



Thai Solar Energy Public Company Limited

Presentation 3Q2020

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AGENDA



- **COMPANY OVERVIEW**

Summarize TSE's business

- **UPDATE 2020**

Recap what happen in the year 2020
and update new projects

- **FINANCIAL HIGHLIGHTS 3Q2020**

Represent TSE's Financial Statement
3Q2020

- **APPENDIX**

TSE's Structure and current projects



VISION and MISSION

VISION:

To become a world-class regional leader in providing renewable energy through reliable technologies to serve both commercial and social societies.

MISSION:

To establish a solid footprint in Thailand in the solar power industry and expand into other renewable energies as well as developing an international solar power business focusing in Asia & Oceania regions.

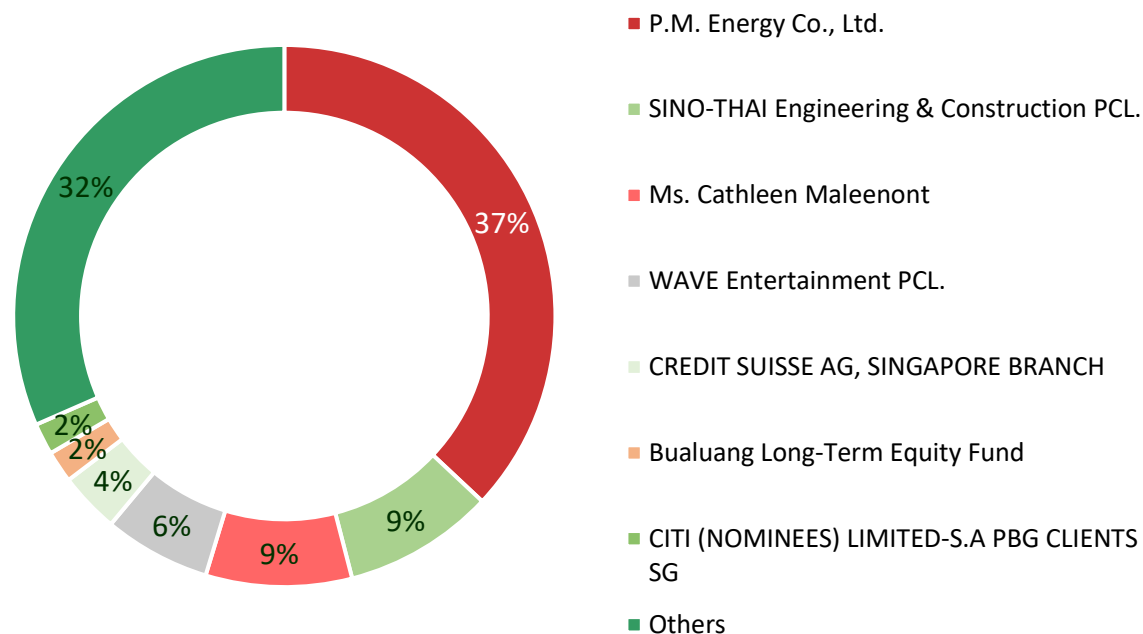
COMPANY OVERVIEW

- Milestones
- Core Business
- Portfolio Summary
- Capacity Growth



COMPANY OVERVIEW

TSE's Major Shareholders (as of 3 JUL 2020)



TSE's 4 Core Businesses:

- 1) Solar PV Farms
- 2) Solar PV Rooftop
- 3) Biomass
- 4) Floating Solar Farm

Listed in:

TSE was established in 2008, and firstly listed in MAI on 30 OCT 2014. Now, TSE has been moved to SET since 14 May 2019.

Paid-up Capital:

THB 2,117 million

Rating:

CG Rating:



Credit Rating: BBB- stable

MILESTONES

2008 - 2016

- 2008: > Established TSE
- 2011: > **Majority owned by Dr. Cathleen Maleenont**
> COD Solar Thermal (4.5 MW)
- 2013: > COD Solar PV TH 5 projects* (40 MW)
*Partnership with GPSC (TSE 60%)
- 2014: > **Listed in MAI on 30 OCT 2014**
> COD Solar PV TH 5 projects* (40 MW)
*Partnership with GPSC (TSE 60%)
> COD Solar Rooftop 5 Projects (5 MW)
- 2015: > Expanded TSE's business operation in Japan
> COD Solar PV JP 1 project (0.5 MW)
> COD Solar Rooftop 9 projects (9 MW)
- 2016: > COD Solar PV Co-Op 1 project (1 MW)
> COD Solar PV JP 4 projects (6.49 MW)
> Invested in Biomass 3 projects

2017 - 2019

- 2017: > **Large Investment in Japan**
"Onikoube project" (147 MWp)
- 2018: > COD Biomass 3 projects (22.2 MW)
> COD Solar PV JP: Jyoso (1.25 MW)
> Acquired a new project "INS" in Ang Thong province (2.0 MW) in OCT 2018
- 2019: > COD Solar PV JP: Hanamizuki (13.5 MW)
> Fully Operate Biomass 3 projects (22.2 MW)
> **Moved to SET on 14 MAY 2019**
> Capital Increase to 2,117.7 MB. completely in OCT 2019.
Note: TSR 212 million shares: Total 530 MB.
> Acquired:
 1. "BSS" in Ayutthaya province (5 MW) in MAR 2019
 2. "BSE" in Udonnathani province (5 MW) in AUG 2019
 3. "SSP" in Ang Thong province (8 MW) in NOV 2019

2020

- 2020: > Start project "Onikoube" Construction and receive project loan from BBL
> Invested in a Floating Solar PV farm project "BPT" in Prachinburi province (8.0 MW) in JUN 2020
> Acquired: "EES" in Krabi province (5.0 MW) in JUL 2020
> Disposed: "BSE" in Udonnathani province (5.0 MW) in SEP 2020



Note: All new acquired projects have been COD already.

CORE BUSINESS



SOLAR PV FARMS

23 projects (TH+JP)

255.74 MWac

(223.74 MWe)



SOLAR PV ROOFTOPS

14 projects

14 MWac



BIOMASS

3 projects

22.2 MWac



FLOATING SOLAR

1 project

8 MWac

(as of October, 2020)

PORTFOLIO SUMMARY

Total Equity Capacity

158.94 MWac

(126.94 MWe)

In Operation

141 MWac

(Onikoube 133 MWac)

+

(Floating Solar 8 MWac)

Under Construction

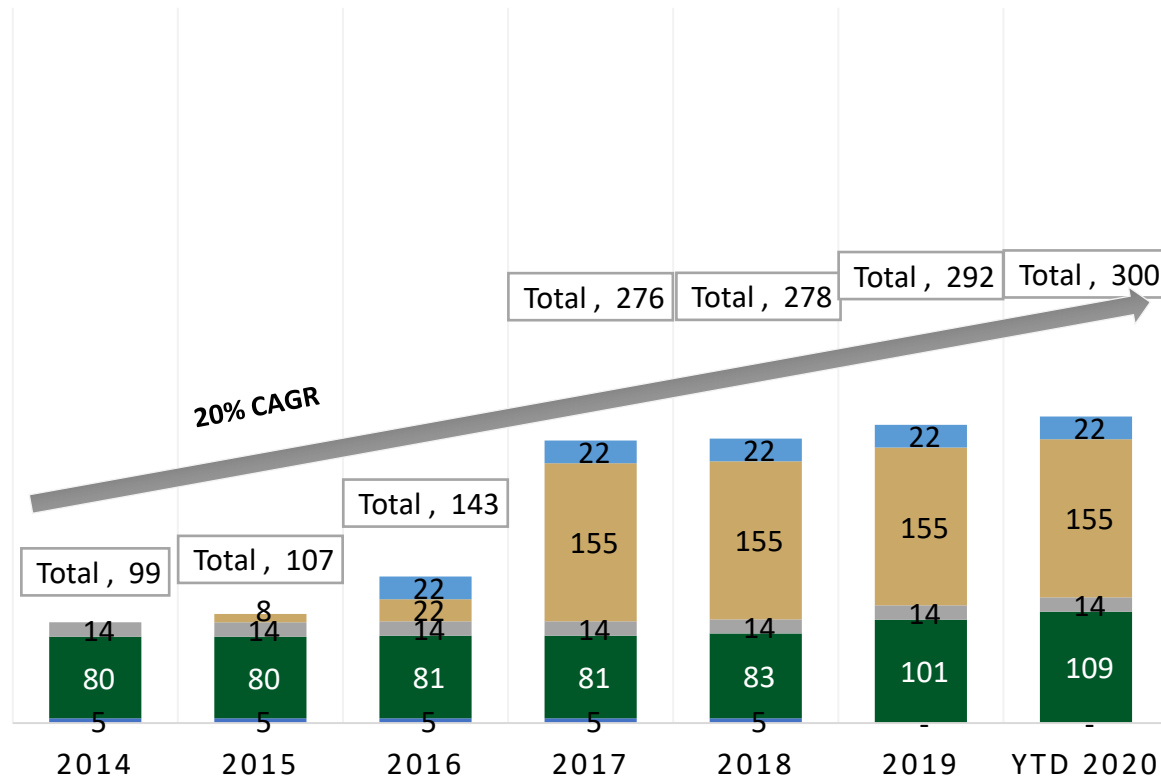
Project Types	Operated By	Ownership (%)	No. of Sites	COD Year	Installed Capacity (MWDC)	Contract Capacity (MWAC)	Equity Capacity (MWe)
Solar PV Farms							
Thailand:							
	TSR	60	10	2013 - 2014	104.8	80	48
	SV	100	5	2013, 2015, 2016, 2018	22.7	21	21
Japan:							
	TSI	100	7	2015, 2016, 2017, 2018, 2019	28.54	21.74	21.74
	OSP	100	1	SCOD 4Q2022	147	133	133
Solar PV Rooftops	TSER	100	14	2014 - 2015	14	14	14
Biomass	TCE	100	3	2018	25.8	22.2	22.2
Floating Solar	SV	100	1	SCOD 1Q2021	8	8	8
Total			41		350.84	299.94	267.94

