

Dec. 18, 2018

CHODAI

Indonesia-Japan Collaboration Seminar toward ASEAN
Smart Cities Network



Regional development solution utilizing IT technology and
Japanese management techniques through cooperation
between Japanese and Asian companies



History of Chodai Group

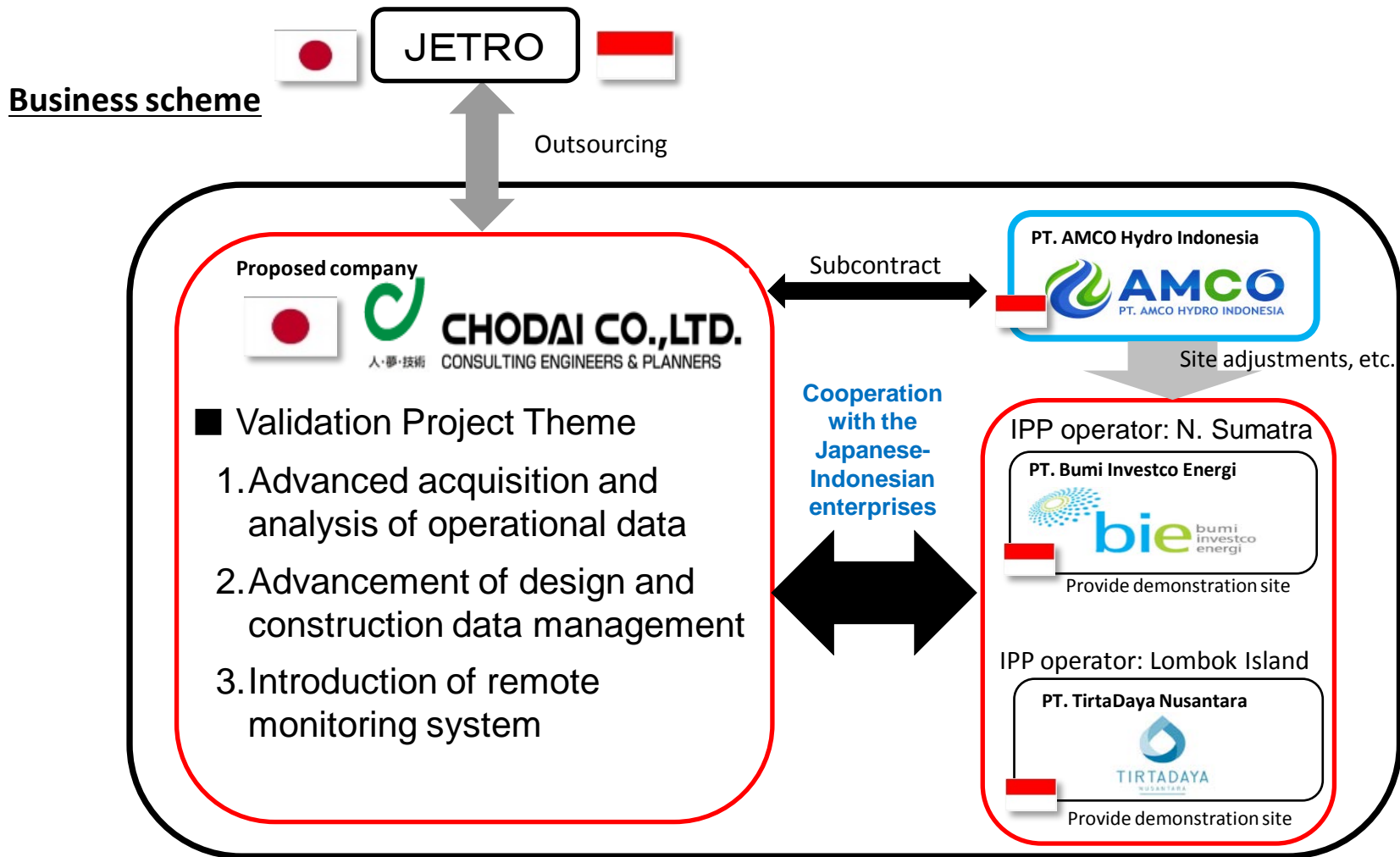
- ✓ Incorporated in 1968, This is 50th anniversary
- ✓ Involved Long span Bridge Projects all over the world
- ✓ Business Expansion to the field of consulting for Road, Environment, ITS (Intelligent transport system), PPP, Railway etc.
- ✓ Set-up Rep. Offices in Seoul, Beijing, Viet-Nam, Papua New Guinea and Turkey



