Block 1: 25 years/ 2039 Block 2: 25 years/ 2040	N/A
<b>Nava Nakorn Electricity Generating Project</b>	Nava Nakorn Industrial Promotion Zone, Pathumthani Province	Cogeneration	139.13	55.65(40%)	EGAT	25 years/ 2041	N/A
<b>Total</b>			<b>6,228.13</b>	<b>4,886.75</b>			

# Portfolio by Core Business

## IPPs and SPPs in Thailand

Name of Power Plant/Project	Location	Technology	Total Installed Capacity (MW)	Installed Capacity contributed to the RATCH's Group (MW)	Terms of the PPA		
					PPA Party	Tenure/ Expiry Year	Renewal/ Option to Extend
<b>Under Construction</b>							
<b>Berkprai Cogeneration</b>	Ratchaburi Province	Cogeneration	99.23	34.73 (35%)	EGAT	25 years/2044 (Expected COD: 2019)	N/A
<b>NNEG Expansion Project</b>	Nava Nakorn Industrial Promotion Zone, Pathumthani Province	Cogeneration	60.00	24.00 (40%)	EGAT	25 years/2045 (Expected COD: 2020)	N/A
<b>Total</b>			<b>159.23</b>	<b>58.73</b>			
<b>Grand Total</b>			<b>6,387.36</b>	<b>4,945.48</b>			

# Portfolio by Core Business

## Renewable Projects in Thailand

Name of Power Plant/Project	Location	Technology	Total Installed Capacity (MW)	Installed Capacity contributed to the RATCH's Group (MW)	Terms of the PPA		
					PPA Party	Tenure/ Expiry Year	Renewal/ Option to Extend
<b>In Operation</b>							
<b>Huay Bong 2 Wind-Turbine Power Plant</b>	Nakorn Ratchasima Province	Wind-Turbine	103.50	20.70 (20%)	EGAT	5 years/ 2023	Automatic renewal for a further 5 years every 5 years
<b>Huay Bong 3 Wind-Turbine Power Plant</b>	Nakorn Ratchasima Province	Wind-Turbine	103.50	20.70 (20%)	EGAT	5 years/ 2022	Automatic renewal for a further 5 years every 5 years
<b>Solar Power Projects (Korat 3, Korat 4, Korat 7)</b>	Nakorn Ratchasima Province	Solar Power	21.60	8.64 (40%)	PEA	5 years/ 2022	Automatic renewal for a further 5 years every 5 years
<b>Solarta Power Projects</b>	Ayutthaya, Nakhon Pathom, and Suphanburi Provinces	Solar Power	42.30	20.73 (49%)	PEA	Ayutthaya Province : 5 years / 2021 Suphanburi and Nakhon Pathom Provinces : 5 years / 2022	Automatic renewal for a further 5 years every 5 years
<b>Songkhla Biomass Power Project</b>	Songkhla Province	Thermal	9.90	3.96 (40%)	PEA	20 years/2035	N/A
<b>Total</b>			<b>280.80</b>	<b>74.73</b>			
<b>Grand Total</b>			<b>280.80</b>	<b>74.73</b>			

# Portfolio by Core Business

## International Projects in Australia

Name of Power Plant/Project	Location	Technology	Total Installed Capacity (MW)	Installed Capacity contributed to the RATCH's Group (MW)	Terms of the PPA		
					PPA Party	Tenure/ Expiry Year	Renewal/ Option to Extend
<b>In Operation</b>							
<b>Townsville Power Plant</b>	North Queensland, Australia	Combined Cycle Gas Turbine	234	234 (100%)	AGL/Arrow	February 2025	N/A
<b>Kemerton Power Plant</b>	Western Australia, Australia	Open Cycle Gas/Diesel Turbine	308	308 (100%)	Synergy	October 2030	N/A
<b>BP Kwinana Power Plant (30 % owned by RAC)</b>	Western Australia, Australia	Cogeneration	118	35.40 (30%)	Verve Energy/BP	December 2021	N/A
<b>Starfish Hill Wind-Turbine Power Plant</b>	South Australia, Australia	Wind-Turbine	33	33 (100%)	Alinta Energy	In 2020	N/A
<b>Toora Wind-Turbine Power Plant</b>	Victoria, Australia	Wind-Turbine	21	21 (100%)	Merchant	N/A	N/A
<b>Windy Hill Wind-Turbine Power Plant</b>	Queensland, Australia	Wind-Turbine	12	12 (100%)	Ergon Energy Queensland (EEQ)	December 2018	N/A
<b>Total</b>			<b>726.00</b>	<b>643.40</b>			