(as of October, 2020)

CAPACITY GROWTH

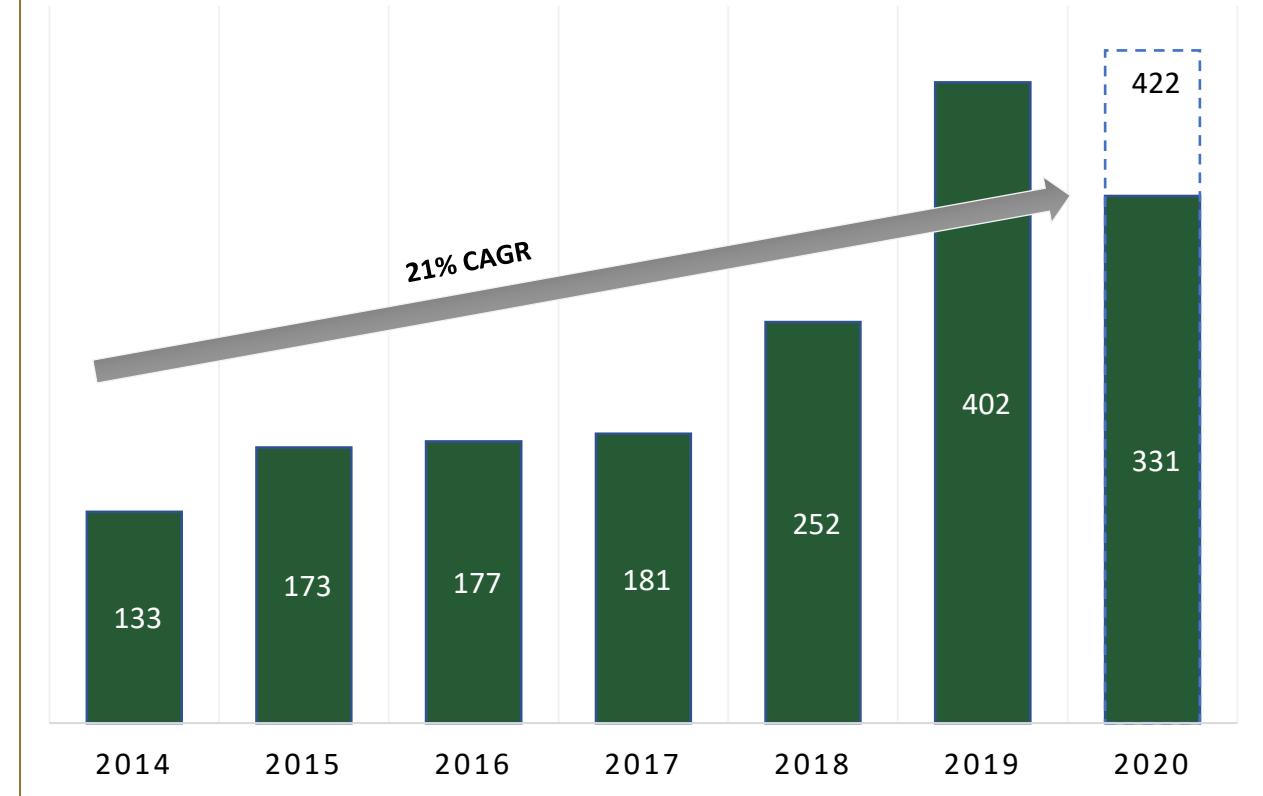
ACQUIRE CAPACITY (MW PPA)

■ Thermal ■ PV Farms ■ PV Rooftops ■ PV Japan ■ Biomass ■ Total



POWER OUTPUT PRODUCTION (MIL KWH)

■ Actual ■ Forecast



(as of October, 2020)

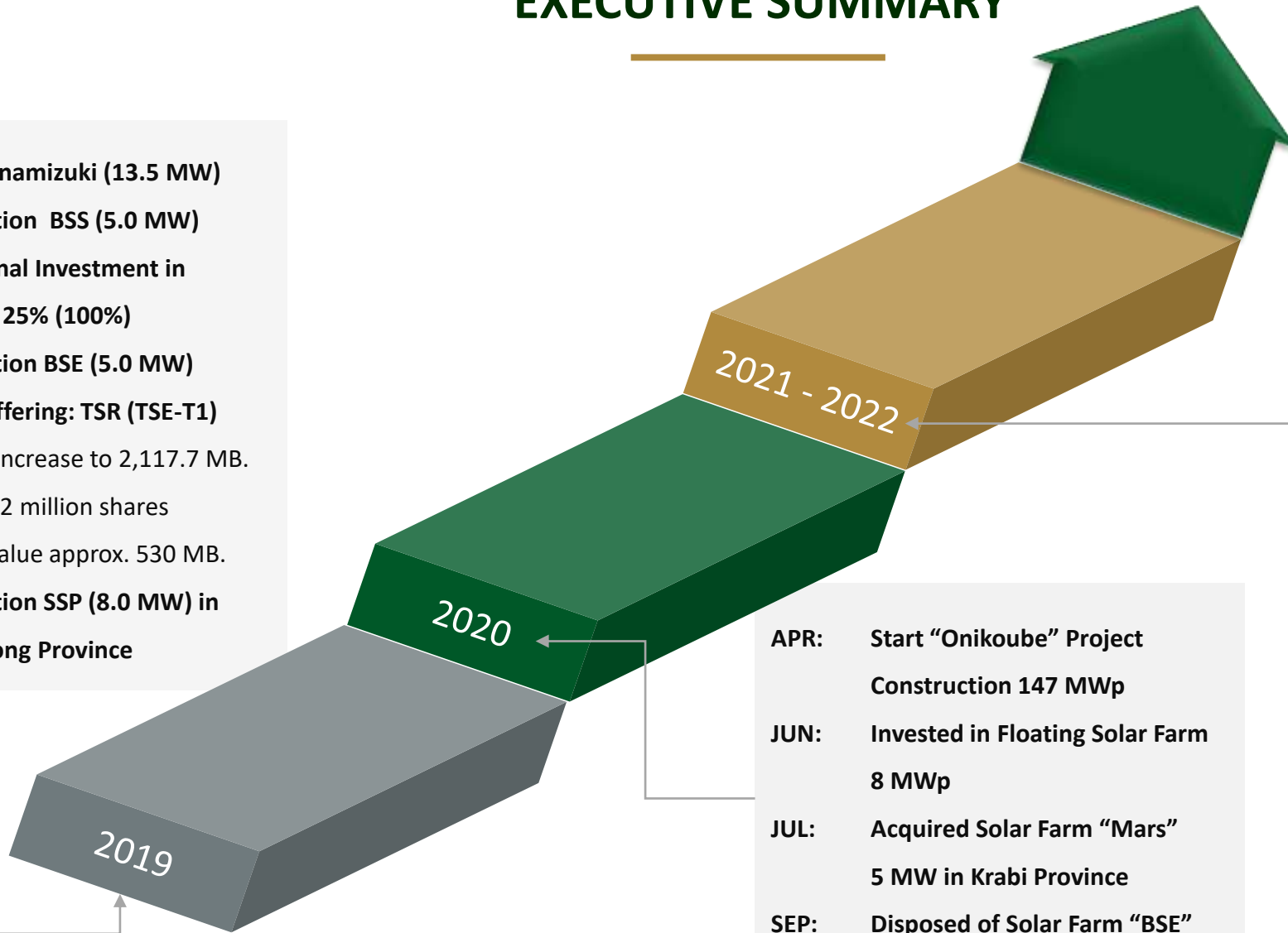
UPDATE 2020

- Executive Summary
- Update New Projects
 - Onikoube Project (147 MWp)
 - Floating Solar Farm (8 MWp)
 - Solar Farm Krabi (5 MWp)



EXECUTIVE SUMMARY

JAN: COD Hanamizuki (13.5 MW)
MAR: Acquisition BSS (5.0 MW)
JUL: Additional Investment in OSW of 25% (100%)
AUG: Acquisition BSE (5.0 MW)
OCT: Right Offering: TSR (TSE-T1)
 Capital Increase to 2,117.7 MB.
 - TSR 212 million shares
 - Total value approx. 530 MB.
NOV: Acquisition SSP (8.0 MW) in Ang Thong Province



APR: Start “Onikoube” Project
 Construction 147 MWp
JUN: Invested in Floating Solar Farm
 8 MWp
JUL: Acquired Solar Farm “Mars”
 5 MW in Krabi Province
SEP: Disposed of Solar Farm “BSE”
 5 MW in Udonrthani Province

THAILAND

- Acquiring new projects approx. 50 MW PPA within 1 – 2 years
- Planning to bid for Power Plant Community approx. 50 MW PPA

OVERSEAS

- Investing in new renewable energy projects overseas approx. 100 – 200 MW PPA within 3 years

UPDATE NEW PROJECTS



Onikoube Project (147 MWp)

- Start Project Construction in April, 2020
- Project Financing by BBL THB 8.6 bn.
- SCOD 4Q2022



Floating Solar Farm (8 MWp)

- Invested in June, 2020
- SCOD 31 MAR 2021
- PPA Period 25 years



Solar Farm Krabi (5 MWp)

- Completed acquisition in July 2020
- COD 29 DEC 2018
- PPA Period 25 years

(as of October, 2020)

ONIKOUBE PROJECT

Project Area



Summary of Project

Installed Capacity (MWp):	147
Selling Capacity (MW):	133
Purchase Rate (FiT JP¥):	36
Location:	Miyagi, Japan
Off-taker:	Tohoku Utility
SCOD:	4Q2022
Status:	Under Construction
Operated By:	OSP

ONIKOUBE PROJECT



Project Components	
EPC by:	TOSHIBA
PV Module by:	Trina Solar
Inverter by:	Huawei

TOSHIBA



ONIKOUBE PROJECT

Work Back Timeline



**METI's one-year rule requires resubmission of a business plan in order to secure project's FiT price and tenor year under the condition that the project is ready for the construction and to COD within a certain timeline. The conditions required by METI such as, EIA Approval, Forest Permit. Onikoube does not subject to such requirements so the project successfully secures FiT price under the new rule.*

ONIKOUBE PROJECT

Construction in Progress



Construction had been started since 1Q2020. EPC mainly focuses on civil work so solar module installation can be speedily installed in later stage. Solar modules are planned to be placed on its original landscape conditions. The overall progress is expected to be up to 25% by the end of this year. EPC has plan to achieve 75% of PV modules installation complete by 2021 and SCOD within 4Q2022.