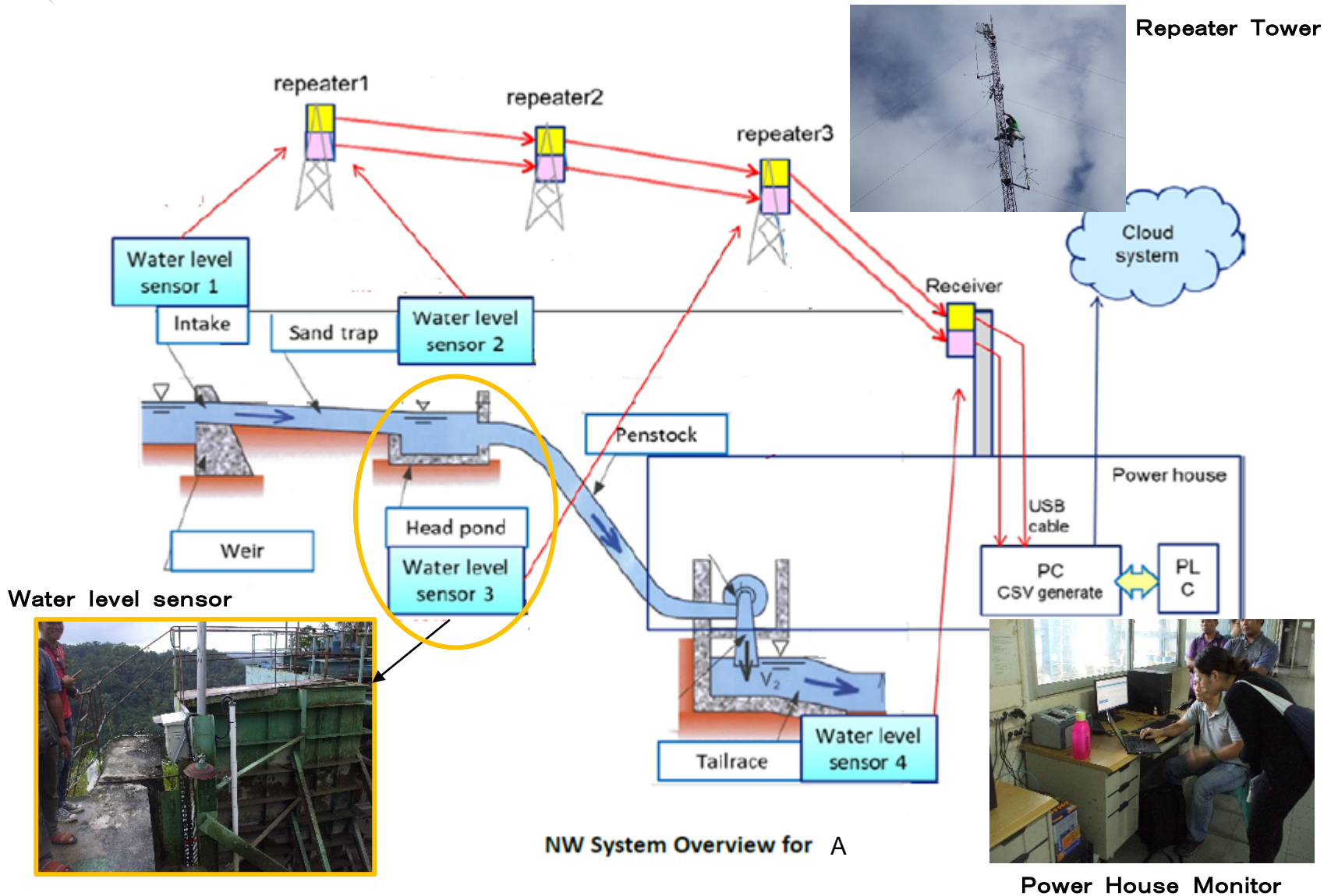
- ✓ Development of Business Promotion Strategy in 2009
- ✓ Involved in Hydropower Business in Philippines in 2011
- ✓ [Involved in Hydropower Business in Indonesia in 2013](#)
- ✓ [Incorporated AMCO, SPC for Asset Management in 2016](#)
- ✓ Listed in the 1st Section of Tokyo Stock Exchange in 2017
- ✓ 1,450 employees and 26B JPY sales in 2017