# Portfolio by Core Business

## International Projects in Australia

Name of Power Plant/Project	Location	Technology	Total Installed Capacity (MW)	Installed Capacity contributed to the RATCH's Group (MW)	Terms of the PPA		
					PPA Party	Tenure/ Expiry Year	Renewal/ Option to Extend
<b>Under Construction</b>							
<b>Mount Emerald Wind Farm</b>	Queensland, Australia	Wind-Turbine	180.45	180.45 (100%)	Ergon Energy Queensland (EEQ)	12.5 year (Expected COD: Nov 2018)	N/A
<b>Collinsville Solar PV Project</b>	Queensland, Australia	Solar Power	42.50	42.50 (100%)	Alinta Energy	12.5 year (Expected COD: Dec 2018)	N/A
<b>Total</b>			<b>222.95</b>	<b>222.95</b>			
<b>Grand Total</b>			<b>948.95</b>	<b>866.35</b>			

# Portfolio by Core Business

## International Projects in Laos

Name of Power Plant/Project	Location	Technology	Total Installed Capacity (MW)	Installed Capacity contributed to the RATCH's Group (MW)	Terms of the PPA		
					PPA Party	Tenure/ Expiry Year	Renewal/ Option to Extend
<b>In Operation</b>							
<b>Nam Ngum 2 Hydroelectric Power Plant</b>	Laos	Hydro Power Plant	615	153.75 (25%)	EGAT	27 years/ 2038	N/A
<b>Hongsa Power Plant</b>	Sainyaburi Province, Laos	Lignite-Fired Power Plant	1,878	751.20 (40%)	EGAT & EDL	25 years/ 2040	N/A
<b>Total</b>			<b>2,493</b>	<b>904.95</b>			
<b>Under Construction</b>							
<b>Xe Pian - Xe Namnoy Project</b>	Attapue and Champasak provinces, Laos	Hydro Power Plant	410	102.50 (25%)	EGAT EDL	27 years/ 2046 (Expected COD: 2019)	N/A
<b>Total</b>			<b>410</b>	<b>102.50</b>			
<b>Grand Total</b>			<b>2,903</b>	<b>1,007.45</b>			

# Portfolio by Core Business

## International Projects in China & Republic of Indonesia

Name of Power Plant/Project	Location	Technology	Total Installed Capacity (MW)	Installed Capacity contributed to the RATCH's Group (MW)	Terms of the PPA		
					PPA Party	Tenure/ Expiry Year	Renewal/ Option to Extend
<b>Under Construction</b>							
<b>Guangxi Fangchenggang Nuclear Power (II)</b>	Fangchenggang , China	Nuclear Power	2,360	236 (10%)	N/A	30 year (Expected COD: 2021)	N/A
<b>Total</b>			<b>2,360</b>	<b>236</b>			
<b>Under Development</b>							
<b>Riau Combined-Cycle Power Plant</b>	Republic of Indonesia	Combined Cycle	287.81	141.03 (49%)	PT PLN (PERSERO)	20 year (Expected COD: 2021)	N/A
<b>Total</b>			<b>287.81</b>	<b>141.03</b>			
<b>Grand Total</b>			<b>2,647.81</b>	<b>377.03</b>			

# Portfolio by Core Business

## Related Businesses

Name of Power Plant/Project	Location	Technology	Total Installed Capacity (MW)	Installed Capacity contributed to the RATCH's Group (MW)	Terms of the PPA		
					PPA Party	Tenure/ Expiry Year	Renewal/ Option to Extend
<b>In Operation</b>							
<b>EDL-Generation</b>	Laos	Hydro Power Plant	1,131.15	114.36 (10.11%)	N/A	N/A	N/A
<b>EDL-Generation</b>	Laos	Solar Power	6.00	0.61 (10.11%)	N/A	N/A	N/A
<b>Total</b>			<b>1,137.15</b>	<b>114.97</b>			
<b>Under Development</b>							
<b>MRT Pink Line Project and MRT Yellow Line Project</b>	Nonthaburi and Bangkok Province	Elevated Straddle Monorail	~1,910 MW	~191.00 MW (10%)	On 16 June 2017, the joint venture companies entered into the Concession Contracts with MRTA.	30 years/2051 (Expected COD: 2021)	N/A
<b>Total</b>			<b>1,910</b>	<b>191.00</b>			
<b>Grand Total</b>			<b>3,047.15</b>	<b>305.97</b>			