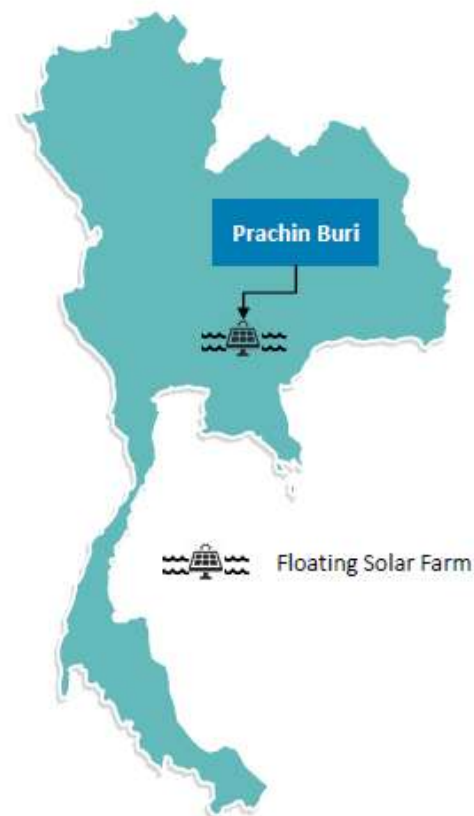
ONIKOUBE PROJECT

Construction in Progress



Construction progress on pilling work to be completed by 4Q2020 for the North side golf course and 12% PV modules installation progress on the left hand side picture. The pilling work is on going per plan on the South side golf course area as shown in the right hand side picture.

FLOATING SOLAR FARM



Summary of Project

Installed Capacity (MWp):	8
Selling Capacity (MWac):	8
PPA Type:	Private PPA
PPA Period:	25 years
Location:	Kabinburi Industrial Estate Prachinburi, Thailand
Off-Taker:	HITACHI
SCOD:	1Q2021 (31 MAR 2021)
Operated By:	SV (TSE's subsidiary)

FLOATING SOLAR FARM



EPC Components

Modules by:	Trina Solar
Floating material and Mounting structure:	SCG Thailand
Inverter by:	String type - Huawei
Electrical apparatus:	Switchgear - Siemen, Transformer - Ekarat



FLOATING SOLAR FARM

Construction in Progress

2020

JUNE

- Invested in “Floating Solar Farm” Project 8 MWp in Prachinburi Province

2020 -
2021

3Q2020 – 1Q2021

- Construction has started in 3Q2020.

2021

1Q2021

- SCOD 1Q2021 (31 MAR 2021)
- Operated by: SV (TSE’s subsidiary)



SOLAR FARM KRABI



Summary of Project

Installed Capacity (MWp):	5
Selling Capacity (MW):	5
Purchase Rate (FiT THB):	4.12
Location:	Krabi, Thailand
Off-Taker:	PEA
COD:	29 DEC 2018
Operated By:	SV

FINANCIAL HIGHLIGHTS 3Q2020

- Income Statement (3M) (9M)
- Total Revenue / EBITDA / Net Profit / Net Profit Margin
- ROE / D/E Ratio / EPS
- Financial Position as of 30 SEP 2020
- Debt Structure 3Q2020

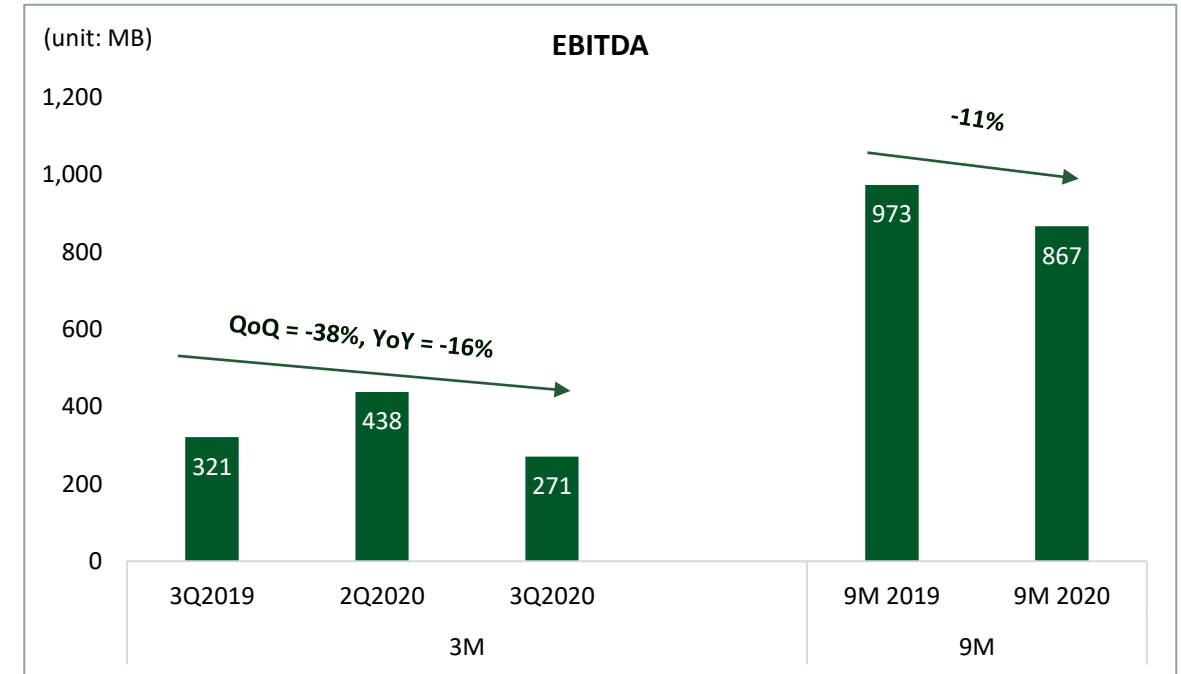
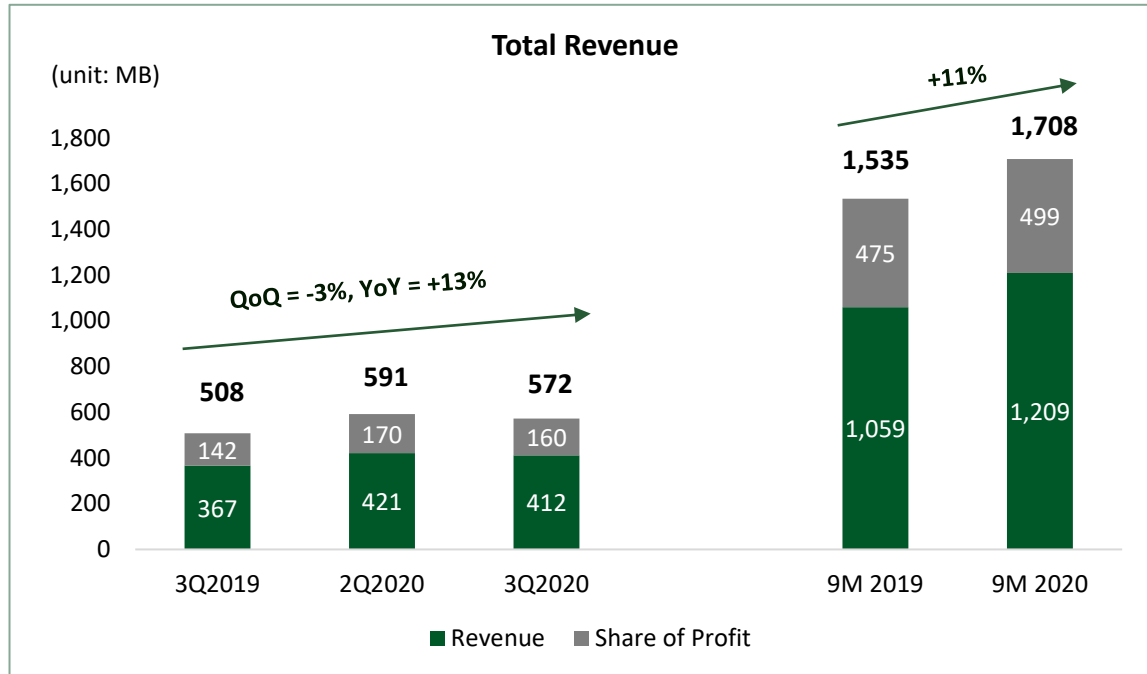


