

# Introduction of SION Small Hydropower Project

*10MW Small Hydropower Plant in North Sumatra by PT. Citra Multi Energi*

Seminar on the JCM Implementation in Indonesia  
October 21<sup>st</sup>, 2019

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Takashi Kanazawa  
**TOYO ENERGY FARM CO., LTD**

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# Preface — *Objective of the Project*

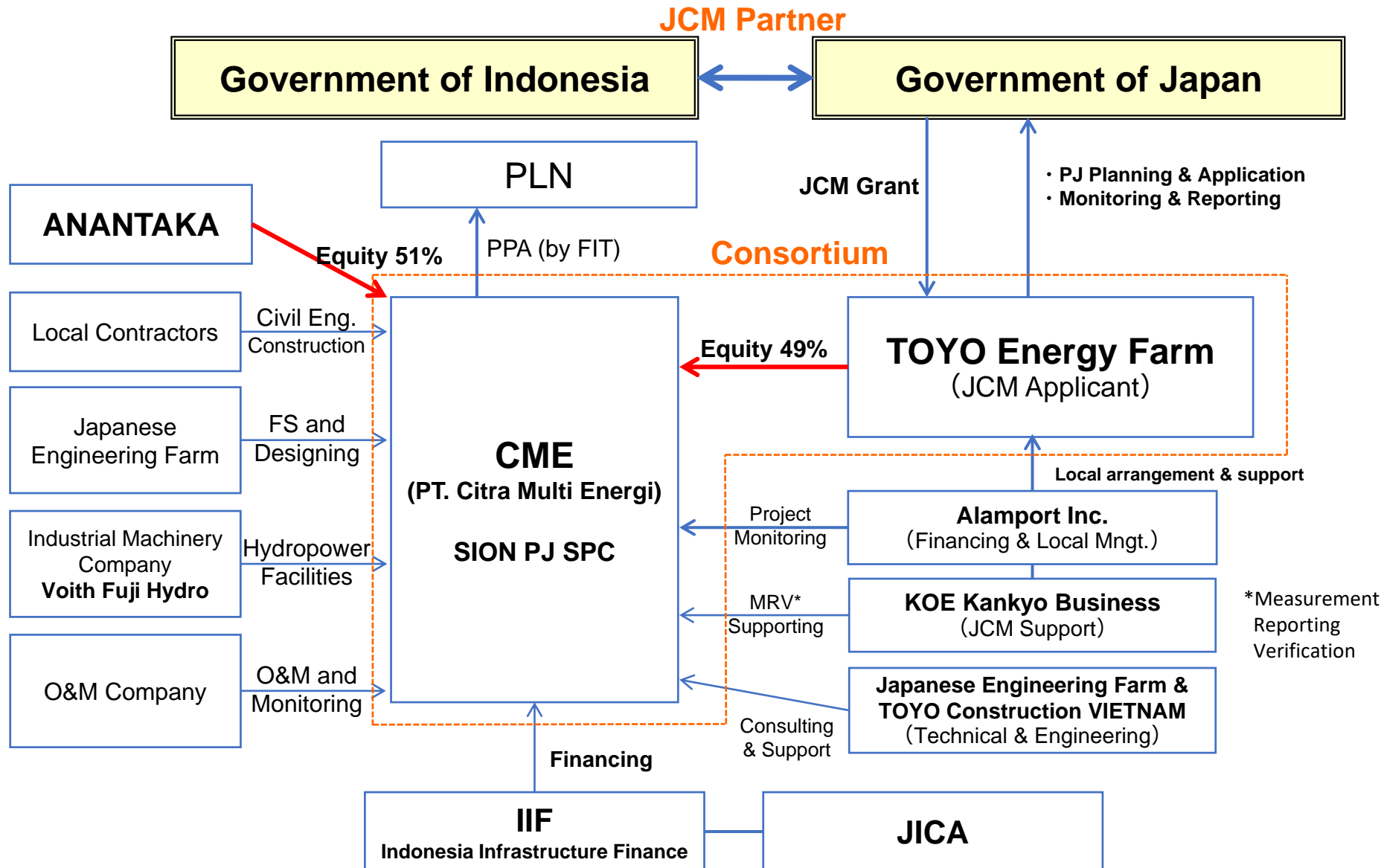
- Imbalance between electricity supply & demand in North Sumatra
- Potentiality of small hydropower in substitution for conventional energy sources as well as a key factor for developing low-carbon society
- Challenges to tackle on hurdles and issues of developing this kind of renewable energy project.  
(esp. financing at an early stage and O&M)