# IPPs and SPPs in Thailand

## In Operation



**Project Cost (100%)**  
60,775 Million Baht

**Debt to Equity**  
2.3 : 1

**Project Cost (RATCH Portion)**  
60,775 Million Baht

### Ratchaburi Power Plant (RATCHGEN)



**Location**

Ratchaburi Province

**Technology**

Thermal & Combined Cycle

**Total Installed Capacity**

3,645 MW (holds 100%)

**PPA**

25-Year

**COD**

TH#1-2 : 31 Oct 2000  
CCGT #1-2 : 18 Apr 2002  
CCGT#3 : 1 Nov 2002

**Partner**

Ratchaburi Electricity Generating Company Limited holds 100%

### Tri Energy Power Plant (TECO)



**Location**

Ratchaburi Province

**Technology**

Combined Cycle

**Total Installed Capacity**

720 MW (holds 100%)

**PPA**

20-Year

**COD**

1 July 2000

**Partner**

Ratchaburi Electricity Generating Company Limited holds 100%

**Project Cost (100%)**

404.75 Million USD

**Debt to Equity**

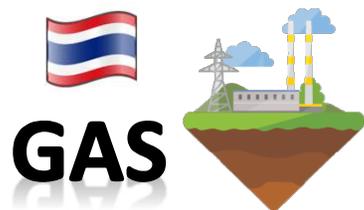
3 : 1

**Project Cost (RATCH Portion)**

- In 2005, RATCH holds 50% of the total share, at the amount 202.50 Million USD
- In 2014, RATCH has purchased 50% of the total share, at the amount 21.32 Million USD

# IPPs and SPPs in Thailand

## In Operation



### Project Cost (100%)

840 Million USD

### Debt to Equity

2.5 : 1

### Project Cost (RATCH Portion 25%)

210 Million USD

## Ratchaburi Power Plant (RPCL)



### Location

Ratchaburi Province

### Technology

Combined Cycle

### Total Installed Capacity

1,490 MW (372.5 MW holds 25 %)

### PPA

25-Year

### COD

Block 1: 1 March 2008

Block 2: 1 June 2008

### Partner

- Ratchaburi Alliances Company Limited holds 25%
- PAI International Power (Mauritius) Company Limited holds 25%
- Global Power Synergy Company Limited holds 15%
- Chubu Electric Power Company International B.V. holds 15%
- Saha-Union Public Co., Ltd. holds 10%
- Toyota Tsusho Corporation holds 10%

## Ratchaburi World Cogeneration (RW Cogen)



### Location

Ratchaburi Province

### Technology

Cogeneration

### Total Installed Capacity

234 MW (93.60 MW holds 40%)

### PPA

25-Year

### COD

Unit 1: November 2014

Unit 2: March 2015

### Partner

- Ratchaburi Electricity Generating Company Limited holds 40%
- Major Shareholder Group of Thai Agri Food PCL holds 60%

### Project Cost (100%)

10,620 Million Baht

### Debt to Equity

75 : 25

### Project Cost

(RATCH Portion 40%)

4,248 Million Baht

# IPPs and SPPs in Thailand

## In Operation



### Project Cost (100%)

6,000 Million Baht

### Debt to Equity

75 : 25

### Project Cost (RATCH Portion 40%)

2,400 Million Baht

## Nava Nakhon Electricity Generating (NNEG)



### Location

Pathum Thani Province

### Technology

Cogeneration

### Total Installed Capacity

139.13 MW (55.65 MW holds 40%)

### PPA

25-Year

### COD

3 June 2016

### Partner

- Ratchaburi Electricity Generating Company Limited holds 40%
- Global Power Synergy Public Company Limited holds 30%
- Nava Nakhon holds 30%

## NNEG Expansion Project

### Location

Pathum Thani Province

### Technology

Cogeneration

### Total Installed Capacity

60 MW (24 MW holds 40%)

### PPA

25-Year

### Expected COD

August 2020

### Partner

- Ratchaburi Electricity Generating Company Limited holds 40%
- Global Power Synergy Public Company Limited holds 30%
- Nava Nakhon holds 30%

### Project Cost (100%)

3,105 Million Baht

### Debt to Equity

75 : 25

### Project Cost (RATCH Portion 40%)

1,242 Million Baht

## Under Construction



# IPPs and SPPs in Thailand

## Under Construction



### Berkprai Cogeneration (Former name: Ratchaburi Cogeneration)

#### Location

Ratchaburi Province

#### Technology

Cogeneration

#### Total Installed Capacity

99.23 MW (34.73 MW holds 35%)  
Steam Generation 15 ton/hour

#### PPA

25-Year

#### Expected COD

In 2019

#### Progress

83.53% as of August 2018

#### Partner

- Ratchaburi Electricity Generating Company Limited holds 35%
- Rajburi Sugar Company Limited 65%