Implementation system of this project



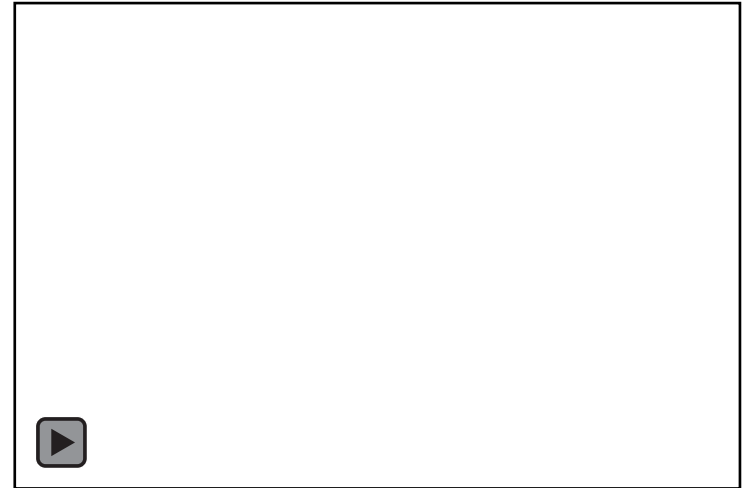
Theme A: Advanced acquisition and analysis of operational data



Theme B: Advancement of design and construction data management

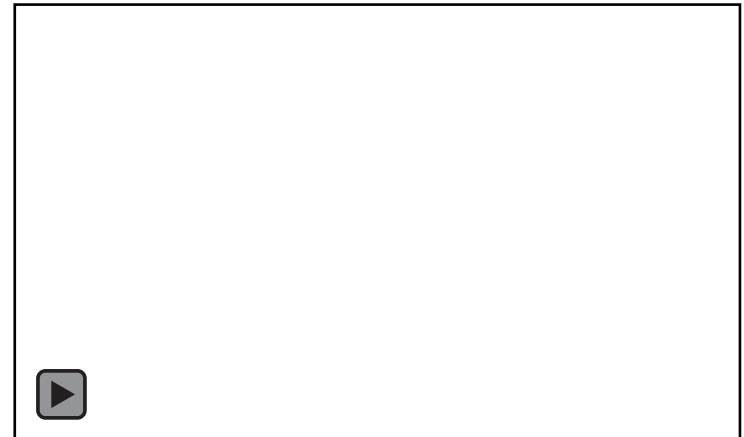
■ Optimum power generation layout plan assumed F/S stage

- ✓ 3D CAD topographic map creation (hereafter referred to as "3D model")
- ✓ Review of optimal power generation layout plan (intake facility, head pound, power station)
- ✓ Selection of headrace normal/optimum plan by 3D model (comparison of 3 route plans)



■ Detailed design by 3D model

- ✓ Creation of 3D detailed design drawing based on optimal power generation layout plan
- ✓ Target is head pound, power plant