Simonggo River at site

*Our ultimate goal is to contribute to the establishment of sustainable, low-carbon society through the diffusion of Japanese new and innovative technologies*

# Project Scheme



# About TOYO Group

## Toyō Group will

demonstrate the synergy effects of our various businesses, by a one-stop business scheme.

expand our business fields based upon

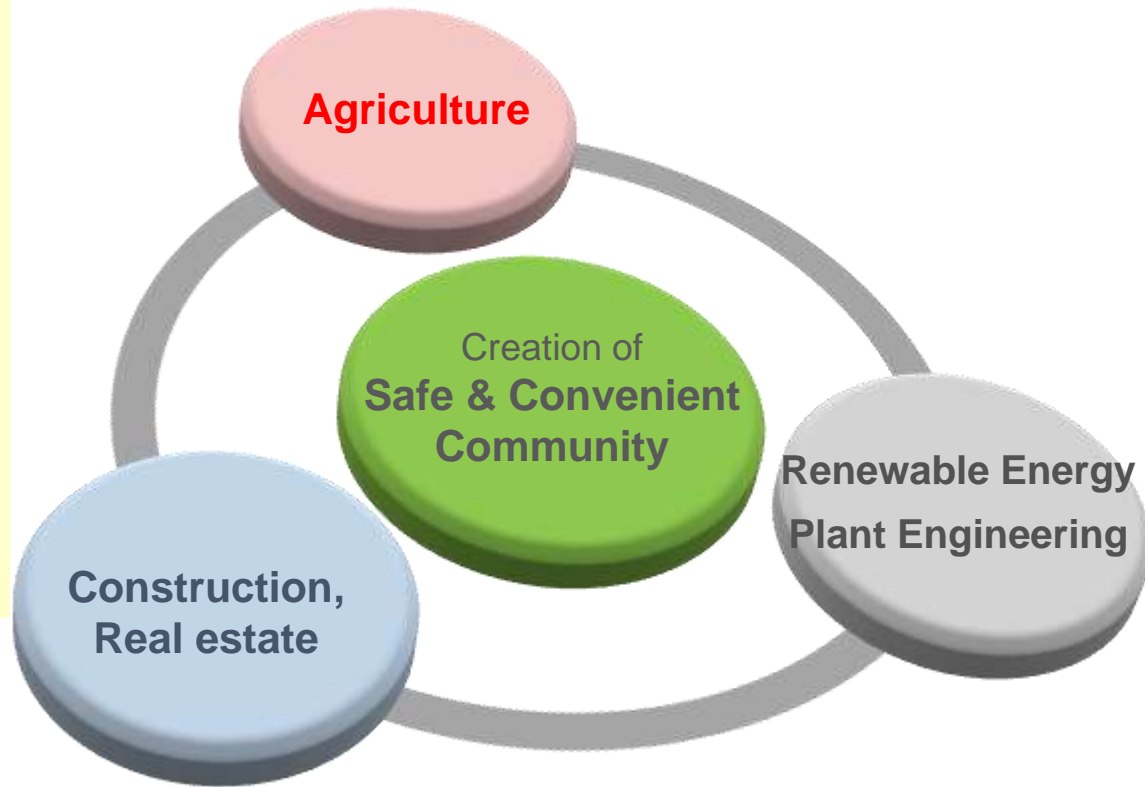
**General Construction &  
Real Estate Businesses**