#### Project Cost (100%)

5,323 Million Baht

#### Debt to Equity

75 : 25

#### Project Cost (RATCH Portion 35%)

1,863 Million Baht

### About Berkprai Cogeneration

On 15<sup>th</sup> September 2014, Ratchaburi Electricity Generating Company Limited has entered into Shareholders Agreement with Rajburi Sugar Company Limited

On 30<sup>th</sup> October 2014, Ratchaburi Electricity Generating Company Limited purchased 35 % of Ratchaburi Cogeneration Company Limited's total shares from Rajburi Sugar Company Limited

On 27<sup>th</sup> January 2015, Ratchaburi Cogeneration Company Limited changed its name to Berkprai Cogeneration Company Limited (the project).

On 28<sup>th</sup> September 2016, the project increased its registered capital from 100 Million Baht to 1,331 Million Baht

On 6<sup>th</sup> June 2017, the project has signed Facilities Agreement with Bangkok Bank. The loan amount is 4,000 Million Baht for the period of 20 years from the agreement signed date.

# Renewable Projects in Thailand



Huay Bong 2 Wind-Turbine Power Project
<b>Location</b> Nakorn Ratchasima Province
<b>Technology</b> Wind-Turbine
<b>Total Installed Capacity</b> 103.5 MW (20.7 MW holds 20%)
<b>PPA</b> 5 years with automatic renewal for a further 5 years every 5 years
<b>COD</b> 8 February 2013
<b>Partner</b> <ul style="list-style-type: none"> <li>• RATCH holds 20%</li> <li>• Aeolus Power holds 60%</li> <li>• Chubu Electric Power Korat, BV holds 20%</li> </ul>

Huay Bong 3 Wind-Turbine Power Project
<b>Location</b> Nakorn Ratchasima Province
<b>Technology</b> Wind-Turbine
<b>Total Installed Capacity</b> 103.5 MW (20.7 MW holds 20%)
<b>PPA</b> 5 years with automatic renewal for a further 5 years every 5 years
<b>COD</b> 14 November 2012
<b>Partner</b> <ul style="list-style-type: none"> <li>• RATCH holds 20%</li> <li>• Aeolus Power holds 60%</li> <li>• Chubu Electric Power Korat, BV holds 20%</li> </ul>

<b>Project Cost (100%)</b> 6,100 Million Baht
<b>Debt to Equity</b> 70 : 30
<b>Project Cost (RATCH Portion 20%)</b> 1,220 Million Baht

<b>Project Cost (100%)</b> 6,500 Million Baht
<b>Debt to Equity</b> 70 : 30
<b>Project Cost</b> (RATCH Portion 20%) 1,300 Million Baht

# Renewable Projects in Thailand



## Solar Power Projects (Korat 3, Korat 4, Korat 7)



### Location

Nakorn Ratchasima Province

### Technology

Solar Power

### Total Installed Capacity

21.60 MW (8.64 MW holds 40%)

### PPA

5 years with automatic renewal for a further 5 years every 5 years

### COD

Korat 3 : 9 March 2012  
Korat 4 : 14 May 2012  
Korat 7 : 30 May 2012

### Partner

- Ratchaburi Energy Company Limited holds 40%
- Solar Power holds 60%

### Project Cost (100%)

1,950 Million Baht

### Debt to Equity

75 : 25

### Project Cost

(RATCH Portion 40%)  
780 Million Baht

## Solarta Power Projects



### Location

Ayutthaya Province  
Suphan Buri Province  
Nakon Pathom Province

### Technology

Solar Power

### Total Installed Capacity

42.30 MW (20.73 MW holds 49%)

### PPA

5 years with automatic renewal for a further 5 years every 5 years

### COD

Ayutthaya Province : 7 April 2011  
Suphan Buri Province : In 2012  
Nakon Pathom Province : In 2012