INCOME STATEMENT

Statement of Comprehensive Income	(3M)			(9M)		
	3Q2020	3Q2019	% Change	3Q2020	3Q2019	% Change
Revenue						
Electricity Sales	396,605	347,441	14%	1,163,934	995,447	17%
Management Fee	11,934	13,375	-11%	35,044	37,395	-6%
Total Revenue	408,539	360,816	13%	1,198,978	1,032,842	16%
COGs	(258,764)	(226,147)	14%	(758,765)	(645,795)	17%
Gross Profit	149,775	134,669	11%	440,213	387,047	14%
Other Income	3,540	6,084	-42%	10,361	26,359	-61%
Administrative Expenses	(59,828)	(46,414)	29%	(219,635)	(157,563)	39%
Loss (gain) from exchange rate	(87,578)	(313)	27880%	(158,695)	(4,679)	3292%
Finance costs	(95,186)	(27,233)	250%	(250,837)	(141,127)	78%
Share of Profit from joint ventures	160,292	141,568	13%	498,870	475,332	5%
Profit before Income Tax	71,015	208,361	-66%	320,277	585,369	-45%
Income Tax	267	(1,788)	-115%	316	(932)	-134%
Profit from Operation	71,282	206,573	-65%	320,593	584,437	-45%
Currency translation differences	271,081	(39,068)	-794%	495,473	(183,771)	-370%
Change in fair value of hedging derivatives	(6,497)		100%	(9,411)		100%
Total Comprehensive Income	335,866	167,505	101%	806,655	400,666	101%
Profit Attributable to:						
Owners of the Parent	71,119	204,796	-65%	320,027	559,917	-43%
Non-Controlling Interests	163	1,777	-91%	566	24,520	-98%
	<u>71,282</u>	<u>206,573</u>	-65%	<u>320,593</u>	<u>584,437</u>	-45%
Total Comprehensive Income Attributable to:						
Owners of the Parent	335,491	165,703	102%	805,705	376,092	114%
Non-Controlling Interests	375	1,802	-79%	950	24,574	-96%
	<u>335,866</u>	<u>167,505</u>	101%	<u>806,655</u>	<u>400,666</u>	101%

TOTAL REVENUE

EBITDA



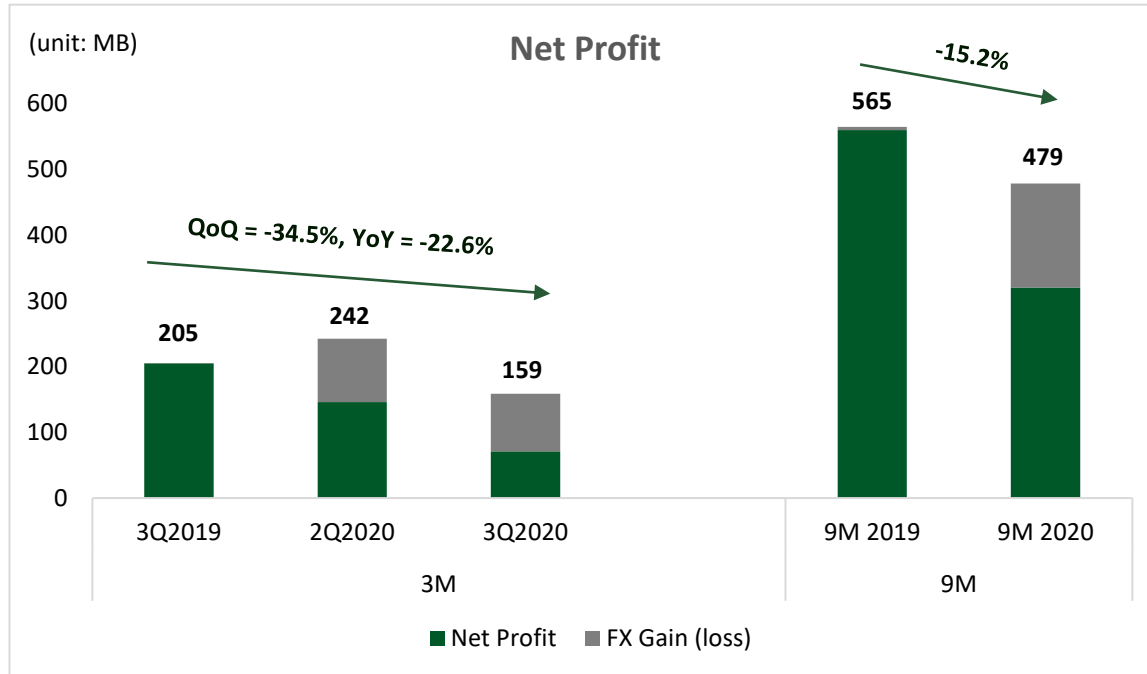
Total Revenue

Total revenue of 3Q2020 (3M) increased 13% (YoY) due to the revenue recognition fully from 3 new projects (totaling 18 MW) that were acquired since 2019.

EBITDA

EBITDA of 3Q2020 (3M) decreased 16% (YoY) due to the recognition of loss from exchange rate which occurred from loans in foreign currency of 87.6 MB in 3Q2020.

NET PROFIT



Net Profit

Net Profit in 3Q2020 (3M) decreased 65% (YoY) which was mainly due to FX loss of 88 MB and Finance Costs. However, FX loss was considered as an accounting transaction and it does not have impact on the Company's cash flow and performance.

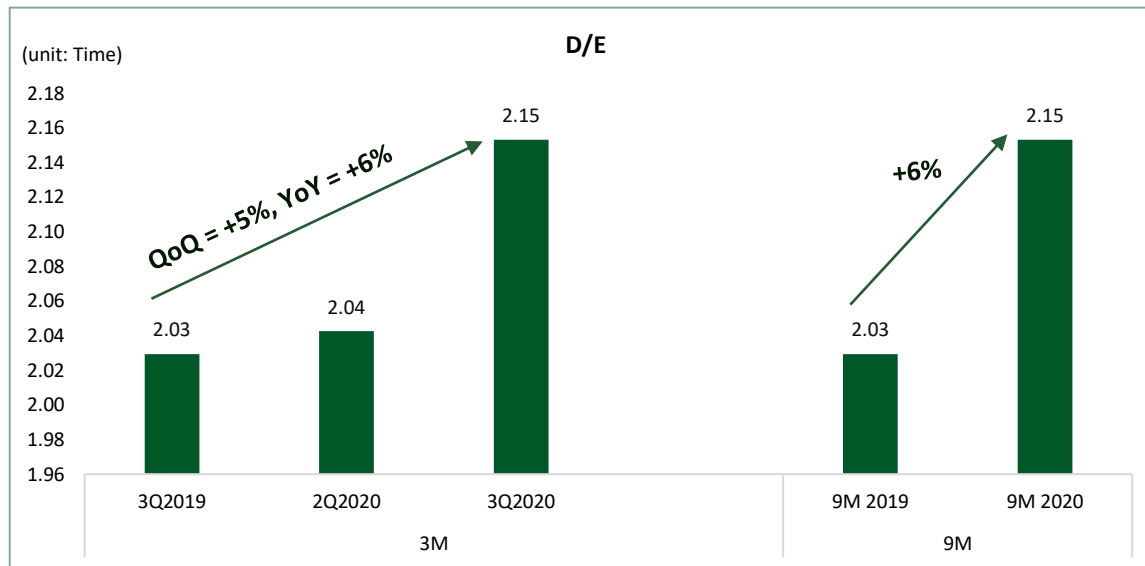
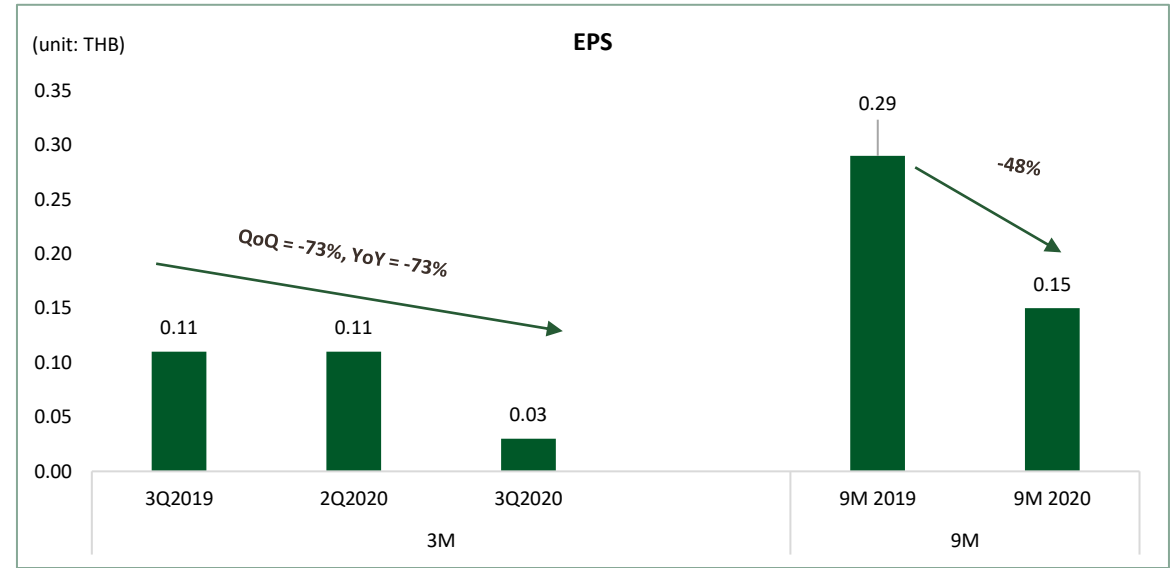
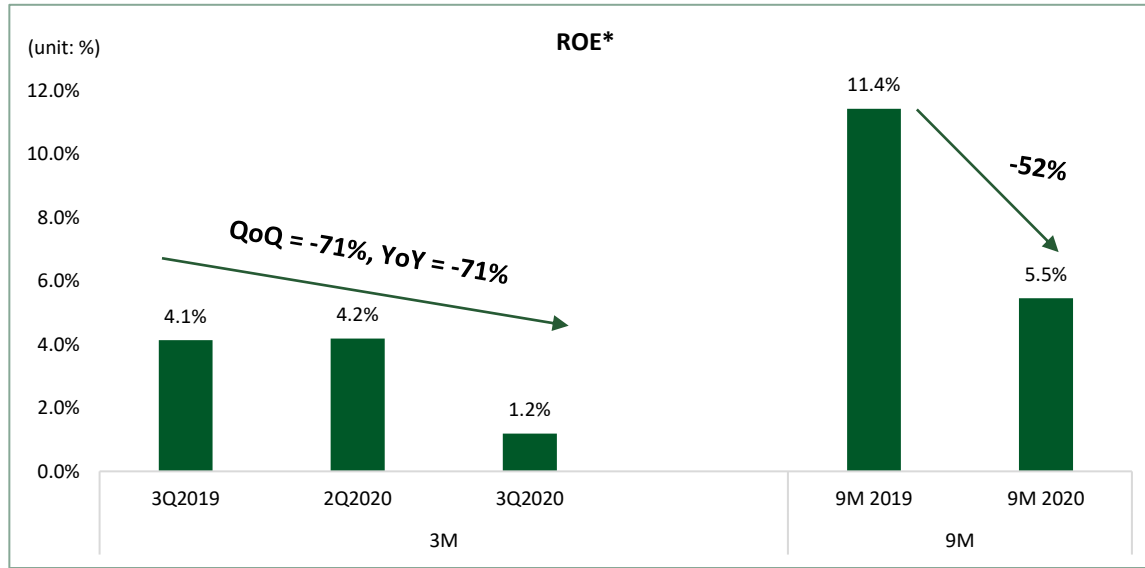
On the other hand, if excluding FX loss in 3Q2020 (3M), Net Profit declined by 22.6%. This was mostly impacted by Finance costs of Onikoube project that the construction has been started since 2Q2020.