realize an earth-friendly society using

**Renewable Energy...**

provide trusted, safe and tasty

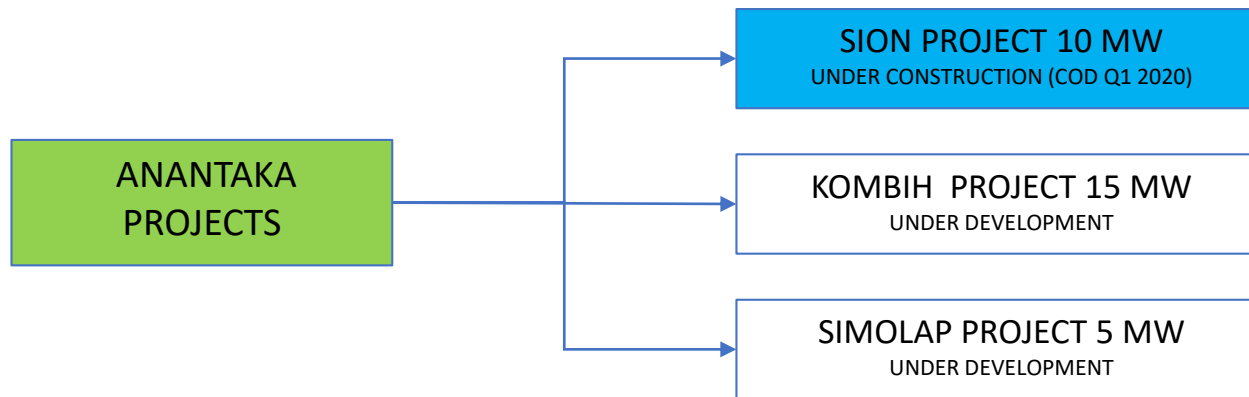
**Agricultural Products...**



**Our Goal is to realize a community where everyone can benefit from safe, convenient and green environment.**

# About ANANTAKA Group

- PT ANANTAKA HIDRO INDONESIA (ANANTAKA), was incorporated in Oct 2014 with the objective of developing Green Energy in Indonesia.
- Targets to develop several projects in Indonesia with total capacity of 100 MW.
- ANANTAKA projects under development:



## ANANTAKA project philosophy :

- Develop Green project that contribute multiple effects to the surrounding society
- Max energy production efficiency
- Min maintenance requirements
- Structurally able to withstand natural mishap
- Project is designed and constructed in compliance with international environmental standards

# Renewable Energy & Plant Engineering Business

Mega-solar Power Plant



Small Hydropower Generation



## Renewable Energy Business Plant Engineering Business

Methane Fermentation Biomass Power Plant



Wood Biomass Power Plant





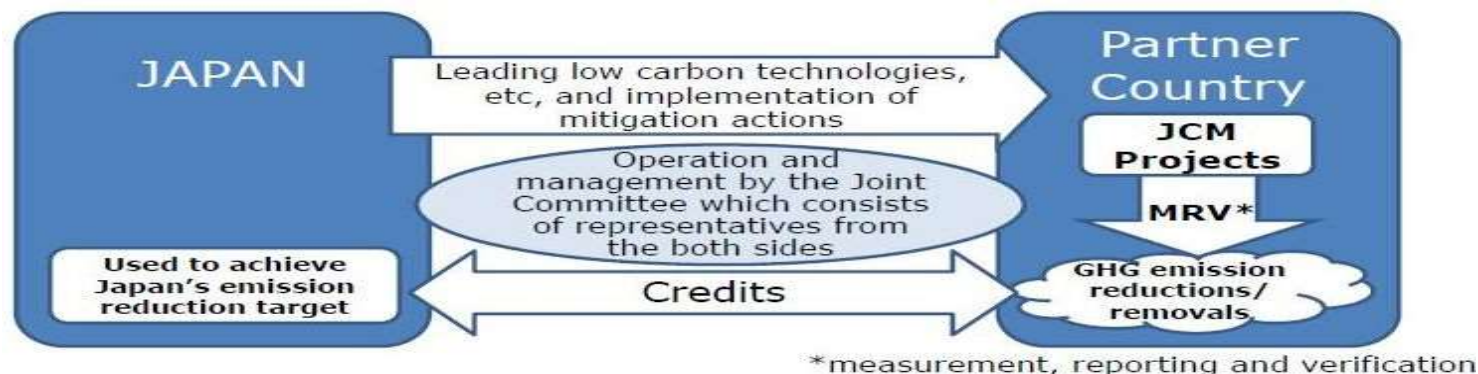
# SION Small Hydropower Project — *Site Location*





# SION Small Hydropower Project — JCM and Outline

The SION small hydropower project was adopted as the “JCM Model Project 2016” under the supervision by Ministry of Environment of Japan.