### Partner

- Ratchaburi Energy Company Limited holds 49%
- Yanhee Power holds 51%

### Project Cost (100%)

4,400 Million Baht

### Debt to Equity

75 : 25

### Project Cost

(RATCH Portion 49%)  
2,156 Million Baht

# Renewable Projects in Thailand

## BIOMASS



**In Operation**

### Songkhla Biomass Power Project

#### Location

Songkhla Province

#### Technology

Thermal Power Plant

#### Total Installed Capacity

9.9 MW (3.96 MW holds 40%)

#### VSPP

20-Year

#### COD

9 November 2015

#### Partner

- Ratchaburi Energy Company Limited holds 40%
- Precise Power Producer holds 40%
- Assiddeek Saving Cooperative holds 20%

#### Project Cost (100%)

846 Million Baht

#### Debt to Equity

75 : 25

#### Project Cost

(RATCH Portion 40%)  
338.40 Million Baht

### ESP



### Boiler & Economizer



### Fuel Storage Silo



# International Projects



**In Operation**

**Project Cost (100%)**  
30,832 Million Baht

**Debt to Equity**  
2.5 : 1

**Project Cost**  
(RATCH Portion 25%)  
7,708 Million Baht

## Num Ngum 2 Hydroelectric Power Plant



**Location**  
Lao PDR

**Technology**  
Hydro Power Plant

**Total Installed Capacity**  
615 MW (153.75 MW holds 25%)

**PPA**  
27-Year

**IOD/COD**  
In 2011 / In 2013

- Partner**
- SEAN\* holds 75%
  - GOL holds 25%
- \* Remark: SEAN's shareholder consist of
- RATCH holds 33.33%
  - CK Power PCL holds 55.99%
  - Other holds 10.68%

## Hongsa Power Plant Unit 1-3



**Location**  
Lao PDR

**Technology**  
Lignite-Fired

**Total Installed Capacity**  
1,878 MW (751.2 MW holds 40%)

**PPA**  
25-Year

**COD**  
Unit 1 : 2 June 2015  
Unit 2 : 2 November 2015  
Unit 3 : 2 March 2016

- Partner (Power Plant)**
- RHIS holds 40%
  - Banpu Power holds 40%
  - Lao PDR holds 20%



**In Operation**

## Partner (Phu Fai Mining)

- RHIS holds 37.5%
- Banpu Power holds 37.5%
- Lao PDR holds 25%

**Project Cost (100%)**  
3,710 Million USD

**Debt to Equity**  
75 : 25

**Project Cost (RATCH Portion 40%)**  
1,484 Million USD

# International Projects



**Under Construction**

## Xe-Pian – Xe Namnoy Project

### Location

Lao PDR

### Technology

Hydro Power Plant

### Total Installed Capacity

410 MW (102.5 MW holds 25%)

### PPA

27-Year

### Expected COD

In 2019

### Progress

92.59% as of August 2018

### Partner

- RATCH holds 25%
- SK Engineering holds 26%
- Korea Western Power holds 25%
- Lao PDR holds 24%

### Project Cost (100%)

1,020 Million USD

### Debt to Equity

70 : 30

### Project Cost (RATCH Portion 25%)

255 Million USD



# International Projects



Townsville Power Plant

<b>Location</b> North Queensland, Australia
<b>Technology</b> Combined Cycle Gas Turbine
<b>Total Installed Capacity</b> 234 MW (234 MW holds 100%)
<b>COD</b> In 1999
<b>Contract end date</b> February 2025
<b>Contract counterparty</b> AGL / Arrow

Kemerton Power Plant

<b>Location</b> Western Australia
<b>Technology</b> Open Cycle Gas / Diesel Turbine
<b>Total Installed Capacity</b> 308 MW (308 MW holds 100%)
<b>COD</b> In 2005
<b>Contract end date</b> October 2030
<b>Contract counterparty</b> Synergy

BP Kwinana Power Plant

<b>Location</b> Western Australia
<b>Technology</b> Co-generation
<b>Total Installed Capacity</b> 118 MW (35.40 MW holds 30%)
<b>COD</b> In 1996
<b>Contract end date</b> December 2021
<b>Contract counterparty</b> Verve Energy / BP

# International Projects



Toora

<b>Location</b> Victoria, Australia
<b>Technology</b> Wind Farm
<b>Total Installed Capacity</b> 21 MW (21 MW holds 100%)
<b>COD</b> In 2002
<b>Contract end date</b> n.a.
<b>Contract counterparty</b> Merchant

Starfish Hill

<b>Location</b> South Australia
<b>Technology</b> Wind Farm
<b>Total Installed Capacity</b> 33 MW (33 MW holds 100%)
<b>COD</b> In 2003
<b>Contract end date</b> In 2020
<b>Contract counterparty</b> Alinta Energy