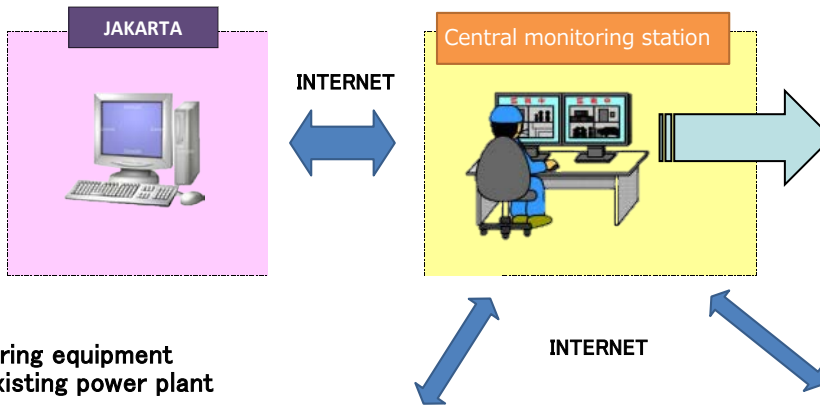


■ Results of validation project

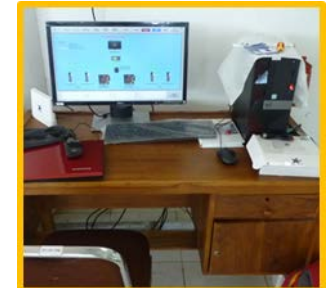
Confirmed speed and efficiency optimum power generation arrangement plan by 3D model and template creation/use based on drone survey topographic map. We conducted a detailed design by 3D model and confirmed the rationalization of design, modification etc.

Theme C: Introduction of remote monitoring system

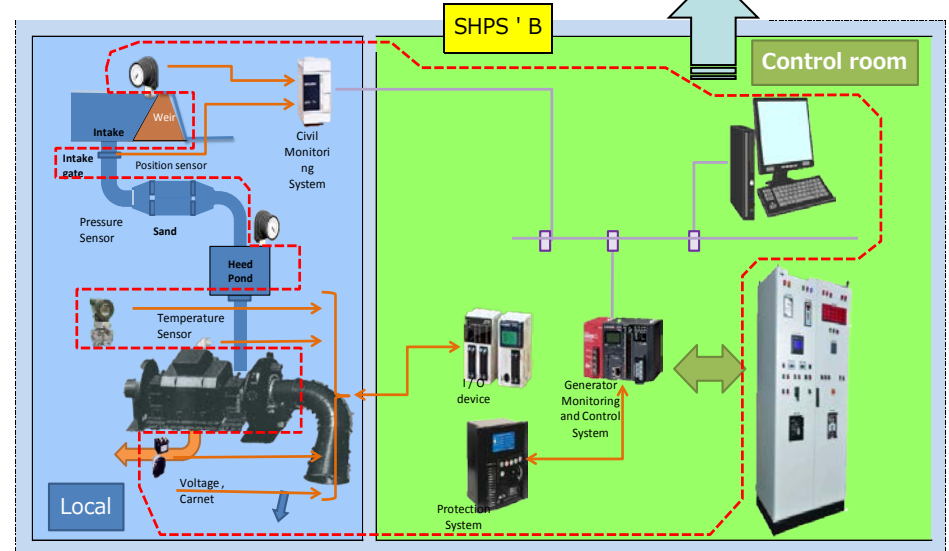
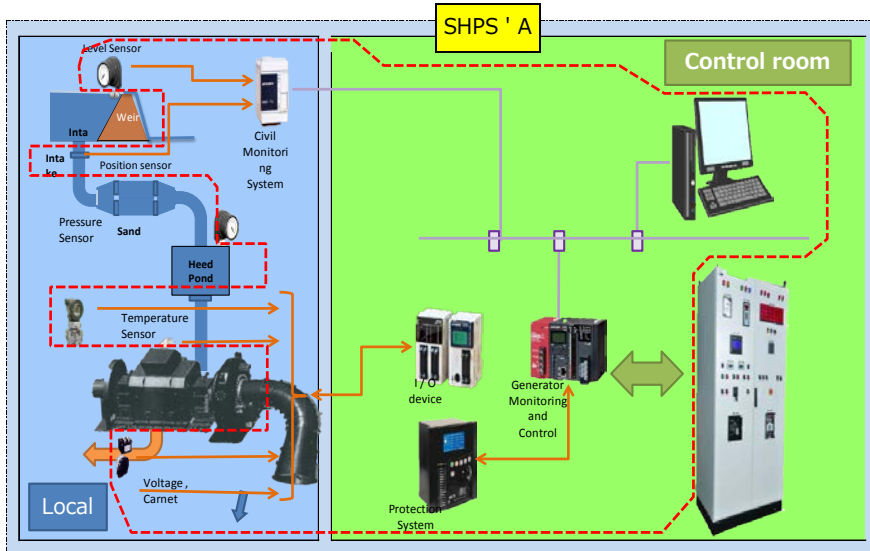
Review the concept of remote monitoring system and introduce demonstration system to 2 sites



