Thematic Meeting 2 : Approaches towards energy saving/low carbon urban development

Venue：Aegean, 3F, InterContinental Yokohama Grand
Moderator：Prof. Fumihiko Nakamura, Vice President, Yokohama National University
Conference Secretariat/Rapporteur：Ms. Masami Tadokoro, Senior Researcher, OECC
Language：English/Japanese (simultaneous interpretation is provided)

	City/Organization	Title	Name
1	Nasouri, Suva	Chief Executive Officer/Special Administrator	Mr. Akhtar Ali
2	Naga	City Councilor	Dr. Carmelino Jr N. Cruz
3	San Fernando	Municipal Mayor	Dr. Lakambini G. Reluya
4	Ulaanbaatar	Specialist in charge of Information Technology	Mr. Baasanjav Sanjaa
5	The Ministry of the Environment, Japan (MOEJ)	Researcher	Mr. Yusuke Sai
6	Amata Corporation PCL	Chief Investment Officer	Ms. Lena Ng
7	JOIN	Senior Director	Mr. Tsutomu Yoshigi
8	Green Climate Fund	Senior Water Sector Specialist	Prof. Alastair M. Morrison
9	Finetech Co., Ltd.	President and C.E.O	Mr. Motoyuki Okada
10＊	Penang	Town Planner	Mr. Ma'ruf Suria Erwin Bin Mohamed Adros
11＊	Bandung	Director	Mr. Suhono Supangkat
12＊	German Embassy	Senior Advisor for Trade Policy and Economics	Ms. Shikibu Oishi
13＊	Embassy of the Republic of Fiji	Ambassador Extraordinary & Plenipotentiary	Mr. Isikeli Uluinairai Mataitoga

＊commentator

6th Asia Smart City Conference

Needs And Challenges

Addressing Energy and transport issues

Presented by: Akhtar Ali (CEO) **Fiji Islands**

Background

- Hub of the Pacific
- Fiji consists of over 300 Islands
- Suva is the Capital city surrounded by 3 supporting municipalities
- 150,000 population with 300,000 commuting daily with a vibrant mix of ethnic culture and tradition.
- Rapidly evolving with substantial growth in Energy and transport sectors

Needs and Challenges

- High energy demand
- Rapid urbanization
- Excessive pressure on existing resources
- Infrastructure demand - require 4 lane access highway along Suva Nausori corridor – currently under construction
- High import bills
- High energy consumption
- Excess waste production
- High waste management costs
- Real estate demand – shortage of housing
- Informal settlements in peri-urban setting

Addressing challenges – urban management

- City parking meters changed to solar powered (renewable enegy)
- To introduce solar street lights, parks and gardens lights.
- Promote use of alternative fuel (biodiesel) for council fleet operations
- Better urban planning to promote greening of towns and cities
- Creation of more walkways to promote people walking to city
- Encourage cycling and car pooling and provide safe parking in town/cities
- Govt subsidy on modern buses
- Improvement in trunk routing to decrease traffic congestion

Energy challenges & mgt

- Greening of building
- Promote use of renewable energy
- Fiji advances towards 90% renewable energy production by 2025
- Maintaining open spaces/ parks & gardens
- Promoting planting of trees
- Encourage rooftop gardens
- Reducing paved areas- having permeable spacers for increased filtration

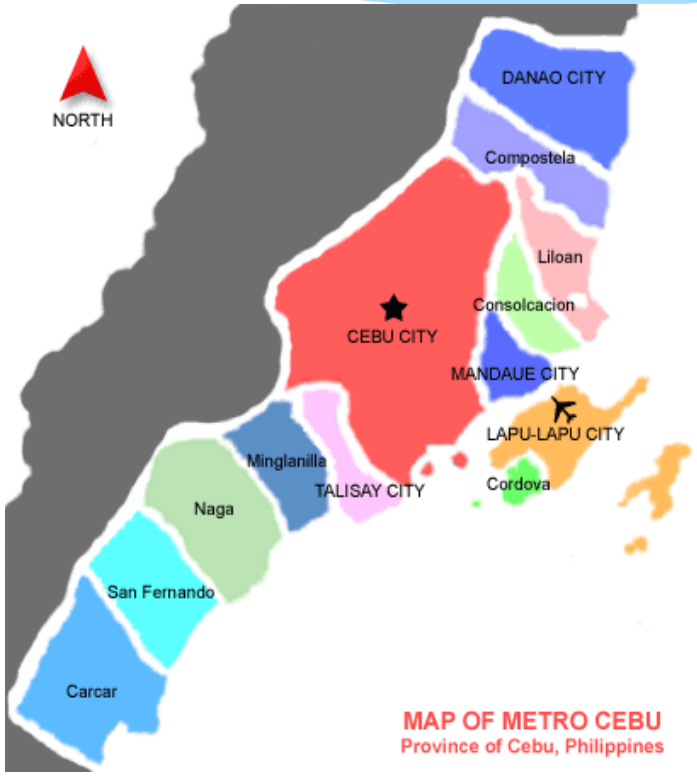
The City of Naga, Cebu Experience:

Needs & Challenges and Current Efforts in the Energy and Transport Sectors

By: DR. CARMELINO N. CRUZ, JR.

City Councilor

Context of Presentation: City of Naga as part of Metro Cebu



Energy Sector: Needs and Challenges

- Daily Peak Power Requirement of 500MW
  - Average Metro Cebu requirement during peak hours
- Vulnerability of Power Plants to Natural Disasters
  - Recent damage to geo-thermal power plants in Leyte due to earthquake
- Need for additional Power Generation Facilities
  - Power interruptions due to preventive maintenance and repairs
  - Capacity to cope with the growing consumer demands
  - Clean Energy ventures

Energy Sector: Current Efforts of the City of Naga

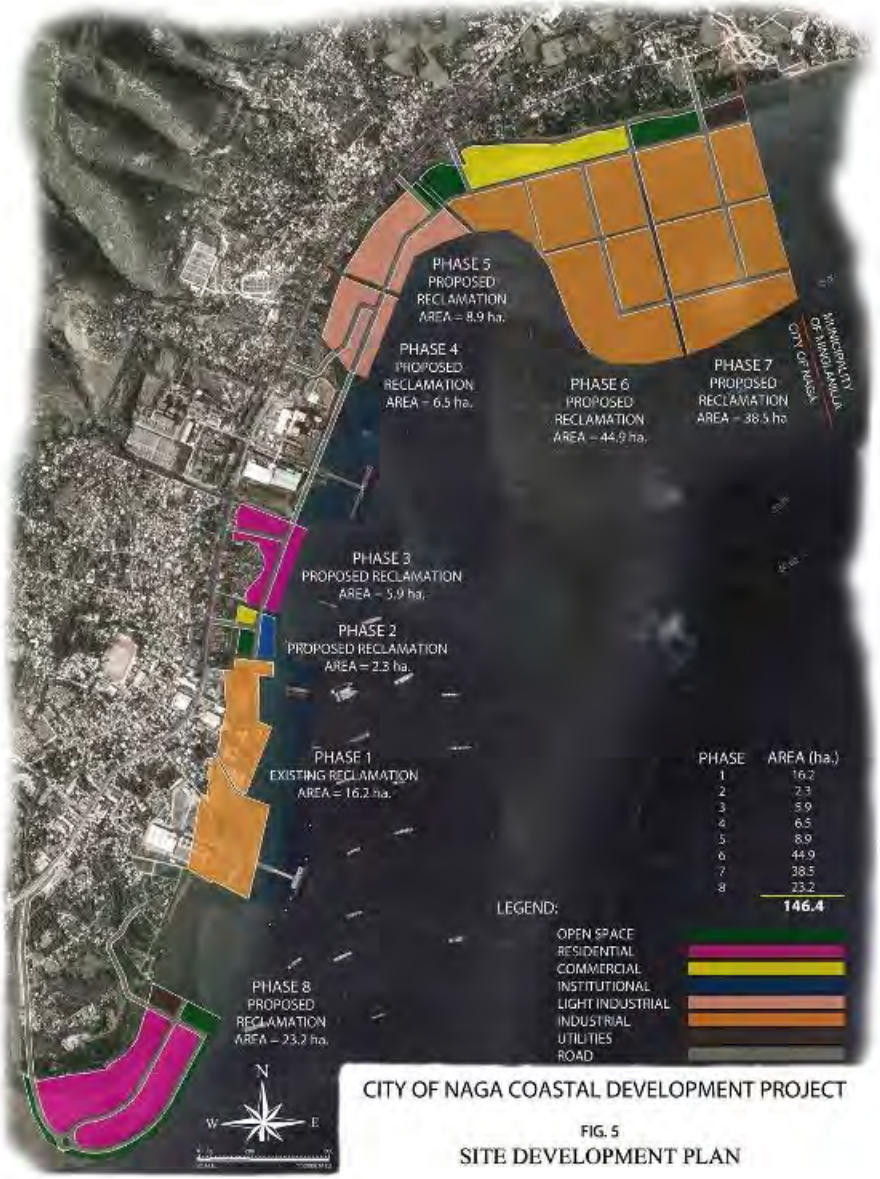
- ✓ Partnered with PNOC-Renewables Corporation
  - Generate Solar energy 100kw for local government building requirements
- ✓ Pioneered Prepaid Electricity
  - For government-owned commercial buildings and public schools
- ✓ Support for Power Generation Initiatives from Solid Waste Management:
  - 4.5MW capacity Waste Heat-To-Energy Facility in APO Cement
  - 760kw per hour from Biogas Plant of FDR-IRRMI

Transport Sector: Needs and Challenges

- Road Network Infrastructure to accommodate increasing number of road users
  - Average 10% increase in new vehicles registered
- Traffic Management
  - Worsening traffic situation
- Mass Transport System Needs

Transport Sector: Current Efforts of the City of Naga

- To spread development to Southern Cebu:
  - Expansion of NAGA COASTAL DEVELOPMENT PROJECT (City Reclamation Project) approx. 130 hectares for alternative road and commercial-industrial facilities
  - Formal offer to the Province of Cebu to acquire the 25 hectares Tina-an Property for mixed-use complex
  - Construction of pier to transport people and goods to neighboring islands



CITY OF NAGA COASTAL DEVELOPMENT PROJECT

FIG. 5

SITE DEVELOPMENT PLAN

CITY OF NAGA
CEBU, PHILIPPINES

Daghang Salamat,

Thank You Very Much!