Project Name & Location	<b>10MW Small Hydropower Generation Project in North Sumatra</b> HumbangHasundutan, North Sumatra, Indonesia
Power Plant Type	Run of river, Small Hydropower Plant (@Simonggo River)
Representative entity	Toyo Energy Farm Co., Ltd.
Local partner	PT. Citra Multi Energi
Power generating Capacity	10MW (5MW×2)
Estimated Power generation	68.78GWh / Year
Completion	January, 2020
Amount of CO2 reduction	47,182 tons / Year

# SION Small Hydropower Project — *Hydropower Equipment*

Small hydropower generating equipment used in this project is manufactured by Voith Hydro India, which is an affiliate company of Voith Fuji Hydro, Japan.

## Specifications

Generator Type : Horizontal Shaft Francis Turbine and Generator

ITEM	VALUE
Head (Ht)	72.60 m
Hydropower Generation (Pt)	6,050 kW
Rotate Speed (N)	500min <sup>-1</sup>
Generator Power (Pg)	7,176kVA
Frequency (Hz)	50Hz
Power Factor (Pf)	0.85 / 1.0
Rated Voltage (Vg)	6.3kV



# SION Small Hydropower Project — GRP Pipes

- **Glassfiber Reinforced Polyester (GRP) Pipes** are used for the movement of water.
- GRP pipes utilized in SION PJ are manufactured by SUBOR, Turkish company.
- Fundamental choices between open-cut channel or installing GRP pipes?

## Specifications\*

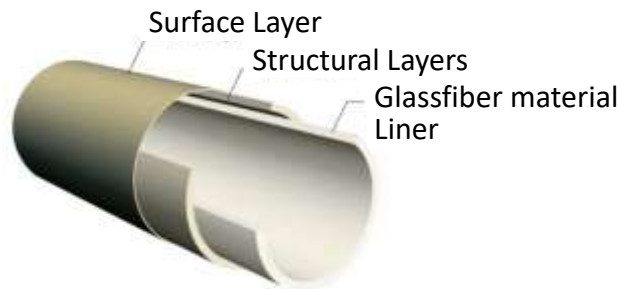
Length: 12 m. (Standard) /

0.3- 15 m. (On demand) [6 m](#)

Diameter (DN): 250 – 4,000 mm [3,000mm](#)

Rigidity (SN): 2,500 - 5,000 - 10,000 N/m<sup>2</sup>

Pressure (PN) 1 - 32 Atm.



\*Referenced from SUBOR corporate website <http://www.subor.com.tr/en>



# Construction Progress

Powerhouse Area



GRP Pipe Installation



Weir Area



# Challenges in implementing the Project

## 1. Preliminary Survey/Feasibility Study

- Had to be carefully conducted esp. from environmental and technical aspects

## 2. Cultural and Language Barriers

- Need to understand cultural differences especially in communication and decision making process
- Critical to have site controller(s) who can translate “What should be done & Why” to construction workers

## 3. Conformity with Local Community

- Reminding the fact that we are “OUTSIDERS”
- Be aware and admire the life of local community

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**TERIMA KASIH !**

**Thank you for your kind attention.**

(Exhibits to follow.)



### Managing the Group Companies

- **TOYO HOLDINGS Co., Ltd.**

### Real Estate ・ Construction Business

- **TOYO CONSTRUCTION Co.,Ltd.**
- **OKADA REAL-ESTATE Co.,Ltd.**
- **TOYO RENEWAL Co.,Ltd.**

### Energy ・ Plant Engineering

- **TOYO ENERGY FARM Co.,Ltd.**
- **TOYO ENERGY SOLUTION Co.,Ltd.**
- **TOYO YABU BIO ENERGY Co.,Ltd.**

### Agriculture Business

- **TOYO YABU AGRICULTURAL PRODUCTION Co.,Ltd.**
- **HOKKAIDO AGRI MART Co.,Ltd.**

■ Company name	TOYO HOLDINGS Co.,Ltd.
■ Representative Director	Yoshimitsu Okada
■ Location	11th Yurakucho Building 1-10-1 Yurakucho, Chiyoda-ku, Tokyo
■ Contact	TEL +81-(0)3-4400-6104      FAX +81-(0)3-3286-8700
■ Established	September 28 <sup>th</sup> , 2005
■ Equity	¥ 10,000,000
■ Business Overview	Managing the Group Companies and additional related businesses.
■ Employee	40 people