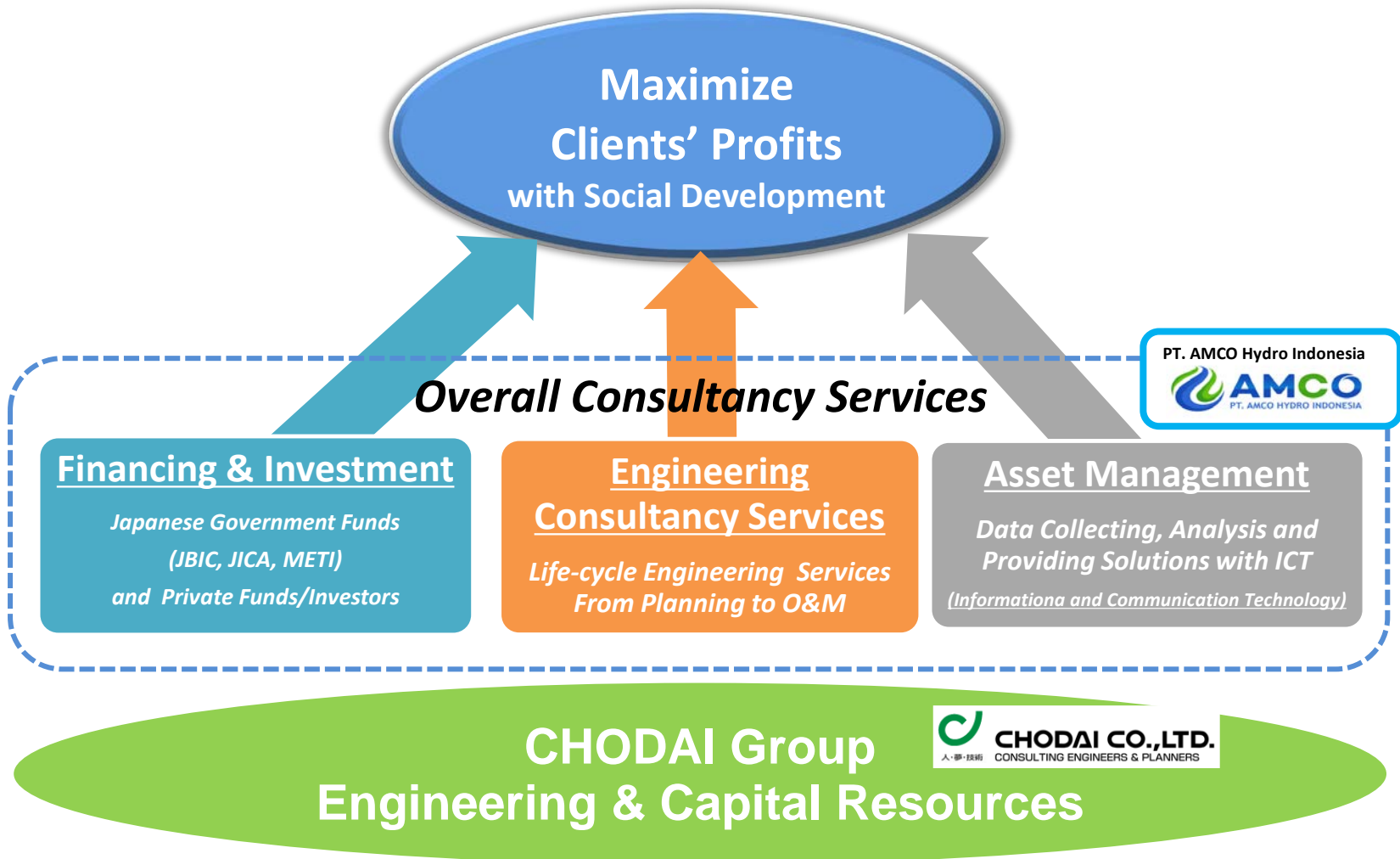
We confirmed that the demonstration system operates as specified.