San Fernando Sea Ports and Reclamation Projects

- Philippine Nautical Highway (Central Spine) from Luzon connecting Visayas and Mindanao.
- APPROVED by the Department of Transportation (DoTR).

Projected Clients

- Cruise Ships
- Roll on Roll off local and international vessels (RORO)
- Passenger ships – fastcrafts, sea taxi,

Availability of workforce

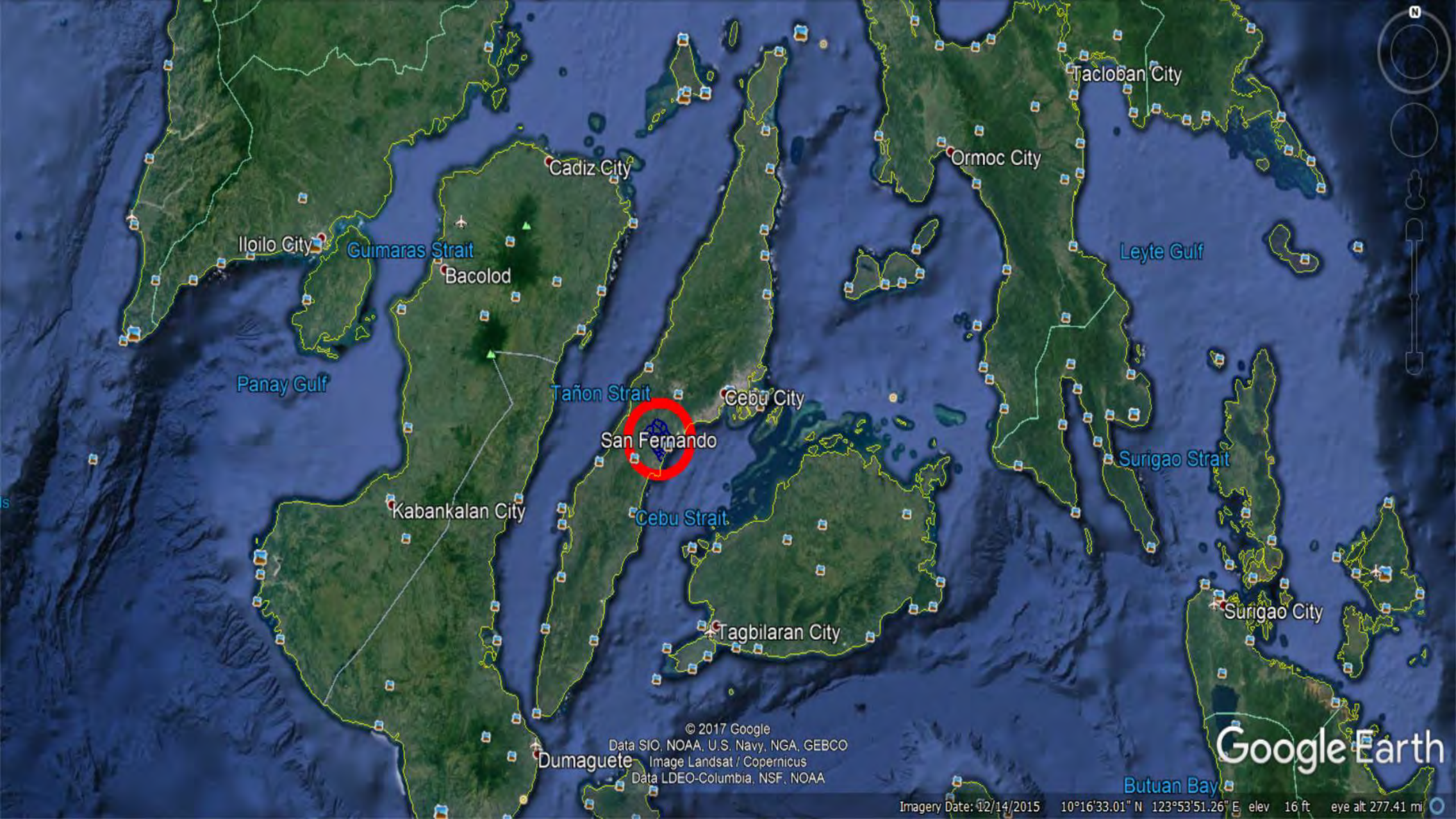
Big opportunity for investors

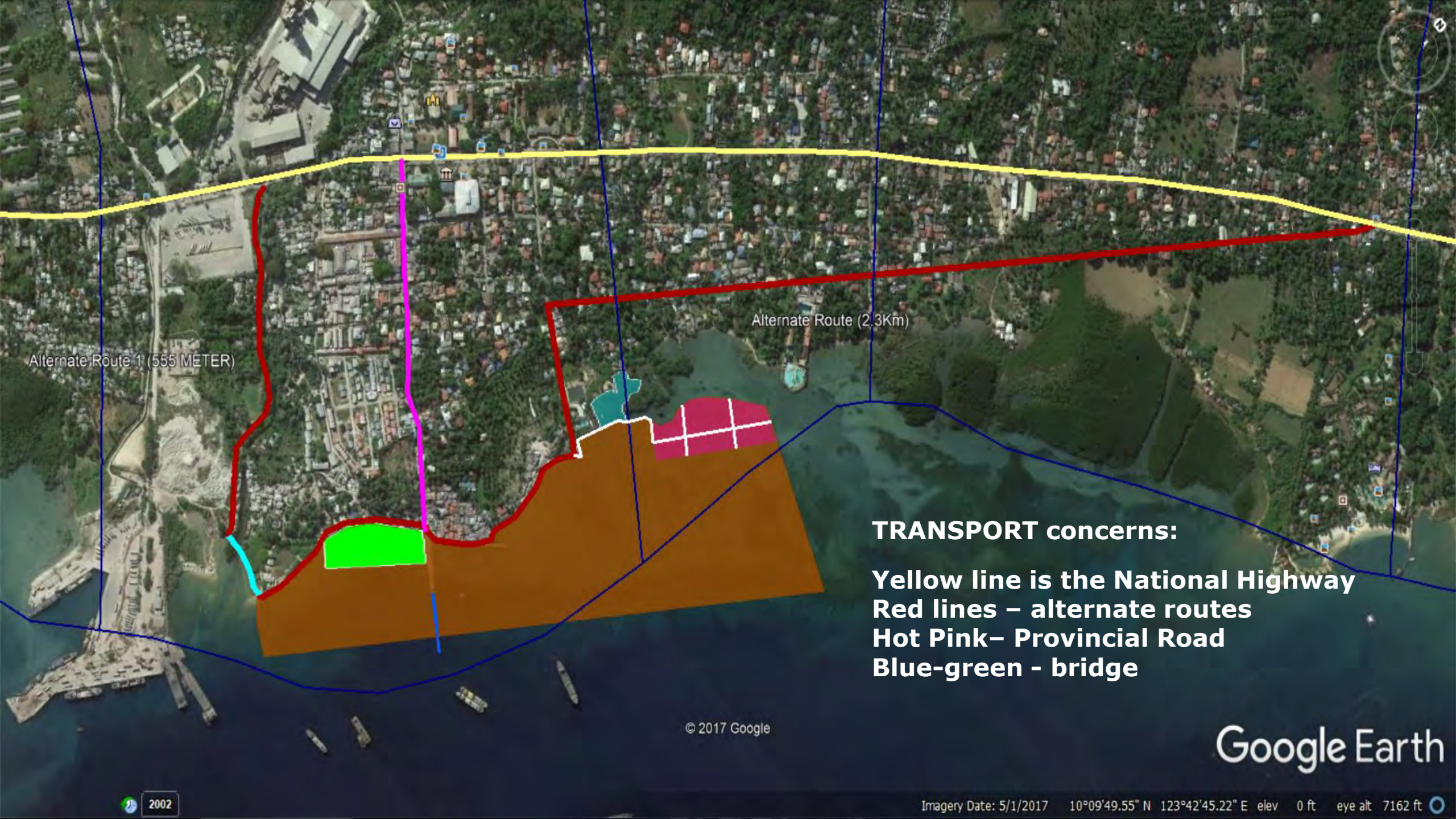
Efficient and committed leadership

Open for joint venture / undertaking

No fault lines as per Phivolcs

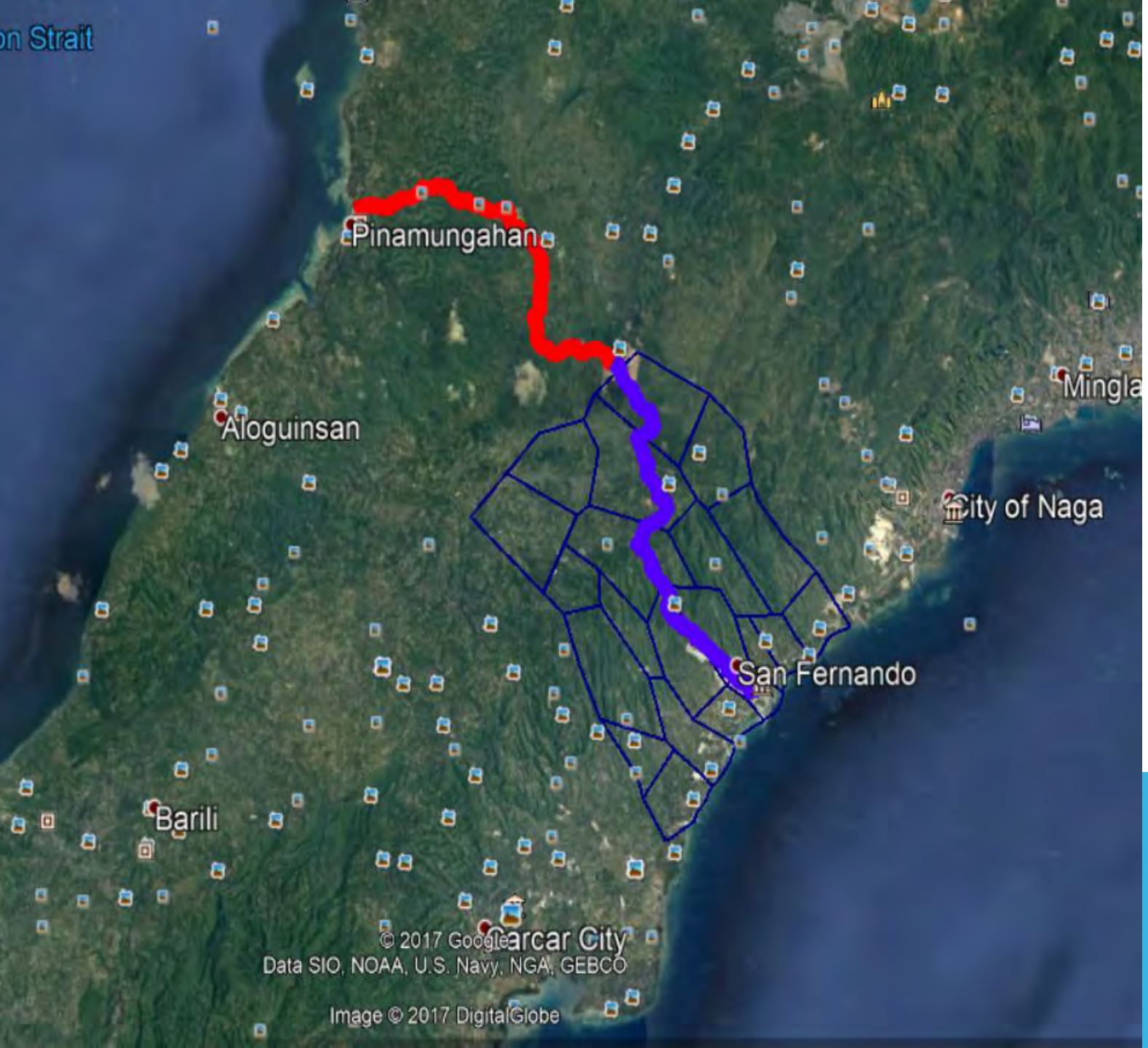
We are a shining local government unit … SHINE with us.


Tacloban City
Ormoc City