(Unit : MB)	(3M)			(9M)	
	3Q2019	2Q2020	3Q2020	3Q2020	3Q2019
Net Profit	205	242	71	560	320
FX Gain (Loss)	(0.3)	96	(88)	(5)	(159)
Total of Net Profit including FX Gain (Loss)	205	242	159	565	479
Net Profit Margin (including FX Gain (Loss))	40%	41%	28%	37%	28%

ROE

D/E RATIO

EPS



ROE

ROE of 3Q2020 (3M) decreased 71% due to the same reason of the recognition of loss from exchange rate.

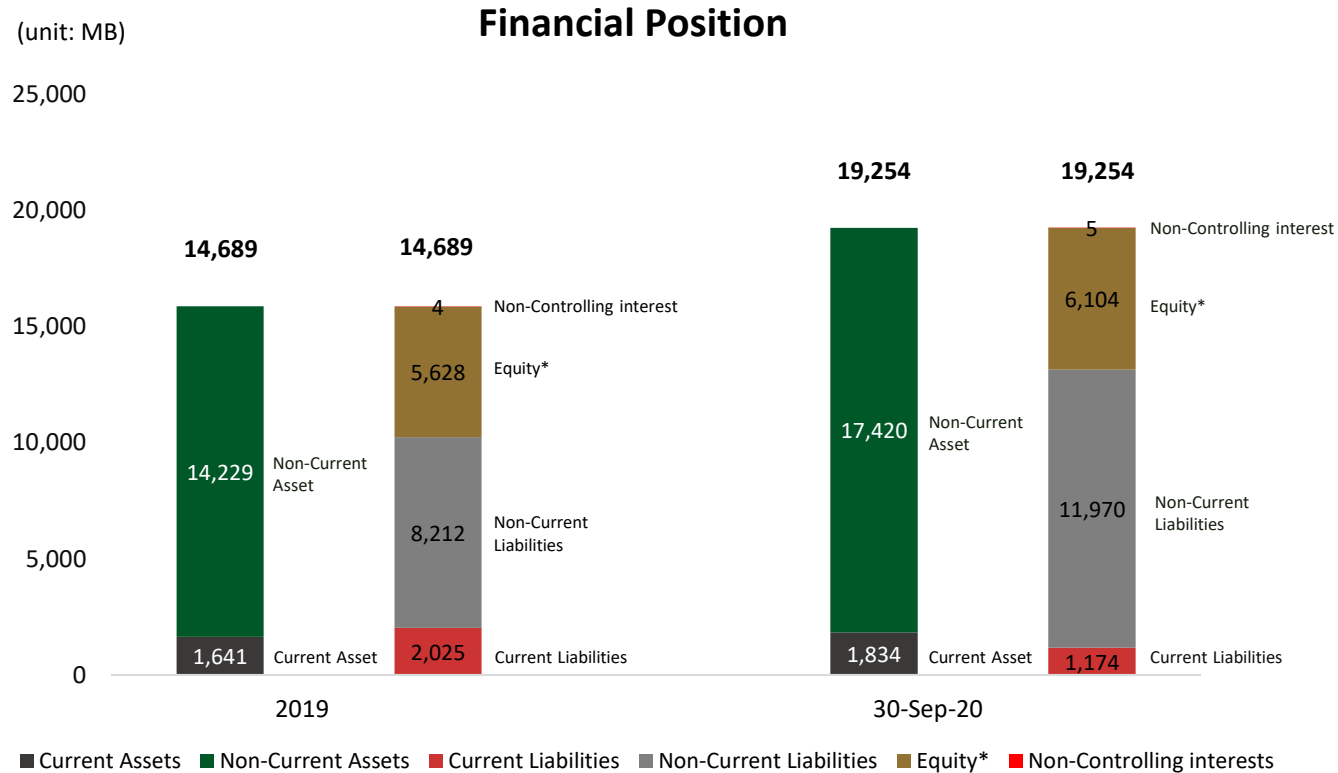
D/E Ratio

D/E ratio of 3Q2020 (3M) increased 6% (YoY) due to the project loan of Onikoube that started construction since 2Q2020; hence, it effected the total liabilities to be increased 34%.

EPS

EPS of 3Q2020 (3M) decreased 73% due to the same reason of the recognition of loss from exchange rate. Therefore, it impacted on Net Profit and Net Profit Margin.

FINANCIAL POSITION 30 SEP 2020



Note: *Equity attributable to owners of the parent

FINANCIAL POSITION	FY2019	3Q2020	+/- (%)
Assets	14,689	19,254	31%
Liabilities	9,775	13,144	34%
Equities*	4,770	6,104	28%
D/E Ratio (times)	2.03	2.15	6%

Due to the business expansion continually, total assets, total liabilities, and equity attributable to owners of the parent as of 30 September 2020 increased respectively. Therefore, it helped generate more revenue.

Total Assets

Increasing from 14,689 MB to 19,254 MB,
or +31%

Total Liabilities

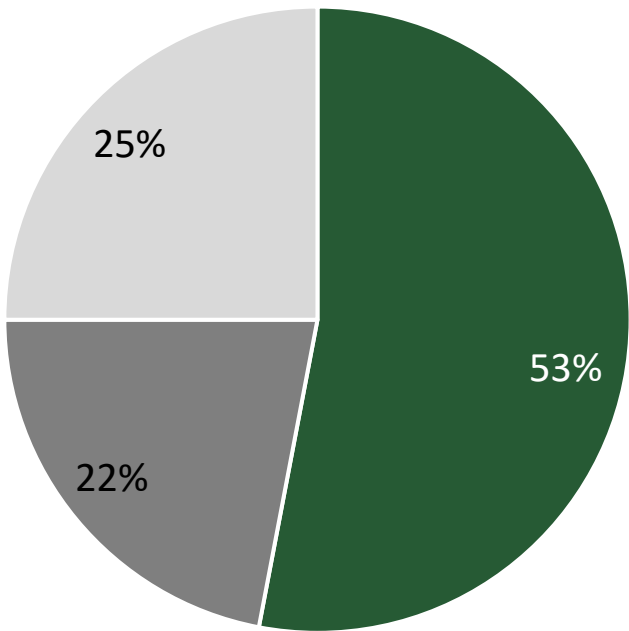
Increasing from 9,775 MB to 13,144 MB,
or +34%

Equity Attributable to owners of the parent

Increasing from 4,770 MB to 6,104 MB,
or +28%

DEBT STRUCTURE 3Q2020

Debt Structure 3Q2020



■ Project Finance Loan ■ Corporate Loan ■ Debenture

Debt Structure 3Q2020

Project Finance Loan	53%
Corporate Loan	22%
Debenture	25%

53%

Most of interest bearing debt from Project Finance Loan for 53%, increased from Onikoube project finance loan drawdown.