Install remote monitoring equipment at existing power plant



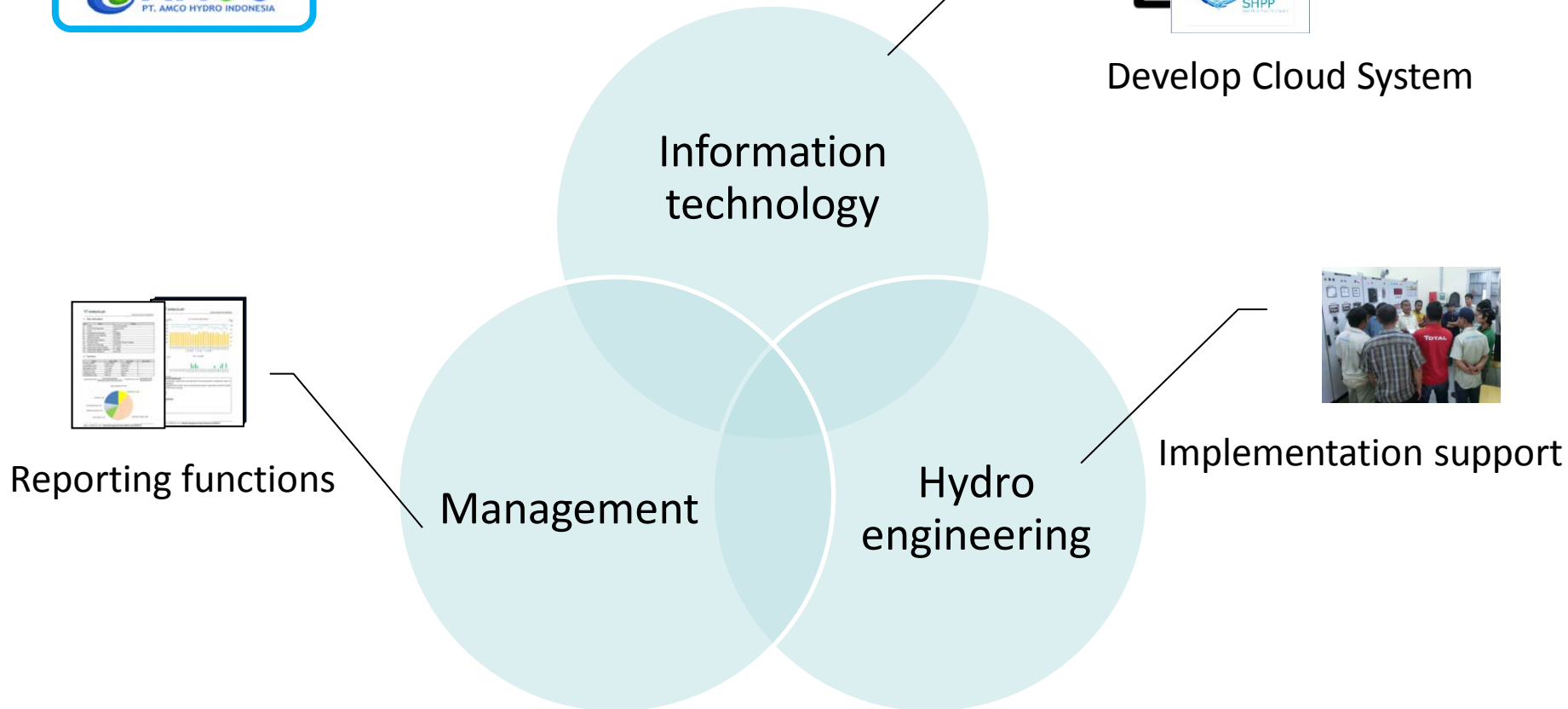
Consultancy Services in Hydro Power Business