Windy Hill

<b>Location</b> Queensland, Australia
<b>Technology</b> Wind Farm
<b>Total Installed Capacity</b> 12 MW (12 MW holds 100%)
<b>COD</b> In 2000
<b>Contract end date</b> December 2018
<b>Contract counterparty</b> Ergon Energy Queensland

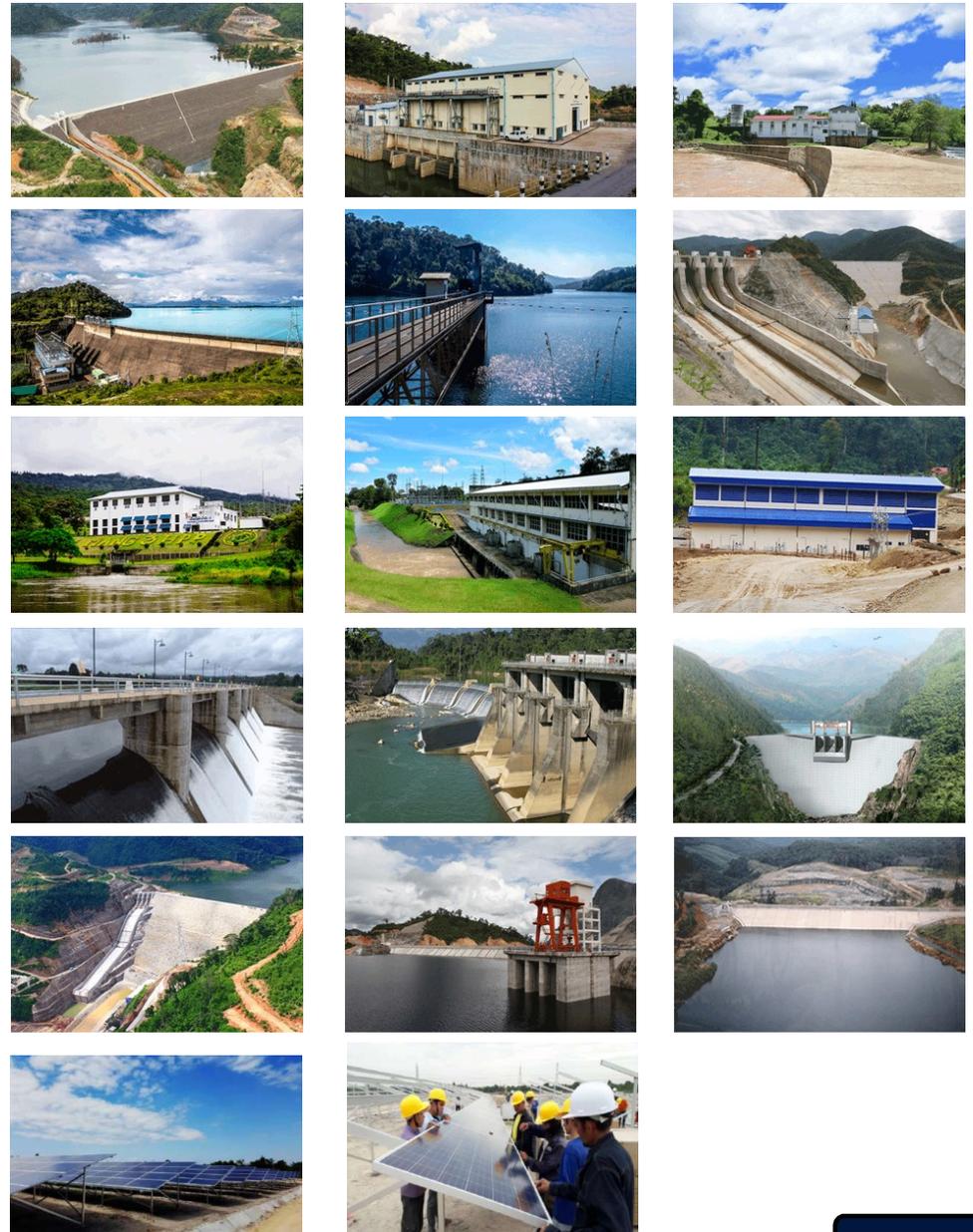
# Related Businesses



## In Operation

### EDL-Generation Public Company (EDL-Gen)

<b>Location</b> Lao PDR	<b>Location</b> Lao PDR
<b>Technology</b> Hydro Power Plant	<b>Technology</b> Solar Power
<b>Total Installed Capacity</b> 1,131.15 MW (114.36 MW holds 10.11%*)	<b>Total Installed Capacity</b> 6 MW (0.61 MW holds 10.11%*)
<b>Grand Total Installed Capacity</b> 1,137.15 MW (114.97 MW holds 10.11%*)	
<b>Shareholders</b>	
<ul style="list-style-type: none"> <li>• RATCH-Lao holds 5.65%</li> <li>• RH International (Singapore) Corporation Pte. Limited holds 4.46%</li> <li>• EDL holds 75%</li> <li>• Others holds 14.89%</li> </ul>	
<b>*Remark:</b>	
<ul style="list-style-type: none"> <li>• EDL-Gen has been traded on Lao Securities Exchange since 2010.</li> <li>• In 2016, RATCH acquired 169.78 million shares, or equivalent to 3,254 Million Baht.</li> </ul>	



# International Projects



**Under Construction**



Sunrise photo of WTG23 from WTG30



## Mount Emerald Wind Farm

### Location

Queensland, Australia

### Technology

Wind Farm

### Total Installed Capacity

180.45 MW (180.45 MW holds 100%)

### Expected COD

November 2018

### Contract end date

December 2030

### Contract counterparty

Ergon Energy Queensland\*

\* State Enterprise of Queensland, Australia

## About Mount Emerald Wind Farm

On 27<sup>th</sup> November 2016, Mount Emerald Wind Farm Pty has entered into PPA with Ergon Energy Queensland ("EEQ") a power state enterprise of Queensland. The agreement will expire on 31<sup>st</sup> December 2030 or totaling the agreement period of approximately 12.5 years.

On 28<sup>th</sup> June 2016, RAC has entered into share purchase agreement of Mount Emerald Wind Farm Pty with Port Bajool Pty Ltd. who had jointly invested in the Project with RAC in the proportion of 50 : 50. After the purchase was complete, RAC would hold 100 % stake in Mount Emerald Wind Farm Pty.