Cadiz City
Iloilo City
Guimaras Strait
Bacolod
Leyte Gulf
Panay Gulf
Tañon Strait
Cebu City
San Fernando
Surigao Strait
Kabankalan City
Cebu Strait
Surigao City
Tagbilaran City
© 2017 Google
Data SIO, NOAA, U.S. Navy, NGA, GEBCO
Image Landsat / Copernicus
Data LDEO-Columbia, NSF, NOAA
Dumaguete
Butuan Bay
Google Earth
Imagery Date: 12/14/2015 10°16'33.01" N 123°53'51.26" E elev 16 ft eye alt 277.41 mi



TRANSPORT concerns:

Yellow line is the National Highway
Red lines – alternate routes
Hot Pink– Provincial Road
Blue-green - bridge

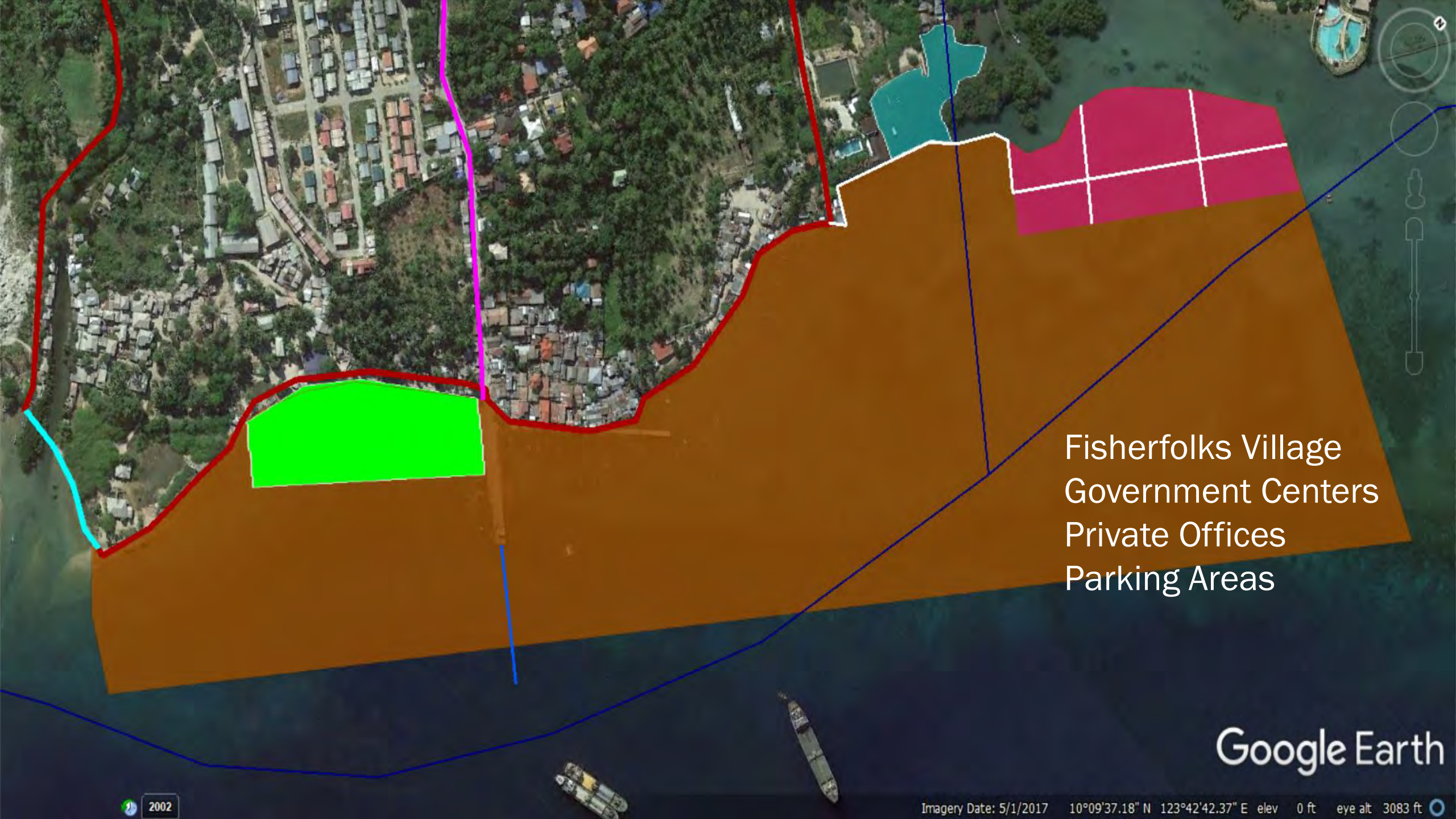


San Fernando Hiway 8 to Bugho, San Fernando Boundary is 13 km.

Bugho, San Fernando Boundary to Pinamungahan proper is 14km.