AMCO(Asset Management Company) Service Concept

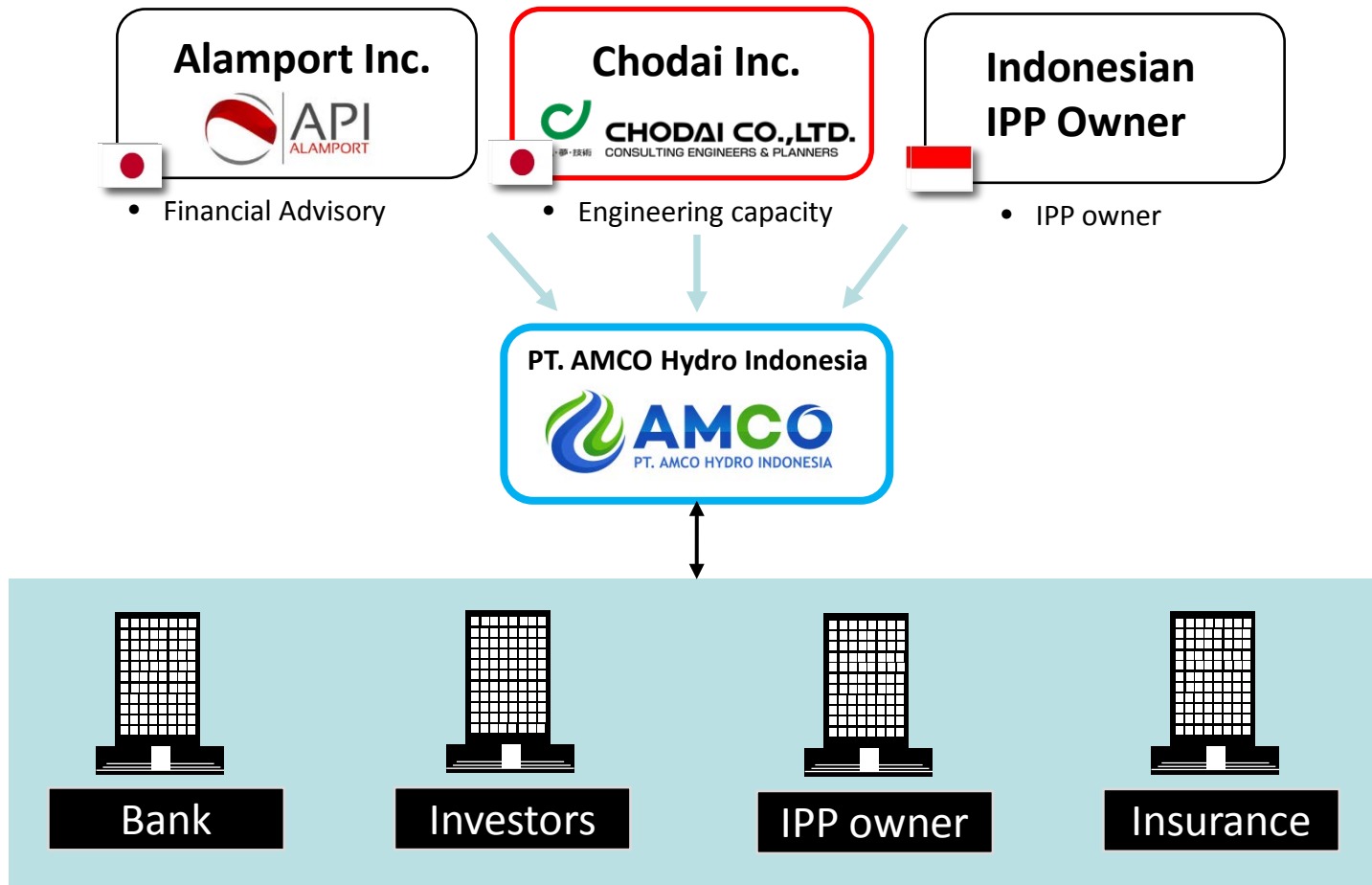


Develop Cloud System



- ✓ Creating cycle of “**Visualize**” => “**Analyse**” => “**Improve**” is important
- ✓ Up-grade hydro power plant in Indonesia in terms of **reliability** and **efficiency** by using **information technology** and **Japanese management way**