On 1<sup>st</sup> November 2016, Mount Emerald Wind Farm Pty the developer of Mount Emerald Wind Farm Project, has successfully sourced loan for the development of the Project by entering into Financial Agreement with 4 financial institutes namely Australia and New Zealand Bank, National Australia Bank, The Bank of Tokyo Mitsubishi, and Societe Generale.



Wind farm substation nearing completion



New power pole ready for connection

# International Projects



## Under Construction



Collinsville Solar PV Project
<b>Location</b> Queensland, Australia
<b>Technology</b> Solar Power
<b>Total Installed Capacity</b> 42.50 MW (42.50 MW holds 100%)
<b>Expected COD</b> December 2018
<b>Contract end date</b> December 2030
<b>Contract counterparty</b> Braemar Power Projects
<b>Project Cost (100%)</b> 95 Million AUD*
* Loan from financial institute at approximately 60 percent, grant fund from ARENA at 10 percent and equity investment at approximately 30 percent.



Source: <http://www.cimic.com.au/>

**Remark**  
The Project has Power Purchase Agreement with the Braemar Power Projects, a subsidiary of Alinta Energy, for 70 percent. Such Power Purchase Agreement will be expired on 31<sup>st</sup> December 2030. The other 30 percent of the generated electricity will be sold in Australia's National Electricity Market (NEM).

# International Projects



# NUCLEAR



## Under Construction

### Guangxi Fangchenggang Nuclear Power (II)

#### Location

Fangchenggang , China

#### Technology

HPR1000 (Hualong-1)

#### Total Installed Capacity

2,360 MW (236 MW holds 10%)  
(2 unit x 1,180 MW)

#### PPA

30-Year

#### Expected COD

In 2021

#### Partner

- China General Nuclear Power Corporation (CGN) holds 51%
- Guangxi investment Group Co./ Ltd (GIG) holds 39%
- RATCH China Power Limited holds 10%

#### Project Cost (100%)

200,000 Million Baht

#### Debt to Equity

62.5 : 37.5

#### Equity Investment (RATCH Portion 10%)

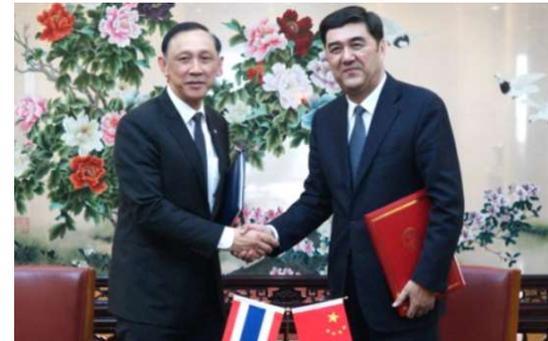
7,500 Million Baht



The signing of the equity joint venture contract (Image: CGN)