Being converted into a national road for the provincial road connects two districts.

It takes less than an hour from the East side of Cebu to the West side of it.


Fisherfolks Village
Government Centers
Private Offices
Parking Areas
Google Earth
2002
Imagery Date: 5/1/2017 10°09'37.18" N 123°42'42.37" E elev 0 ft eye alt 3083 ft

ULAANBAATAR CITY

Administration Department,
Office of the Capital City Governor

2017

CITY STATISTICS

TERRITORY

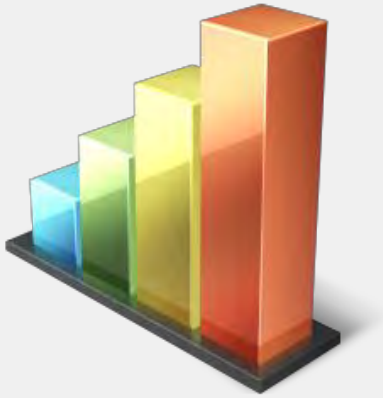
4700 km^2

(0.3% of Mongolia)

POPULATION

1.3 million

(46% of Mongolia)



GDP

6715.5 million USD

(63% of Mongolia)

LOANS

84% of Mongolia

AUTOMOBILE

59% of Mongolia

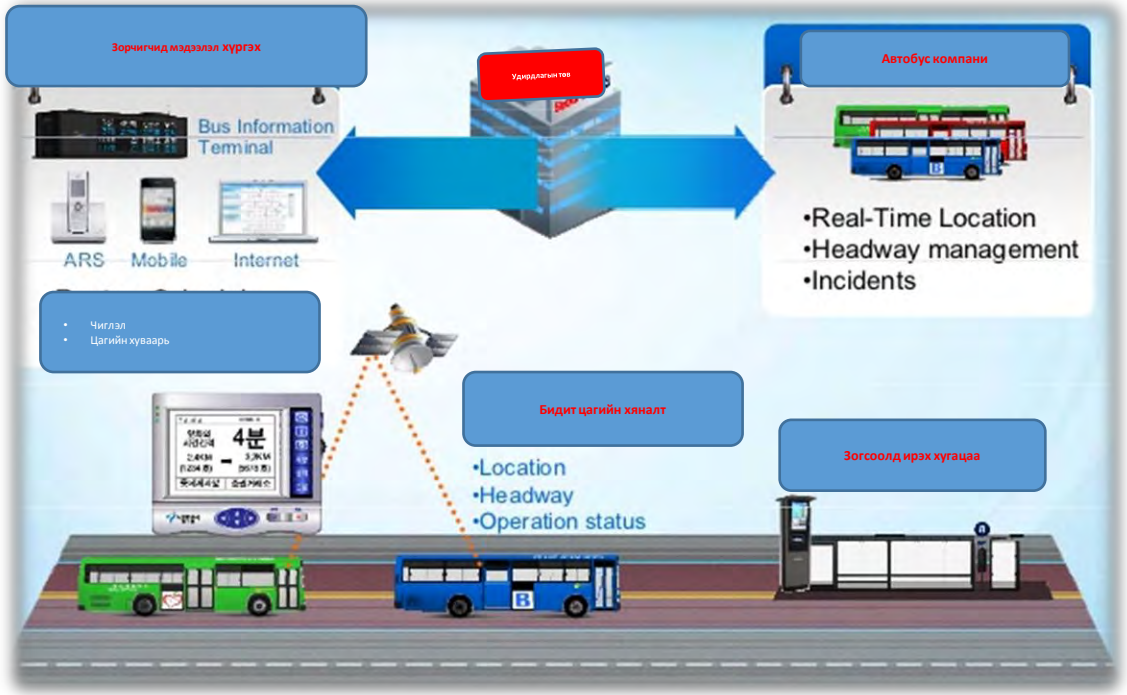
SAVINGS

83% of Mongolia

ABOUT MONGOLIA

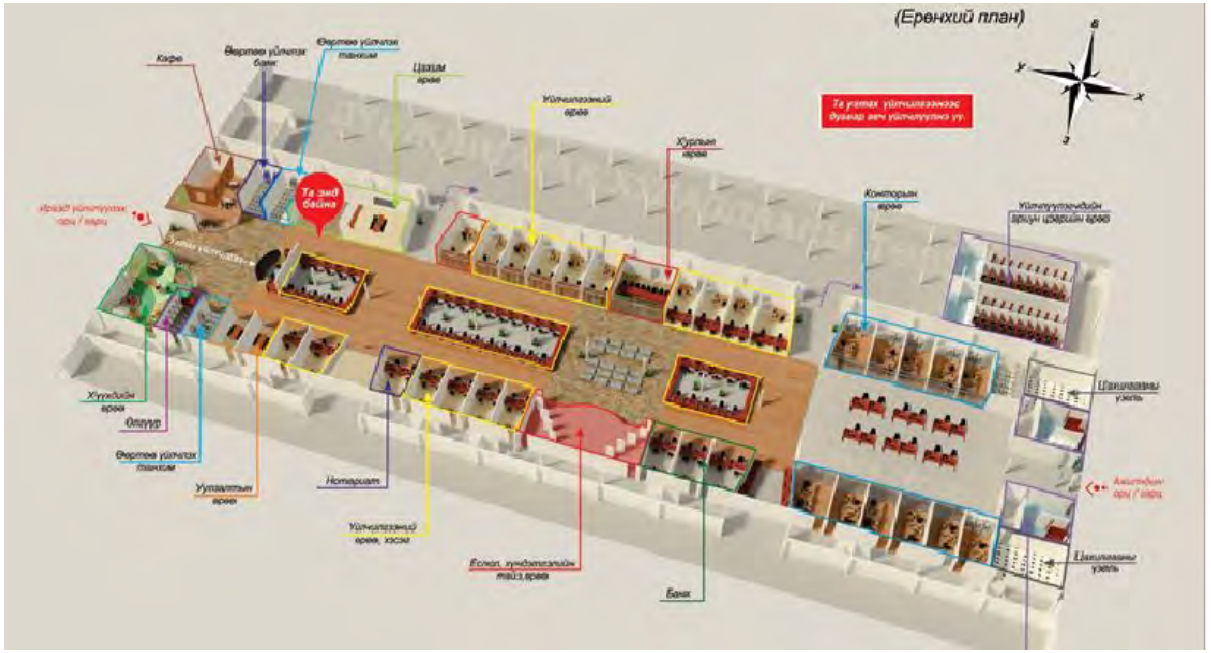
Smart Public Transportation

Management, information and Smart card payment system



- Equipments were installed in **1,250** buses and trolleybuses
- Smart cards are sold out through **451** selling and charging points
- Over **1,100,000** smart cards were sold since the launch of the project.
- In average **740,000** people travel in one day.
- **“Traffic Management Center”** provides with records of daily mobilization, monitoring and integrated management for public transportation services.

Capital city integrated service center (CCISC)



Since 2016 to current, over 2 million individuals and legal entities took services of the CCISC. Ulaanbaatar city has 4 branches in which more than 330 types of services of the 28 public organizations are dealt directly through the service centers.

THANK YOU FOR YOUR ATTENTION

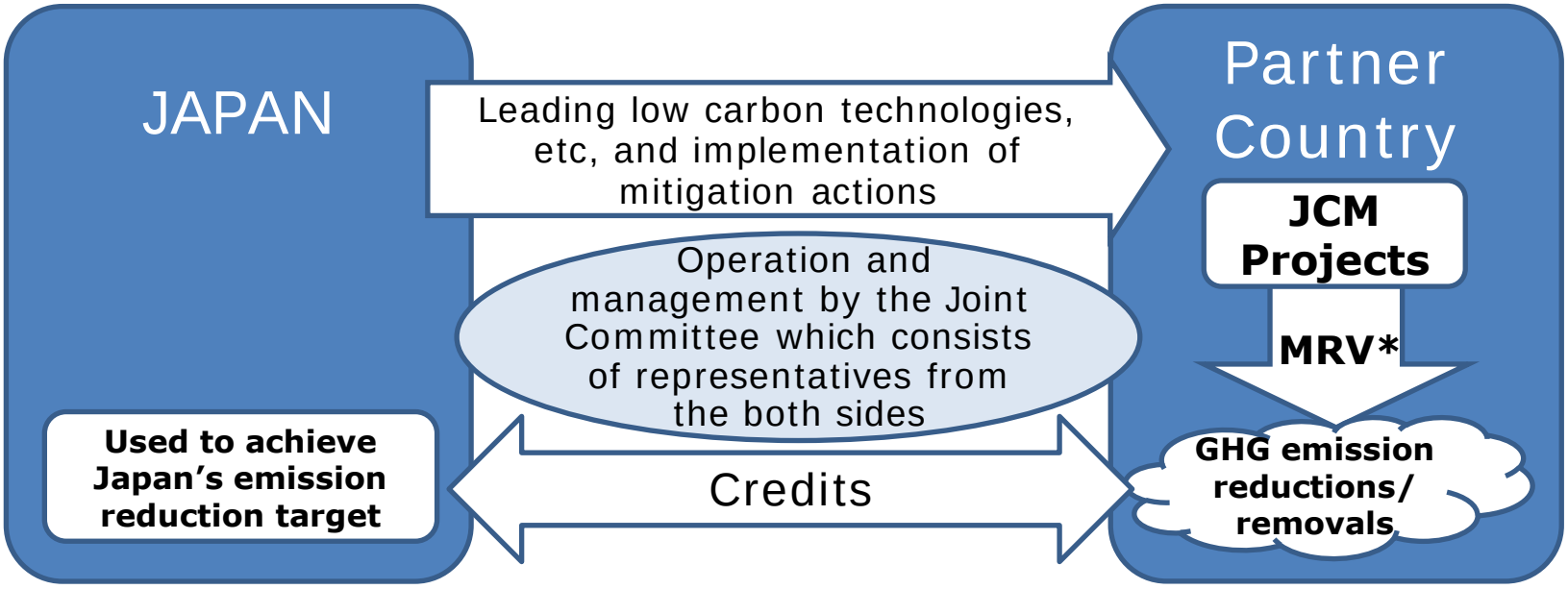
The Joint Crediting Mechanism (JCM)