47%

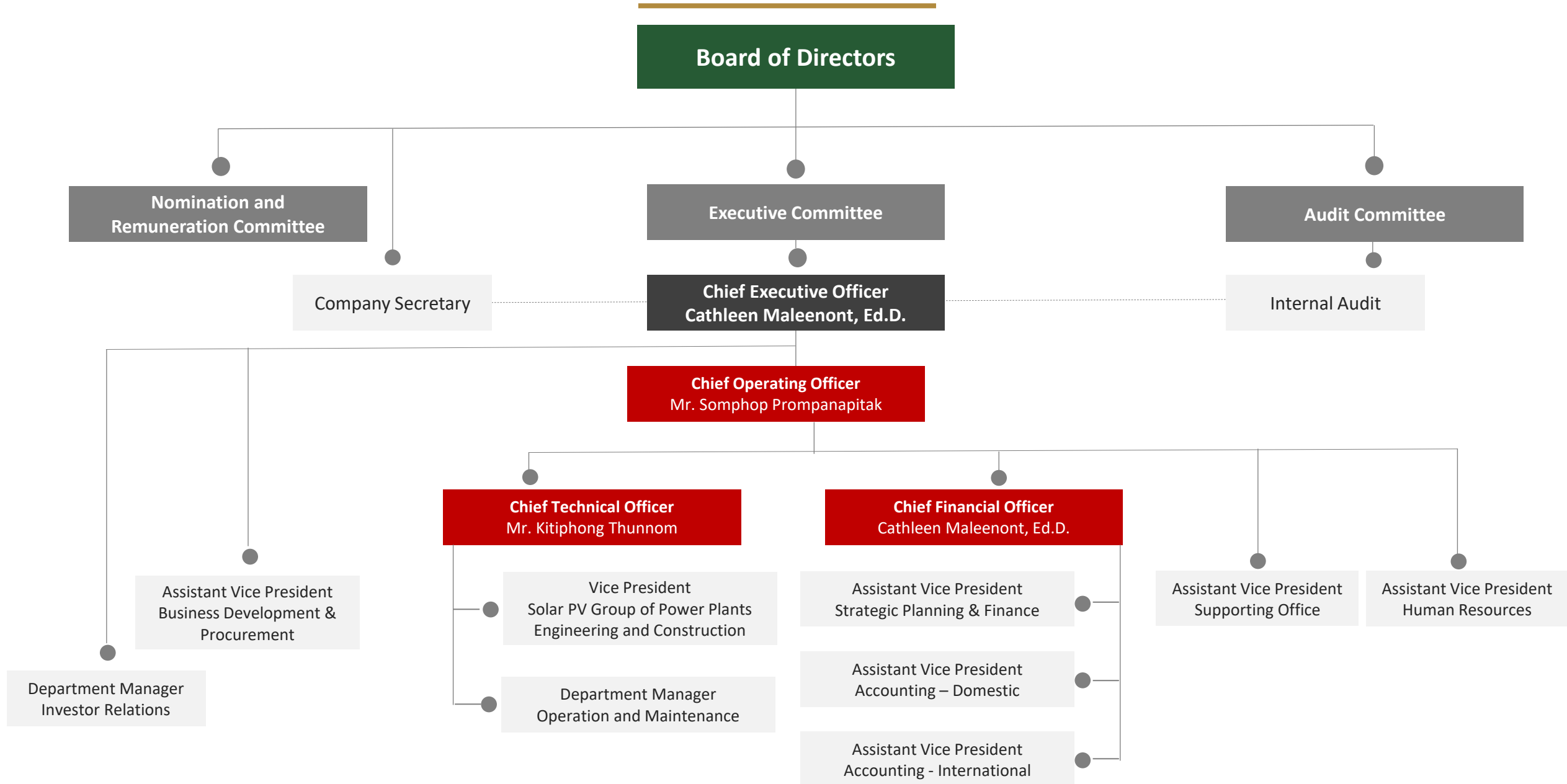
The remaining interest bearing debt from Corporate Loan and Debenture for 47%.

APPENDIX

- Organization Structure
- Board of Directors and Audit Committee
- Investment Structure
- TSE's Projects



ORGANIZATION STRUCTURE



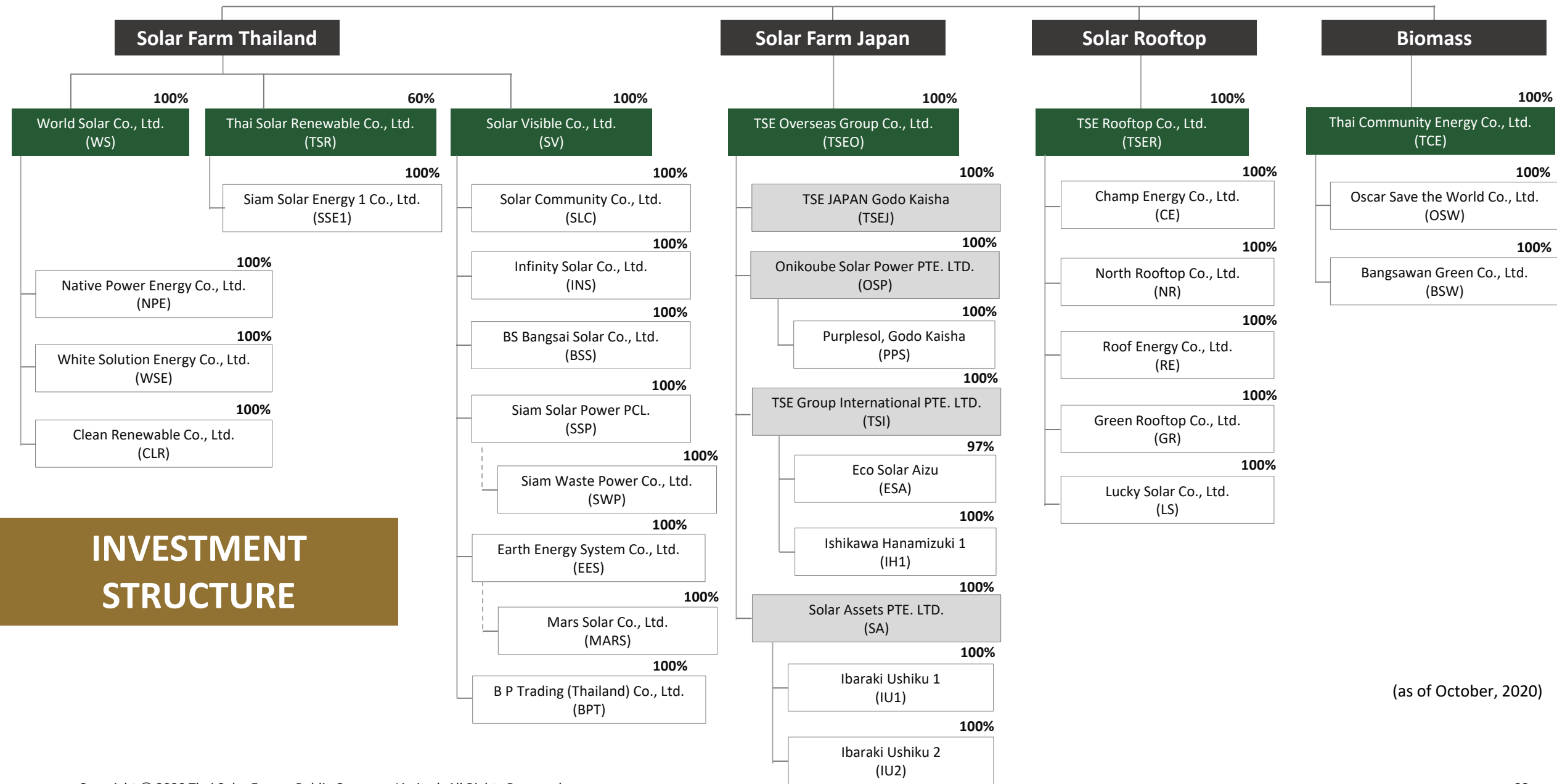
BOARD OF DIRECTORS and AUDIT COMMITTEE

BOARD OF DIRECTORS:

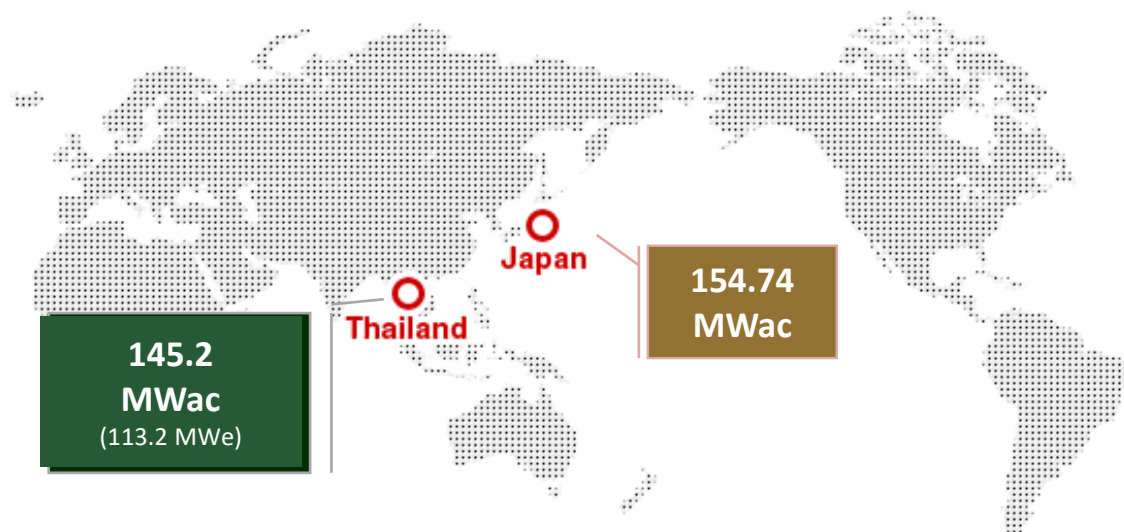
- ❖ Chairman of Board of Directors: **Cathleen Maleenont Ed., D.**
- ❖ Vice Chairman + Independent Director: **Mr. Prommin Lertsuridej**
- ❖ Independent Director: **Mr. Pala Sookawesh**
- ❖ Independent Director +
Chairman of Audit Committee: **Mrs. Siripen Sitasuwan**
- ❖ Independent Director +
Chairman of Nomination and
Remuneration Committee: **Mr. Prasan Chuapanich**
- ❖ Independent Director: **Mr. Aran Apichari**
- ❖ Director: **Mr. Somphop Prompanapitak**
- ❖ Director: **Mrs. Angkanee Rerksirisuk**
- ❖ Director: **Mr. Masthawin Charnvirakul**

AUDIT COMMITTEE:

- ❖ Chairman of Audit Committee + Independent Director: **Mrs. Siripen Sitasuwan**
- ❖ Member of Audit Committee + Independent Director: **Mr. Prasan Chuapanich**
- ❖ Member of Audit Committee and Independent Director: **Mr. Pala Sookawesh**