AMCO's formation and intention



- ✓ AMCO provides solutions for various stakeholders to make Indonesian hydro projects moving forward

Ongoing PPP Projects in Caraga Region, Mindanao, Phil

[UNECE* choose this as one of the 10 Best PPP Practices in the world]

* UNECC : United Nations Economic Commission for Europe

★ Equity investment implemented
★ Consultancy/planning
(light-colored marks indicate "under consideration/negotiation")
[As of Feb 2018]

- F/S funded by JICA.
- Revitalization of abandoned ponds by using soil/water improvement product provided by Japanese company.



- JAS (Japan Agricultural Standard) accredited.
- the processing factory to be operated in 2016. (Japanese equipment)

Prawn Farming Pilot Project

Rice Farming Project

- Doubled the average yield by using soil/water improvement product provided by Japanese company. (to 7~8t/ha from 3.7t/ha)
- Farming of high-valued Japonica Rice



Biomass Energy Project

- F/S funded by METI (2015, 2017)
- Developing a model of sustainable supply system of rice husks and power generation (2MW).
- Supported as JCM Project by MOE

Wind Power Generation Project

- F/S funded by METI (2016, 2017)

Solar Power Generation Project

Initial Study (200MW)

Development of a Low Carbon Industrial Park Project (141 ha)

- A milling factory was built on May 2015
- To be produced 20,000 ton/year in the rice mill
- 140 ha
- PEZA accredited
- F/S funded by METI (FY2016)



Ricemill Plant



Rice Mill

Eel Farming Project

Asiga River Hydro Power Project

- 8MW
- To be operated in FY2016
- Installed power generation equipment by Voith Fuji Hydro.
- Two-step loan by JBIC provided.



[JCM] Taguibo River Hydro Power Project

- 4MW (To be operated in FY2019)
- F/S funded by JBIC (2015)
- Supported as JCM Project by MOE (FY2017)

Wawa River Hydro Power Project

- 10MW (Under review)
- To be operated around FY2020
- F/S funded by METI (2012)
- F/S funded by JICA (2014~2016)

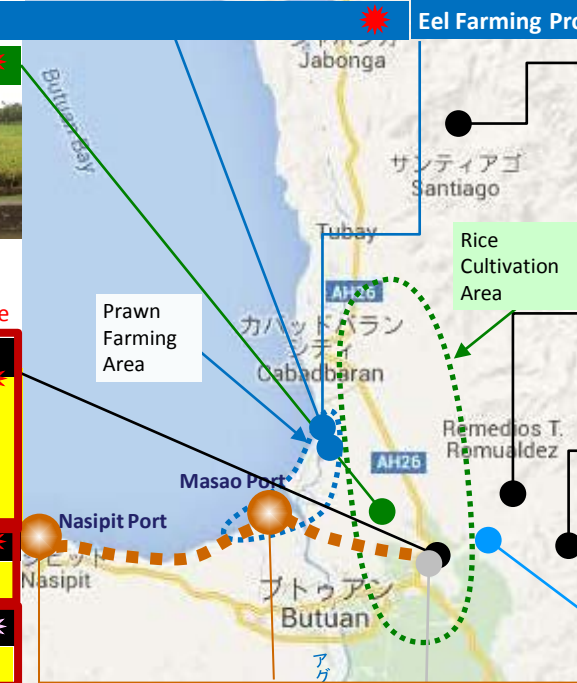
Bulk Water (Water Supply) Project

- 30,000m³/day (80,000m³/day in future)
- Term: FY2015~2040 (+25 years)
- Two-step loan by JICA provided.
- Pipes manufactured by Kurimoto.



Infrastructure Basic Survey

- Pre-F/S funded by OCAJI (2015)
- Proposing for expansion of logistics infrastructure



Thank you for your attention!!



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