27th Oct. 2017

Ministry of the Environment Japan

Basic Concept of the JCM

- Facilitating diffusion of leading low carbon technologies, products, systems, services, and infrastructure as well as implementation of mitigation actions, and contributing to sustainable development of developing countries.
- Appropriately evaluating contributions from Japan to GHG emission reductions or removals in a quantitative manner and use them to achieve Japan's emission reduction target.
- Contributing to the ultimate objective of the UNFCCC by facilitating global actions for GHG emission reductions or removals.



*measurement, reporting and verification

Technology transferred by JCM finance support

Japan will address the high initial cost barrier of introducing advanced low-carbon technologies in developing countries through the

Waste heat recovery in Cement Industry, JFE engineering, Indonesia

Eco-driving with Digital Tachographs, NITTSU, Vietnam

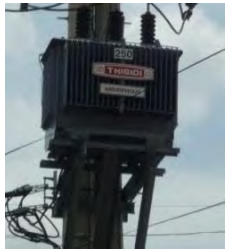
Energy saving at convenience stores, Panasonic, Indonesia

High efficiency air-conditioning and process cooling, Ebara refrigeration equipment & systems, Indonesia

High-efficiency Heat only Boilers, Suuri-Keikaku, Mongolia

Upgrading air-saving loom at textile factory, TORAY etc., Indonesia, Thai, Bangladesh

Installing solar PV system, PCKK, Palau Maldives



Amorphous transformers in power distribution, Hitachi Materials, Vietnam

Co-generation system at factory, Toyota, Nippon Steel & Sumikin Engineering, Indonesia, Thai

High efficiency air-conditioning system, Hitachi, Vietnam

High efficiency air-conditioning system, Daikin, Vietnam

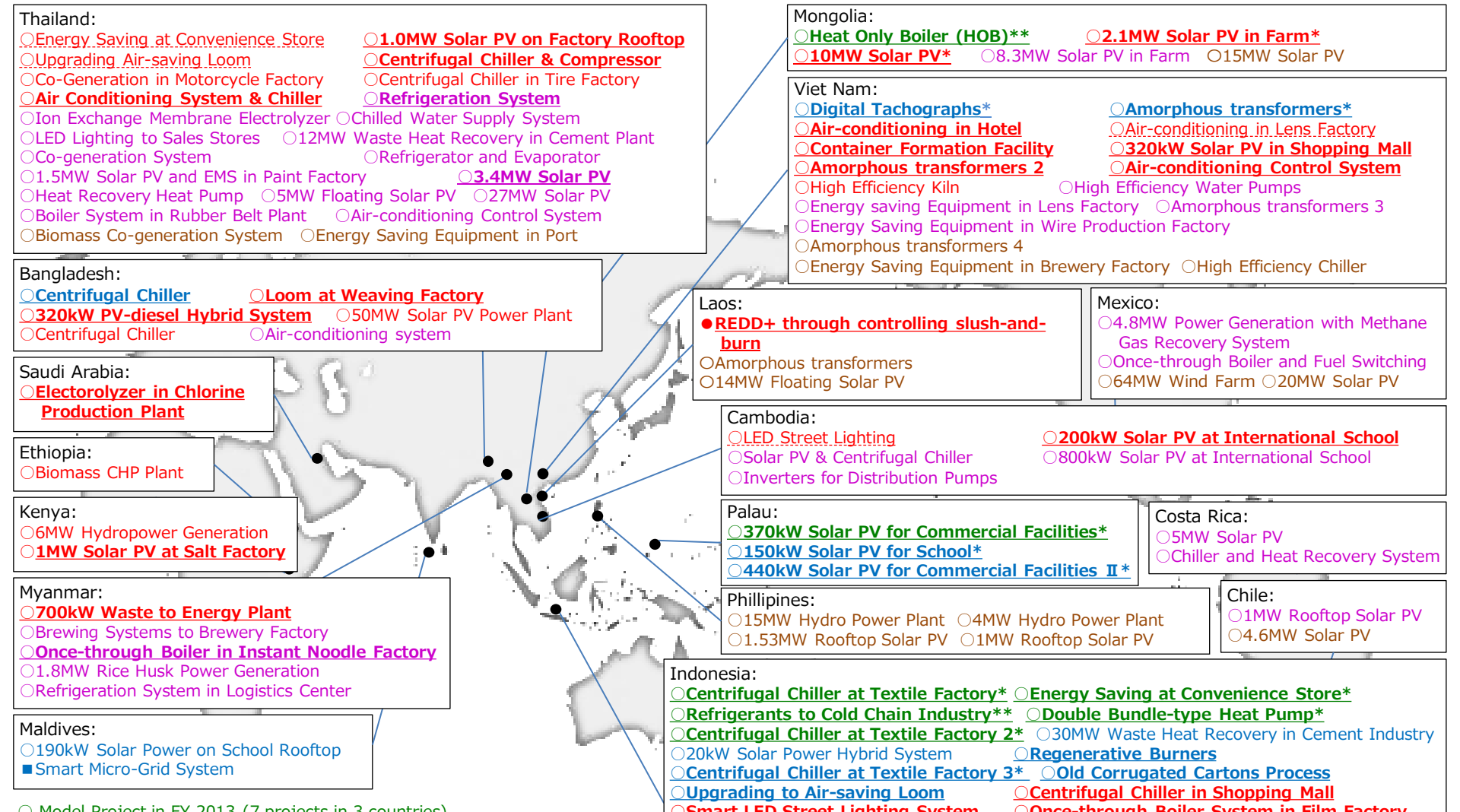
Waste to Energy Plant, JFE engineering, Myanmar

High efficient refrigerator, Mayekawa MFG, Indonesia

Regenerative Burners in industries, Toyotsu Machinery, Indonesia

LED street lighting system with wireless network control, MinebeaMitsumi、Cambodia

JCM Financing program by MOEJ (FY2013～2017) as of June 2017



Thailand:
- ○Energy Saving at Convenience Store
- ○**1.0MW Solar PV on Factory Rooftop**
- ○Upgrading Air-saving Loom
- ○**Centrifugal Chiller & Compressor**
- ○Co-Generation in Motorcycle Factory
- ○Centrifugal Chiller in Tire Factory
- ○**Air Conditioning System & Chiller**
- ○**Refrigeration System**
- ○Ion Exchange Membrane Electrolyzer
- ○Chilled Water Supply System
- ○LED Lighting to Sales Stores
- ○12MW Waste Heat Recovery in Cement Plant
- ○Co-generation System
- ○Refrigerator and Evaporator
- ○1.5MW Solar PV and EMS in Paint Factory
- ○**3.4MW Solar PV**
- ○Heat Recovery Heat Pump
- ○5MW Floating Solar PV
- ○27MW Solar PV
- ○Boiler System in Rubber Belt Plant
- ○Air-conditioning Control System
- ○Biomass Co-generation System
- ○Energy Saving Equipment in Port

Bangladesh:
- ○**Centrifugal Chiller**
- ○**Loom at Weaving Factory**
- ○**320kW PV-diesel Hybrid System**
- ○50MW Solar PV Power Plant
- ○Centrifugal Chiller
- ○Air-conditioning system

Saudi Arabia:
- ○**Electorolyzer in Chlorine Production Plant**

Ethiopia:
- ○Biomass CHP Plant

Kenya:
- ○6MW Hydropower Generation
- ○**1MW Solar PV at Salt Factory**

Myanmar:
- ○**700kW Waste to Energy Plant**
- ○Brewing Systems to Brewery Factory
- ○**Once-through Boiler in Instant Noodle Factory**
- ○1.8MW Rice Husk Power Generation
- ○Refrigeration System in Logistics Center

Maldives:
- ○190kW Solar Power on School Rooftop
- ■Smart Micro-Grid System

Mongolia:
- ○**Heat Only Boiler (HOB)****
- ○**2.1MW Solar PV in Farm***
- ○**10MW Solar PV***
- ○8.3MW Solar PV in Farm
- ○15MW Solar PV