TSE's Projects



41 Projects (Total 299.94 MWac)

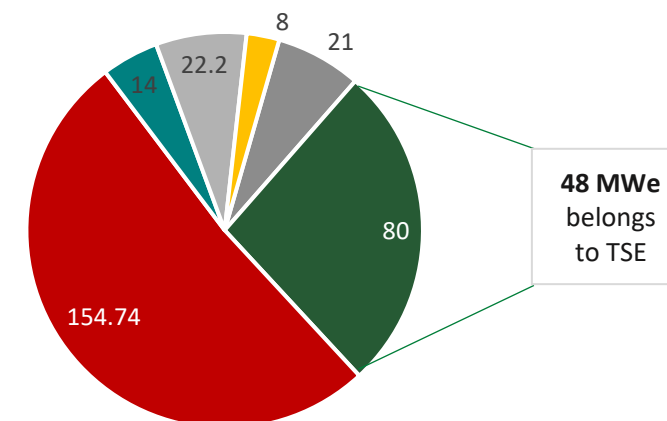
Solar PV Farms
(Total 23 projects)
255.74 MWac (223.74 MWe)*

Biomass
(Total 3 projects)
22.2 MWac

Solar Rooftops
(Total 14 projects)
14 MWac

Floating Solar
(Total 1 project)
8 MWac

TSE's Portfolio (as of OCT 2020)



■ Solar PV Farms - TH ■ Solar PV Farms - TH (JV 60%) ■ Solar PV Farms - JP
■ Solar PV Rooftops ■ Biomass Power Plants ■ Floating Solar Farm*

In Operation

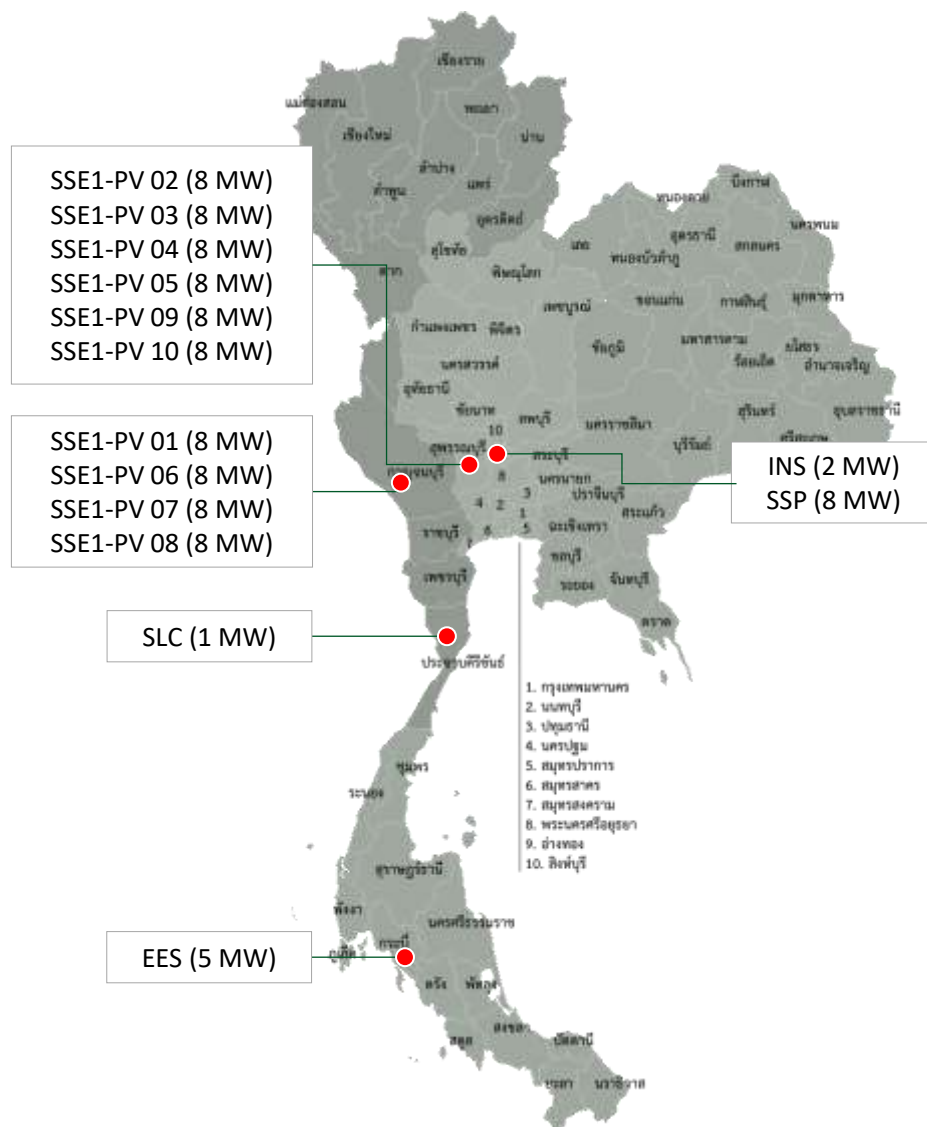
158.94 MWac (126.94 MWe)

Under Construction

141 MWac

(As of October, 2020)

SOLAR PV FARMS (THAILAND)



Project	Selling Capacity (MWac)	Equity Capacity (MWe)	COD	Power Purchase Rate	Tenor
SSE1 PV01 – PV10 *Partnership with GPSC (TSE 60%)	80	48	2013 – 2014	Base Tariff + FT + Adder 6.5 THB/kWh (10 years from COD)	5 years with automatic renewable
SLC	1	1	2016	FiT 5.66 B.	25 years
INS	2	2	2015	FiT 5.66 B.	25 years
BSS	5	5	2016	FiT 4.12 B.	25 years
SSP	8	8	2013	Base Tariff + FT + Adder 8 THB/kWh (10 years from COD)	5 years with automatic renewal
EES	5	5	2018	FiT 4.12 B.	25 years
Total	101	69			

SOLAR PV FARMS (THAILAND)



SSE1-PV01 (8MW)
COD SEP 2013



SSE1-PV02 (8MW)
COD JUL 2013



SSE1-PV03 (8MW)
COD OCT 2013



SSE1-PV04 (8MW)
COD NOV 2013



SSE1-PV05 (8MW)
COD NOV 2013

15
Projects



SSE1-PV06 (8MW)
COD JUN 2014



SSE1-PV07 (8MW)
COD MAR 2014



SSE1-PV08 (8MW)
COD JUN 2014



SSE1-PV09 (8MW)
COD APR 2014



SSE1-PV10 (8MW)
COD MAY 2014

101
MW



SLC (1MW)
COD DEC 2016



INS (2MW)
COD DEC 2015



BSS (5MW)
COD DEC 2016



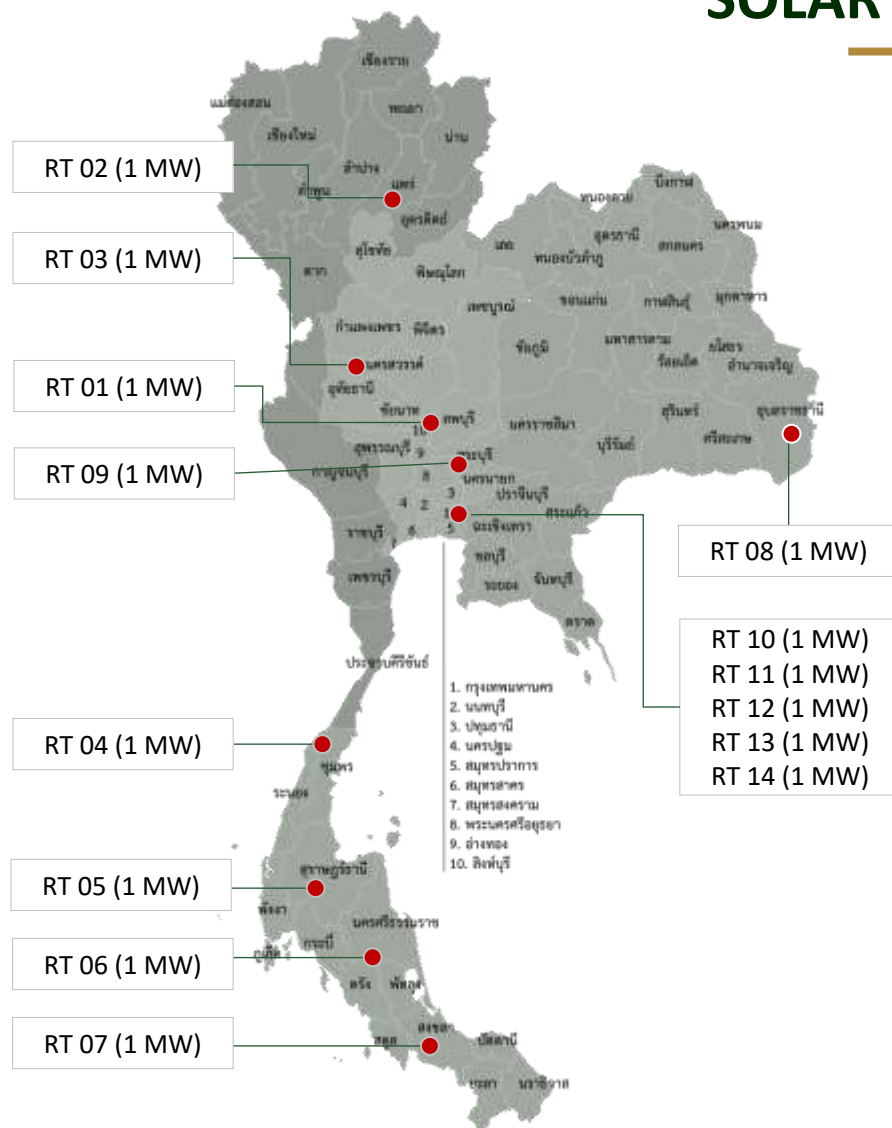
SSP (8MW)
COD MAR 2013



EES (4.3 MW)
COD DEC 2018

Remark:
- As of 30 OCT 2020
- 69 MWe

SOLAR PV ROOFTOPS (THAILAND)