## Company Overview - 2

■ Company name	TOYO CONSTRUCTION Co., Ltd.		
■ Representative Director	Yoshimitsu Okada		
■ Location	【Main office】	7-1-11 Shibamata, Katsushika-ku, Tokyo	
	【Yurakucho office】	1-10-1 11F Yurakucho, Chiyoda-ku, Tokyo	
	【Koiwa office】	1-26-11 Nishikoiwa, Edogawa-ku, Tokyo	
	【Saitama office】	1-10-18 Takasago, Urawa-ku, Saitama	
	【Fukushima office】	1-2-3 Nakamura, Souma-shi, Fukushima	
	【Yabu office】	1153-3 Oyabu, Yabu-shi, Hyogo	
	【Mito office】	2-1-26 Daikucho, Mito-shi, Ibaraki	
	【Noda office】	524-8 Noda, Noda-shi, Chiba	
	【Shinkoiwa office】	1-52-10 Shinkoiwa, Katsushika-ku, Tokyo	
	【Gunma office】	2523-5 Kamishiroi, Shibukawa-shi, Gunma	
	【Tateishi display housing area】	2-16-7 Tateishi, Katsushika-ku, Tokyo	
■ Contact	TEL +81-(0)3-5694-1321	FAX +81-(0)3-5694-2324	
■ Established	November 10, 1971		
■ Equity	¥ 480,000,000		
■ License Number	Specific construction industry / Demolition industry Minister of Land, Infrastructure and Transport (Special-28) No. 17297 First class architect office Tokyo Governor Register No. 43467 Residential Building trading business Minister of Land, Infrastructure and Transport (4) No. 6834		
■ Business Overview	Construction and design supervision Building・Mansion・Apartment・Office Building・Store・Shrines and temples・Shopping centers・Personal housings・Elderly welfare facilities・Social welfare facilities・Medical facilities etc. Real estate sales, brokerage business・Development of residential areas・Sales of residential buildings		
■ Employees	130people		

## Company Overview - 3

■ Company Name	TOYO ENERGY FARM Co., Ltd.	
■ Representative Director	Yoshimitsu Okada	
■ Location	【Main Office】	1-2-3 Nakamura, Souma-shi, Fukushima
	【Sales Office】	7-1-11 Shibamata, Katsushika-ku, Tokyo
	【Yurakucho Office】	1-10-1 11F Yurakucho, Chiyoda-ku, Tokyo
	【Mito branch】	2-1-26 Daikuchu, Mito-shi, Ibaraki
	【Hanyu branch】	1466 Honkawamata, Hanyu-shi, Saitama
	【Yabu branch】	1153-3 Oyabu, Yabu-shi, Hyogo
■ Contact	TEL +81-(0)3-5622-5707	FAX +81-(0)3-3673-3511
■ Established	August 13, 2012	
■ Capital	¥480,000,000	
■ Business Overview	<p>Generating Mega solar power, Small hydro power, Wood biomass power, Bio-methane gas, Wood biogas power. Manufacture and sales of biomass and incinerator business.</p> <p>Various EPC, retail electricity, waste heat utilization business</p> <p>Hydroponic cultivation farm management, vegetable processing business (cut vegetable factory, juice processing factory)</p> <p>Functional vegetable development project, high sugar content tomato farm management, consolidation of agricultural industry</p> <p>Tsukuba Collaborative Research (Optimized production system by IOT using AI)</p> <p>Natural energy business development support, hydroponic cultivation farm management support, employment support for the elderly / disabled person</p>	
■ Employee	25 people	

## SION PROJECT 10 MW



Site Survey at Simonggo River



Socialisation of Land Acquisition



Ground Breaking Ceremony



Soil Excavation at Water Way Area



Access to HEPP SION Location



Independence Day Celebration



Soil Excavation at Power House



Spoil Bank Area

## ANANTAKA Projects - 2

### KOMBIH PROJECT 15 MW



Weir Location



Socialisation Programme



Rainfall Daily Monitoring



Water Level Daily Monitoring

### SIMOLAP PROJECT 5 MW



Weir Location HEPP Simolap



Waterfall at the location of HEPP Simolap