Viet Nam:
- ○**Digital Tachographs***
- ○**Amorphous transformers***
- ○**Air-conditioning in Hotel**
- ○Air-conditioning in Lens Factory
- ○**Container Formation Facility**
- ○**320kW Solar PV in Shopping Mall**
- ○**Amorphous transformers 2**
- ○**Air-conditioning Control System**
- ○High Efficiency Kiln
- ○High Efficiency Water Pumps
- ○Energy saving Equipment in Lens Factory
- ○Amorphous transformers 3
- ○Energy Saving Equipment in Wire Production Factory
- ○Amorphous transformers 4
- ○Energy Saving Equipment in Brewery Factory
- ○High Efficiency Chiller

Laos:
- ●**REDD+ through controlling slush-and-burn**
- ○Amorphous transformers
- ○14MW Floating Solar PV

Mexico:
- ○4.8MW Power Generation with Methane Gas Recovery System
- ○Once-through Boiler and Fuel Switching
- ○64MW Wind Farm
- ○20MW Solar PV

Cambodia:
- ○LED Street Lighting
- ○**200kW Solar PV at International School**
- ○Solar PV & Centrifugal Chiller
- ○800kW Solar PV at International School
- ○Inverters for Distribution Pumps

Palau:
- ○**370kW Solar PV for Commercial Facilities***
- ○**150kW Solar PV for School***
- ○**440kW Solar PV for Commercial Facilities Ⅱ***

Costa Rica:
- ○5MW Solar PV
- ○Chiller and Heat Recovery System

Phillipines:
- ○15MW Hydro Power Plant
- ○4MW Hydro Power Plant
- ○1.53MW Rooftop Solar PV
- ○1MW Rooftop Solar PV

Chile:
- ○1MW Rooftop Solar PV
- ○4.6MW Solar PV

Indonesia:
- ○**Centrifugal Chiller at Textile Factory***
- ○**Energy Saving at Convenience Store***
- ○**Refrigerants to Cold Chain Industry****
- ○**Double Bundle-type Heat Pump***
- ○**Centrifugal Chiller at Textile Factory 2***
- ○30MW Waste Heat Recovery in Cement Industry
- ○20kW Solar Power Hybrid System
- ○**Regenerative Burners**
- ○**Centrifugal Chiller at Textile Factory 3***
- ○**Old Corrugated Cartons Process**
- ○**Upgrading to Air-saving Loom**
- ○**Centrifugal Chiller in Shopping Mall**
- ○**Smart LED Street Lighting System**
- ○**Once-through Boiler System in Film Factory**
- ○**Gas Co-generation System**
- ○**Once-through Boiler in Golf Ball Factory**
- ○1.6MW Solar PV in Jakabaring Sport City
- ●**REDD+ through controlling slush-and burn**
- ○10MW Hydro Power Plant
- ○Looms in Weaving Mill
- ○LED Lighting to Sales Stores
- ○Industrial Wastewater Treatment System
- ○0.5MW Solar PV
- ○Gas Co-generation system
- ○1MW Solar PV
- ○Air-conditioning utility system in Airport

○ Model Project in FY 2013 (7 projects in 3 countries)
○ Model Project in FY 2014 (12 projects in 5 countries)
■ ADB Project in FY 2014 (1 project in 1 country)
○ Model Project in FY 2015 (33 projects in 10 countries)
○ Model Project in FY 2016 (37 projects in 10 countries)
● REDD+ Model Project (2 projects in 2 countries)
○ Model Project in FY 2017 (18 projects in 8 countries)
* Other 1 project in Malaysia

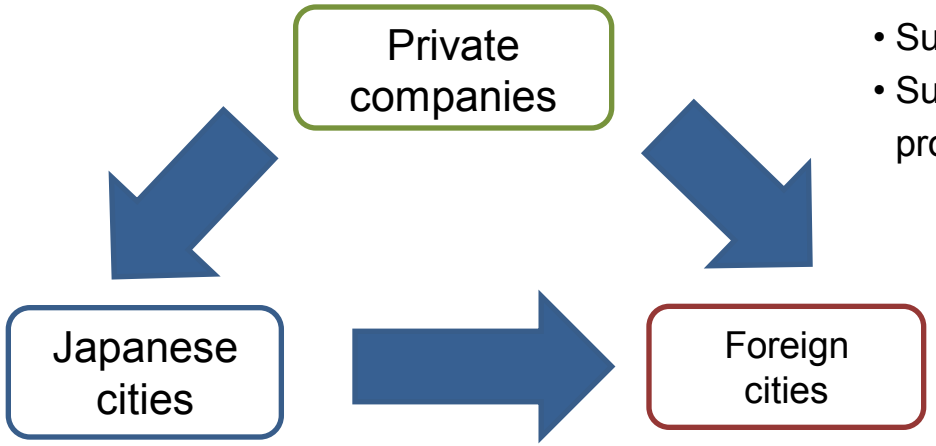
Total 110 projects in 17 partner countries

Underlined projects have started operation (46 projects, including 4 partially started projects)
Projects with * have been registered as JCM projects (16 projects)

City to city collaboration program

◆ Basic concept of city to city collaboration program

Private companies arrange the cooperation between Japanese cities and foreign cities. Japanese cities support the foreign cities with their knowledge and experience for low carbon society.



- Role of private companies
  - Survey for local needs for projects
  - Survey for suitable technology and venders for projects

- Role of Japanese cities
  - Support to design master plan and action plan
  - Support to design the technical evaluation criteria and environment criteria

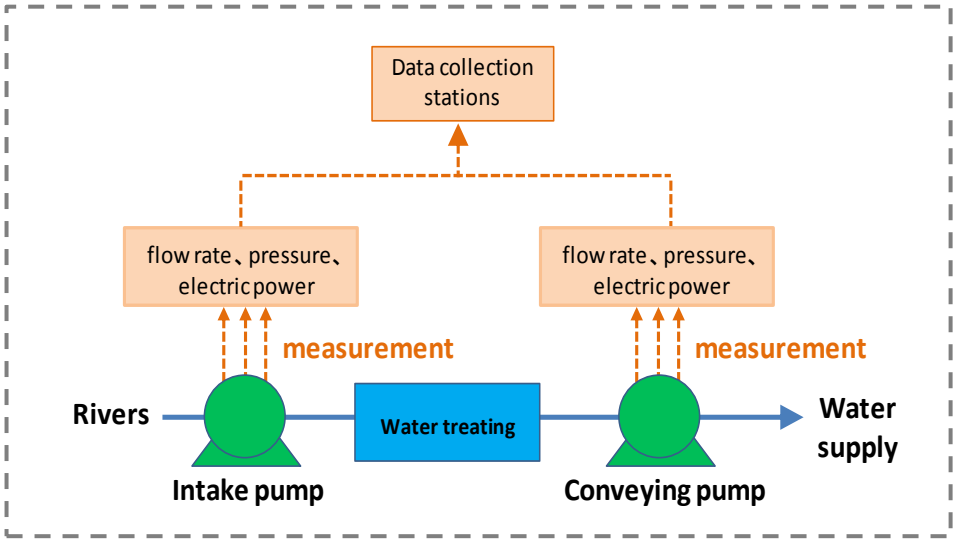
◆ Effect

- Support to create low carbon project efficiently
- Support to design the local systems to promote low carbon projects (ex: master plan, action plan)
- Capacity building ; informative advice for the technology evaluation and environment criteria etc.

JCM Model Project - Introduction of High Efficiency Water Pumps in Da Nang City -

Outline of GHG Mitigation Activity

This project aims to replace existing conventional water pumps with high efficiency pumps in two water pump stations of the treatment plant owned by Danang Water Supply One-member Limited Company (DAWACO).
The pumps to be installed perform with high efficiency because pumps are customized to specific conditions and requirements of the recipient plants.



Expected GHG Emission Reductions

1,145 [tCO_2/year]
＝(Reference CO_2 Emissions) － (Project CO_2 Emissions)
＝ ((Reference Power Consumption)－(Project Power Consumption)) [MWh/year] * Emission Factor [tCO_2/MWh]

[Treatment plant Cau du 1]
118 [tCO_2/year] = ((2,199.74– 1,982.03)[MWh/year] * 0.5408[tCO2/MWh]

[Treatment plant Cau du 2]
1,027 [tCO_2/year] = (19.196.44 – 17,296.62)[MWh/year] * 0.5408[tCO_2/MWh]

Sites of Project

6th AAMATA City Conference 2017

AAMATA at a Glance

established in 1989	Registered Capital: **120 million** Baht
SET listed on 14 Jul 1997	Registered Capital: **1,067 million** Baht (Mkt cap 23.47 Billion Baht – Oct. 2017)
affiliated companies	**31** companies
Economic contribution	**10%** of Thai GDP
total land bank	**7,000 Hectares** (Thailand – 4,800 ha ,Vietnam – 1,970 ha, Myanmar –100 ha, Laos – 130 ha)
total factories	**1,200** factories (700 Japanese factories)
total population	**300,000** people (5,000 Japanese expats)
foreign investors	**> 30** nationalities

*SET – Stock Exchange of Thailand

By: Ms. Teng Ng, Chief Investment Officer
PCL

THAI GOVERMENT

WORLD-CLASS SMART CITY STRATEGIC PARTNERS

MOU signing ceremony between Thailand Ministry of Energy and AMATA on March 14th, 2017

1) General Anantaporn Kanjanarat, Minister of Thailand Ministry of Energy, 2) Air Chief Marshal Prajin Juntong, D... Prime Minister of Thailand, 3) Dr. Twarath Sutabutr, Director-General, Energy Policy and Planning Office (EPPO)... Vikrom Kromadit, Chief Executive Officer of AMATA Corporation, 5) Mr. Junichi Hashimoto, VP & Executive Dire... Hitachi High-Technologies Corporation.