Project	Selling Capacity (MWac)	COD	Power Purchase Rate	Tenor
TSER 01 - 14 *Partnership with The Mall and HomePro	14	2014 – 2015	FiT 6.16 B.	25 years
Total	14			



SOLAR PV ROOFTOPS (THAILAND)



RT-01 Lopburi
COD SEP 2014



RT-02 Phrae
COD FEB 2015



RT-03 Nakorn Sawan
COD JUN 2015



RT-04 Chumporn
COD SEP 2014



RT-05 Surat Thani
COD DEC 2014



RT-06 Nakhon Si Thammarat
COD JUL 2015



RT-07 Hat Yai
COD OCT 2015



RT-08 Ubon Ratchathanee
COD MAR 2015



RT-09 Khao Yai
COD NOV 2014



RT-10 Ekamai-Ramindra
COD FEB 2015



RT-11 Ratchapruet
COD NOV 2014



RT-12 Thapra
COD JUL 2015



RT-13 Bangkok
COD JUL 2015



RT-14 Nangwongwan
COD AUG 2015

14
Projects

14
MW

Remark:
- As of 30 OCT 2020

BIOMASS (THAILAND)

Project	Selling Capacity (MWac)	COD	Power Purchase Rate	Tenor
BSW	4.6	2018	FiT 4.24 Baht + Premium 0.30 THB (8 years)	20 years
OSW 1	8.8	2018		15Y4M
OSW 2	8.8	2018		
Total	22.2			



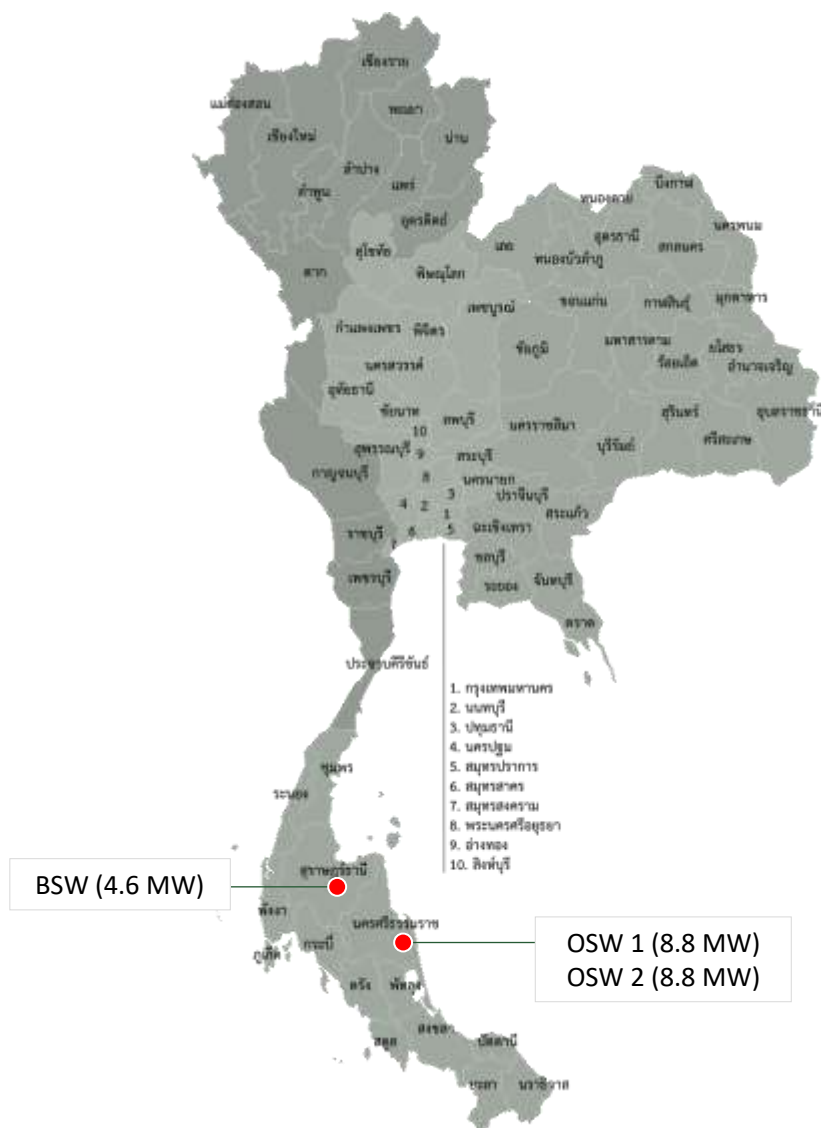
BSW (4.6 MW)



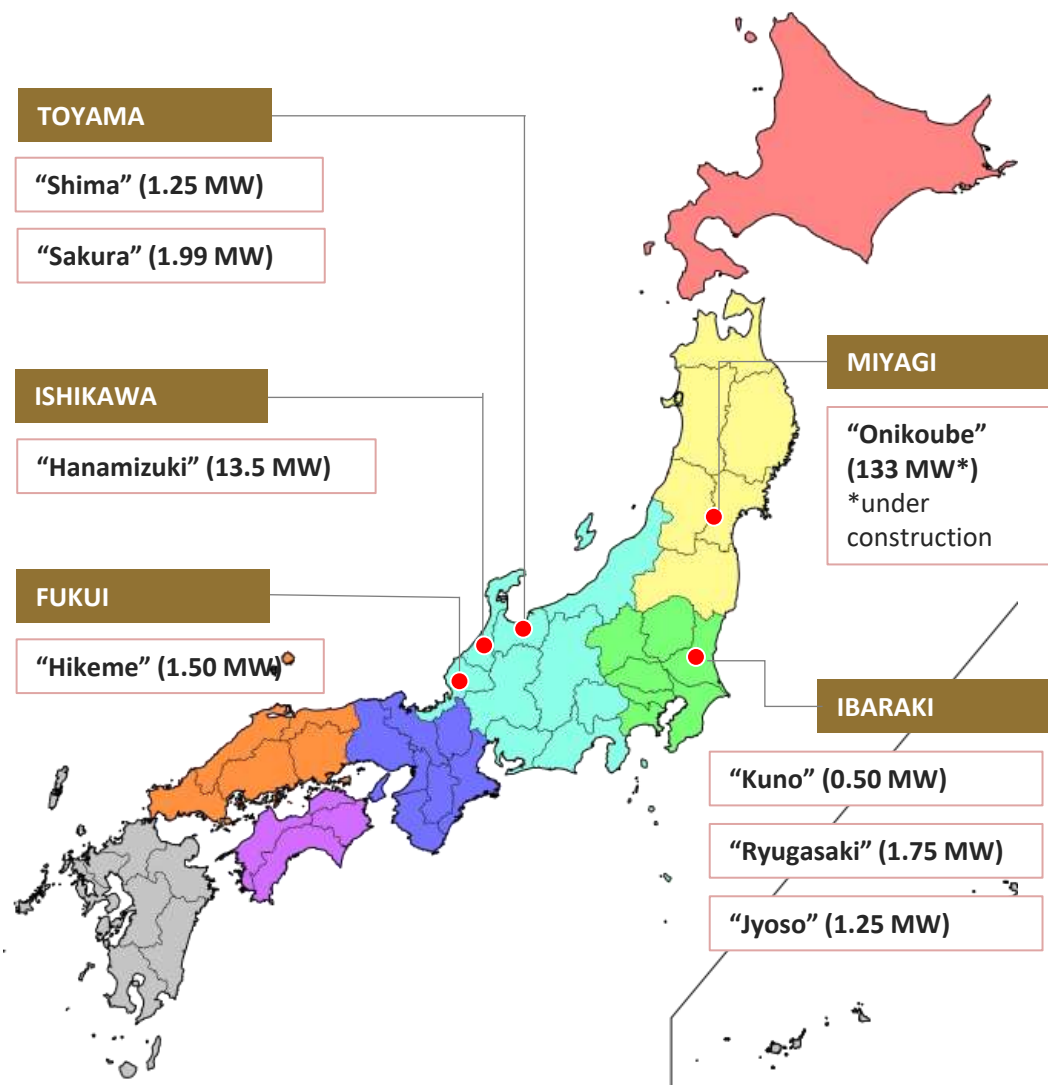
OSW 1
(8.8 MW)



OSW 2
(8.8 MW)



SOLAR PV FARMS (JAPAN)



Project	Location	Installed Capacity (MW)	Selling Capacity (MWac)	COD	Feed-in-Tariff (JP¥)
Kuno	Ibaraki	0.65	0.50	31/8/2015	36
Shima	Toyama	1.43	1.25	2/3/2016	32
Hikeme	Fukui	1.86	1.50	1/4/2016	32
Ryugasaki	Ibaraki	2.36	1.75	1/9/2016	36
Sakura	Toyama	2.55	1.99	2/11/2017	32
Jyoso	Ibaraki	1.59	1.25	2/5/2018	36
Hanamizuki	Ishikawa	18.1	13.50	2/1/2019	36
Onikoube	Miyagi	147.00*	133.00*	4Q2022	36
Total		175.54	154.74		

SOLAR PV FARMS (JAPAN)



Kuno (0.5 MW)
COD AUG 2015



Shima (1.25 MW)
COD MAR 2016



Hikeme (1.50 MW)
COD APR 2016



Hanamizuki (13.5 MW)
COD JAN 2019



Ryugazaki (1.75 MW)
COD SEP 2016



Sakura (1.99 MW)
COD NOV 2017



Jyoso (1.25 MW)
COD MAY 2018



Onikoube (133 MW)*
SCOD 4Q2022

(*under construction)



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THANK YOU

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