On 25<sup>th</sup> January 2016, RATCH has agreed to take a stake in the two Hualong One reactors being built as Phase II of the Fangchenggang nuclear power plant in China's Guangxi province.

source: world nuclear news



Kanchararat (left) and Bekri shake on the agreement (Image: NEA)

On 29<sup>th</sup> March 2017, China and Thailand have signed an agreement to cooperate in the peaceful use of nuclear energy. The agreement was signed in Beijing by Nur Bekri, director of China's National Energy Administration (NEA), and Thai energy minister Anantaporn Kanchararat.

source: world nuclear news

# International Projects



**Under Development**

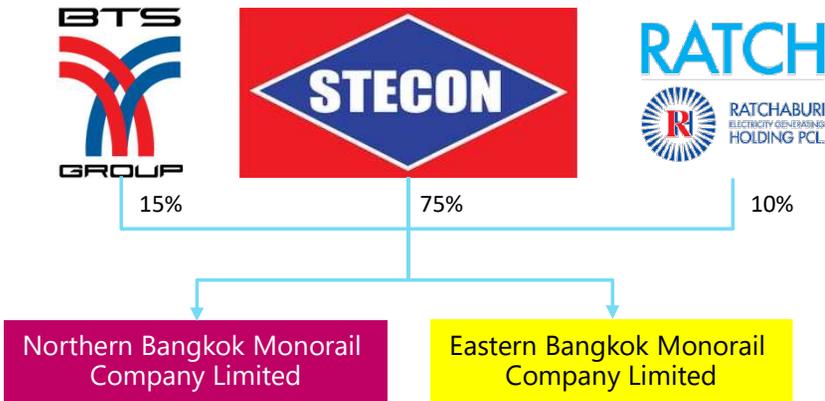


## Riau Combined-Cycle Power Plant

<b>Location</b>	Republic of Indonesia
<b>Technology</b>	Combined-Cycle
<b>Total Installed Capacity</b>	287.81 MW (141.03 MW holds 49%)
<b>PPA</b>	20-Year
<b>Purchaser</b>	PT PLN (PERSERO)
<b>Expected COD</b>	In 2021
<b>Partner</b>	<ul style="list-style-type: none"> <li>RH International (Singapore) Corporation Pte. Limited holds 49%</li> <li>PT Medco Power Sentral Sumatera holds 51%</li> </ul>
<b>Project Cost (100%)</b>	300 Million USD
<b>Debt to Equity</b>	75:25
<b>Equity Investment (RATCH Portion 49%)</b>	36.75 Million USD

# Related Businesses

## MRT Pink Line Project and the MRT Yellow Line Project



	Pink Line	Yellow Line
<b>Route</b>	Khae Rai-Min Buri	Lat Phrao - Samrong
<b>Line length</b>	34.5 km	30.4 Km
<b>Stations</b>	30	23

### About MRT Pink Line Project and the MRT Yellow Line Project

- On 7 November 2016, the Company, BTS Group Holding Public Company Limited (BTS) and Sino-Thai Engineering & Construction Public Company Limited (STEC) have jointly submitted the proposals under the name of "BSR Joint Venture" for the biddings of the MRT Pink Line and the MRT Yellow Line Project.
- On 14 December 2016, MRTA has issued letters No. MRTA 004/3227 and MRTA 004/3228, notifying that BSR Joint Venture was the bidder who proposed the best offer for the MRT Pink Line Project and the MRT Yellow Line Project.
- On 12 June 2017, the BSR Joint Venture established companies namely "Northern Bangkok Monorail Company Limited" and "Eastern Bangkok Monorail Company Limited".
- On 16 June 2017, Northern Bangkok Monorail Company Limited and Eastern Bangkok Monorail Company Limited have entered into the Concession Contracts including of the obligation for extensions of the MRT Pink Line Project and MRT Yellow Line Project with Mass Rapid Transit Authority Of Thailand (MRTA).
- On 10 October 2017, the BSR Joint Venture signed the syndicated loan agreement between Bangkok Bank, Siam Commercial Bank and Krung thai Bank at a total value of up to THB 63,360 Million

# RATCH



RATCHABURI  
ELECTRICITY GENERATING  
HOLDING PCL.

# Q & A



# Thank you