Ministry of digital, MOU signing on SMAR... Sept...

EEC and National Taiwan University on AMATA EDUTOWN, 8 September 2017

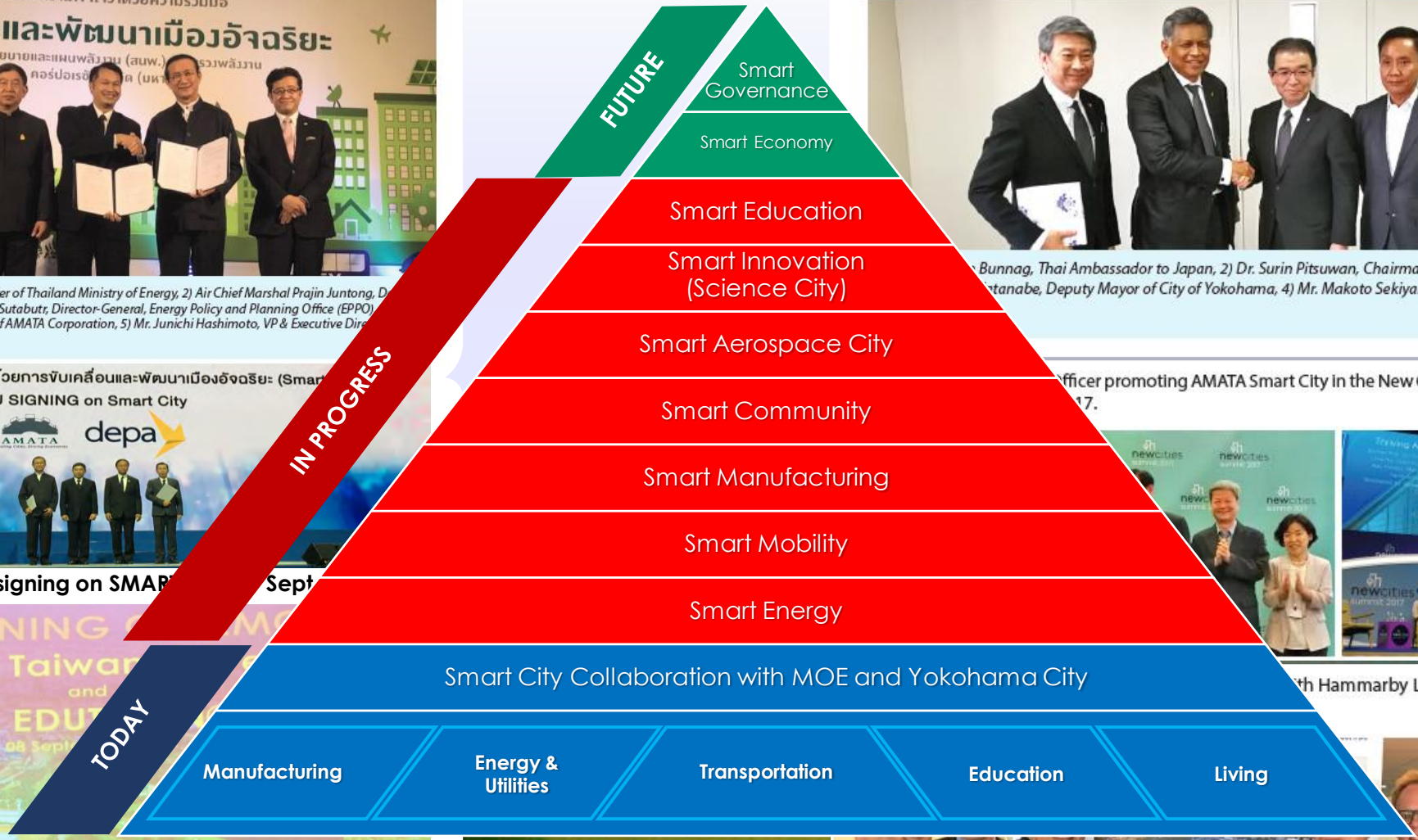
Smart City Collaboration

AMATA's Chairman visit underscore closer cooperation with Yokohama on May 18th, 2017

... Bunnag, Thai Ambassador to Japan, 2) Dr. Surin Pitsuwan, Chairman of AMATA Corporation, 3) ...tanabe, Deputy Mayor of City of Yokohama, 4) Mr. Makoto Sekiyama, Director General of City

...fficer promoting AMATA Smart City in the New Cities Summit 2017, Incheon ...17.

...th Hammarby Lake City, Sweden on June

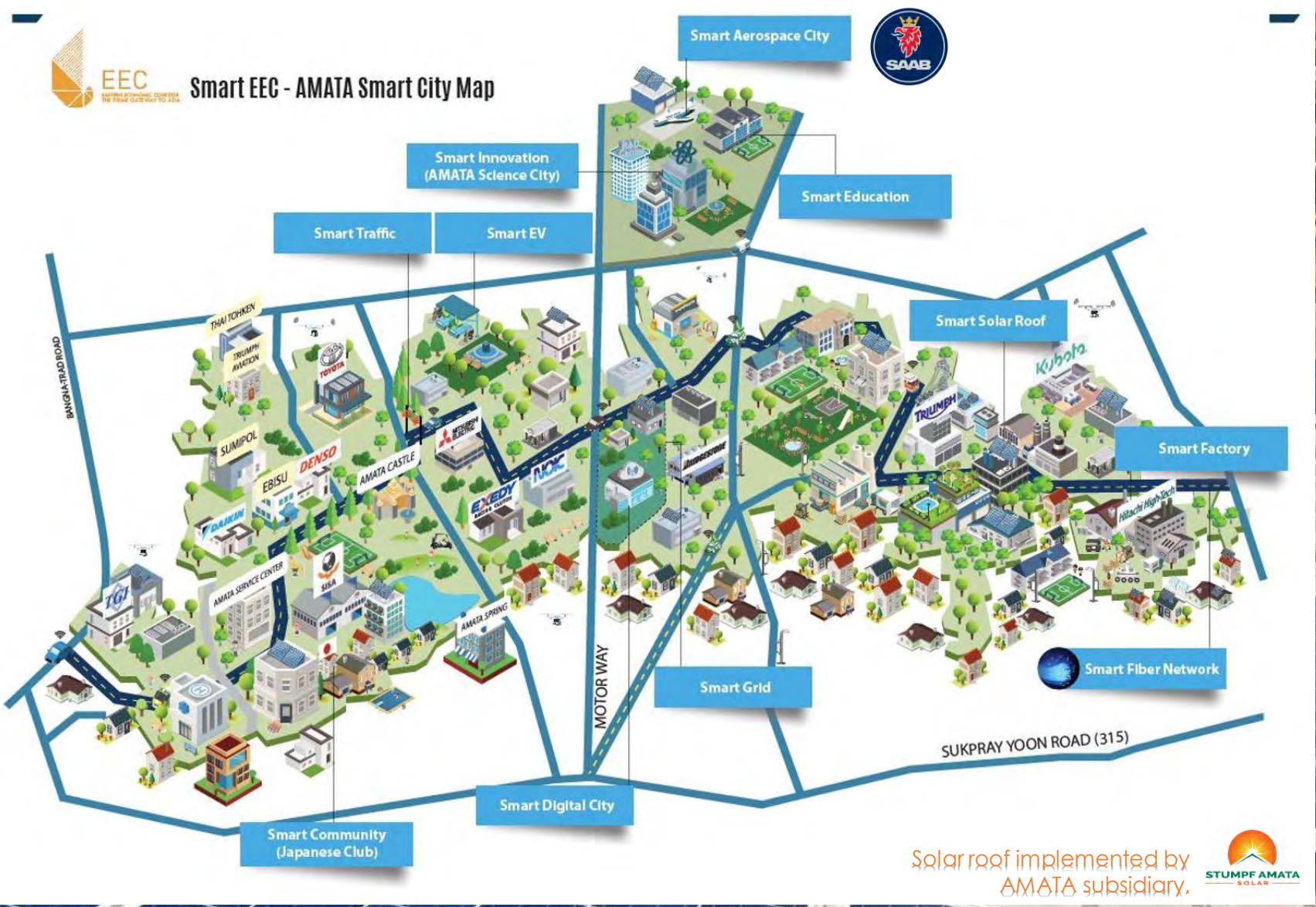


GOAL

- **Developed Land**: 400 square kilometers
- **Population**: 0.8-1 million
- **GDP**: 60-80 billion dollars

AMATA Smart City Statement

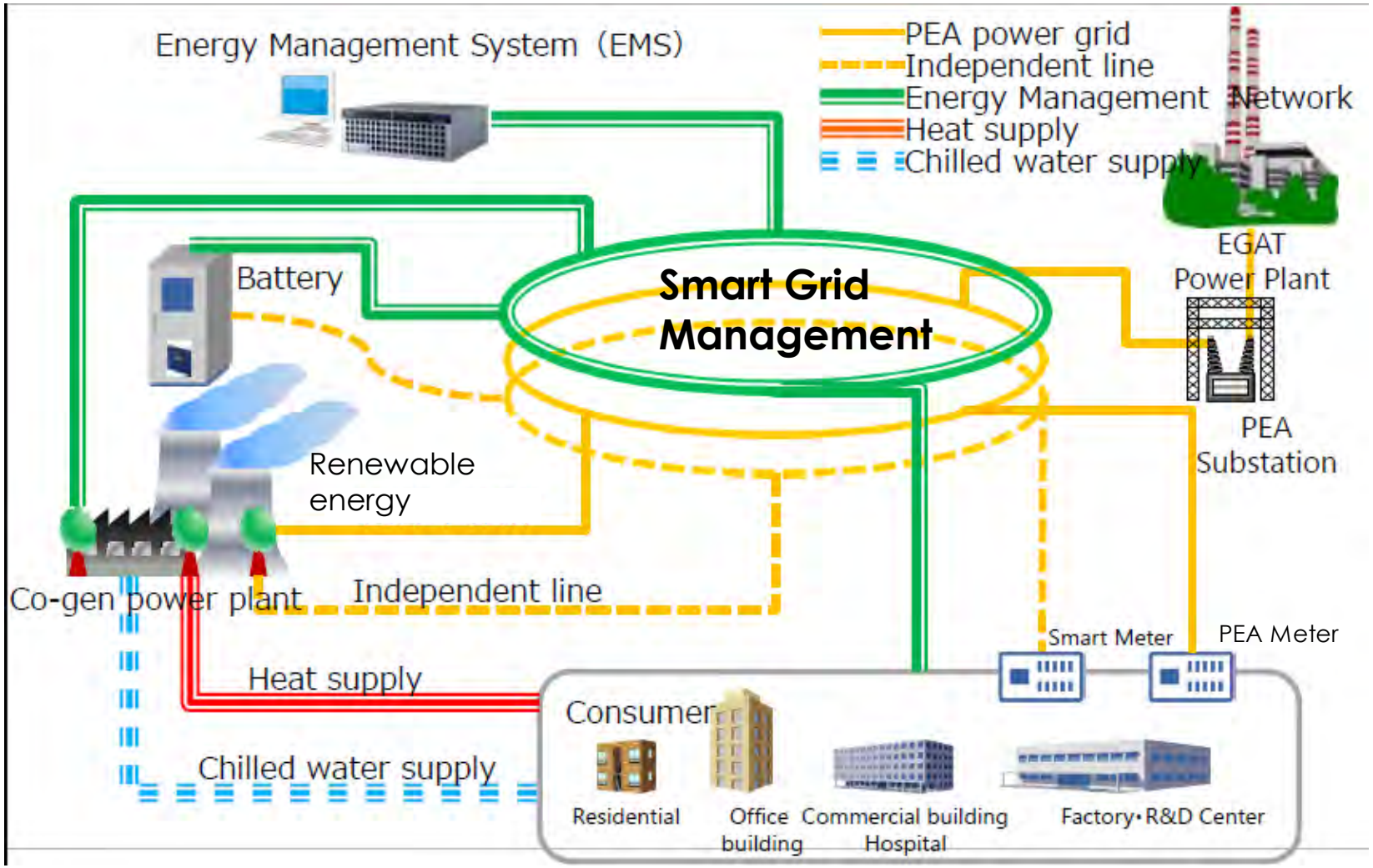
AMATA Smart City vision is to be **a self-reliant, energy-efficient city with renewable energy sources** and sustainable environmental management.



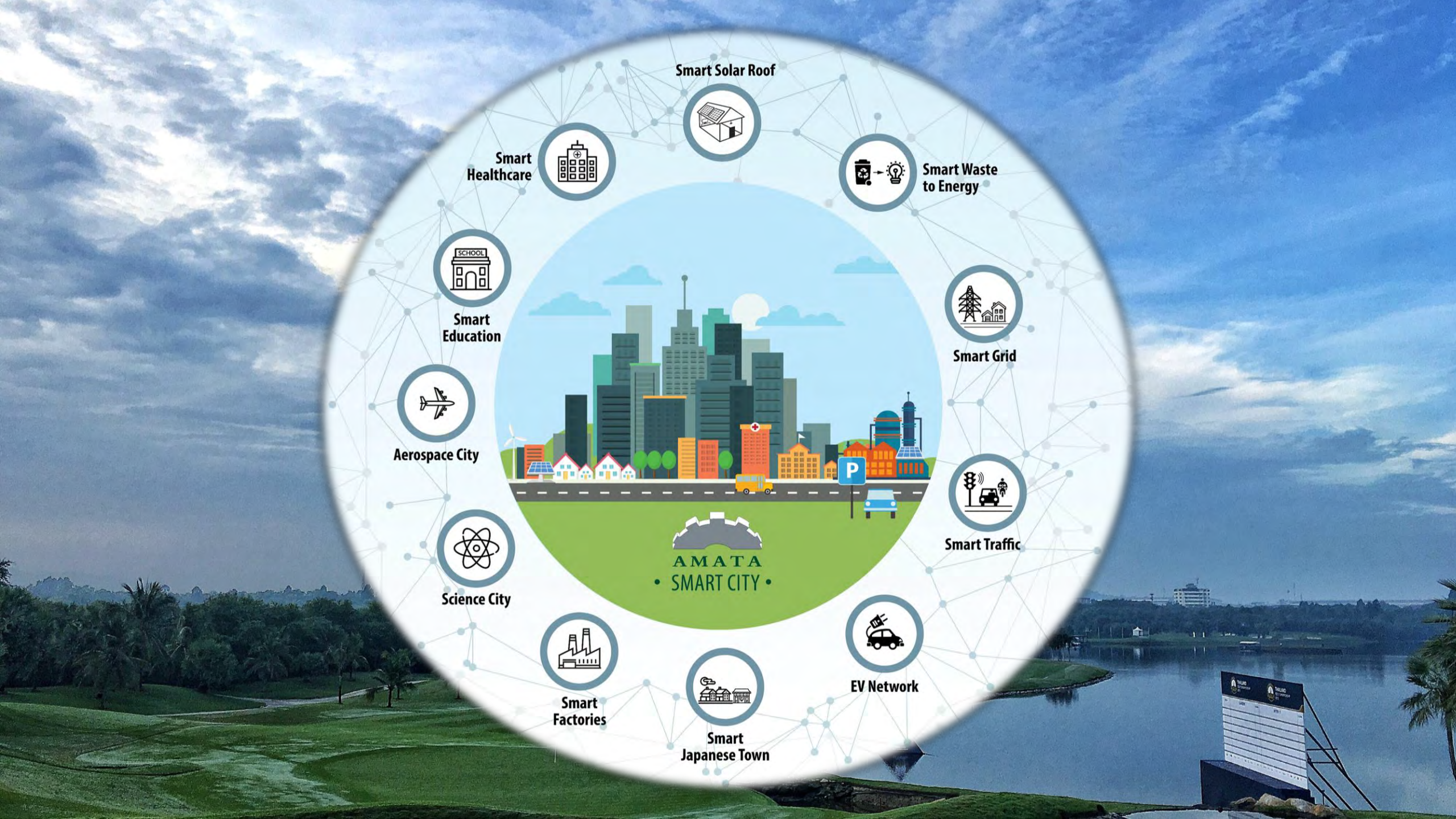
Solar roof implemented by AMATA subsidiary, STUMPF AMATA SOLAR

Smart Energy Goals 2040:

1) Self Reliant with **Smart Grid Management**
2) **20% Renewable Energy (Solar, Wind, Waste to Energy, Geothermal Energy)**



	Today	Future (in 2040)
Land size	4,200 Hectare	8,000 Hectare
Factories	728	1,300
Power Consumption	1,100 MW	1,800 MW
Power Capacity	750 MW	1,800 MW

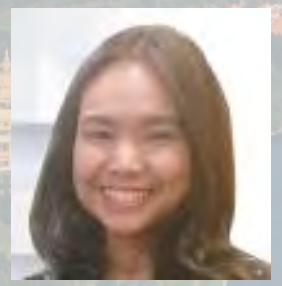

Smart Solar Roof
Smart Healthcare
Smart Waste to Energy
SCHOOL
Smart Education
Smart Grid
Aerospace City
P
Smart Traffic
AMATA
• SMART CITY •
Science City
Smart Factories
EV Network
Smart Japanese Town

AMATA SMART CITY TEAM

Ms. Lena Ng
Chief Investment Officer
Email:lena@amata.com

Mr. Pongsakorn Limpakarnwech
Smart City Lead
Email:pongsakorn@amata.com

Mr. Nol Ruangnaovarat
Urban Development Manager
Email:nol@amata.com



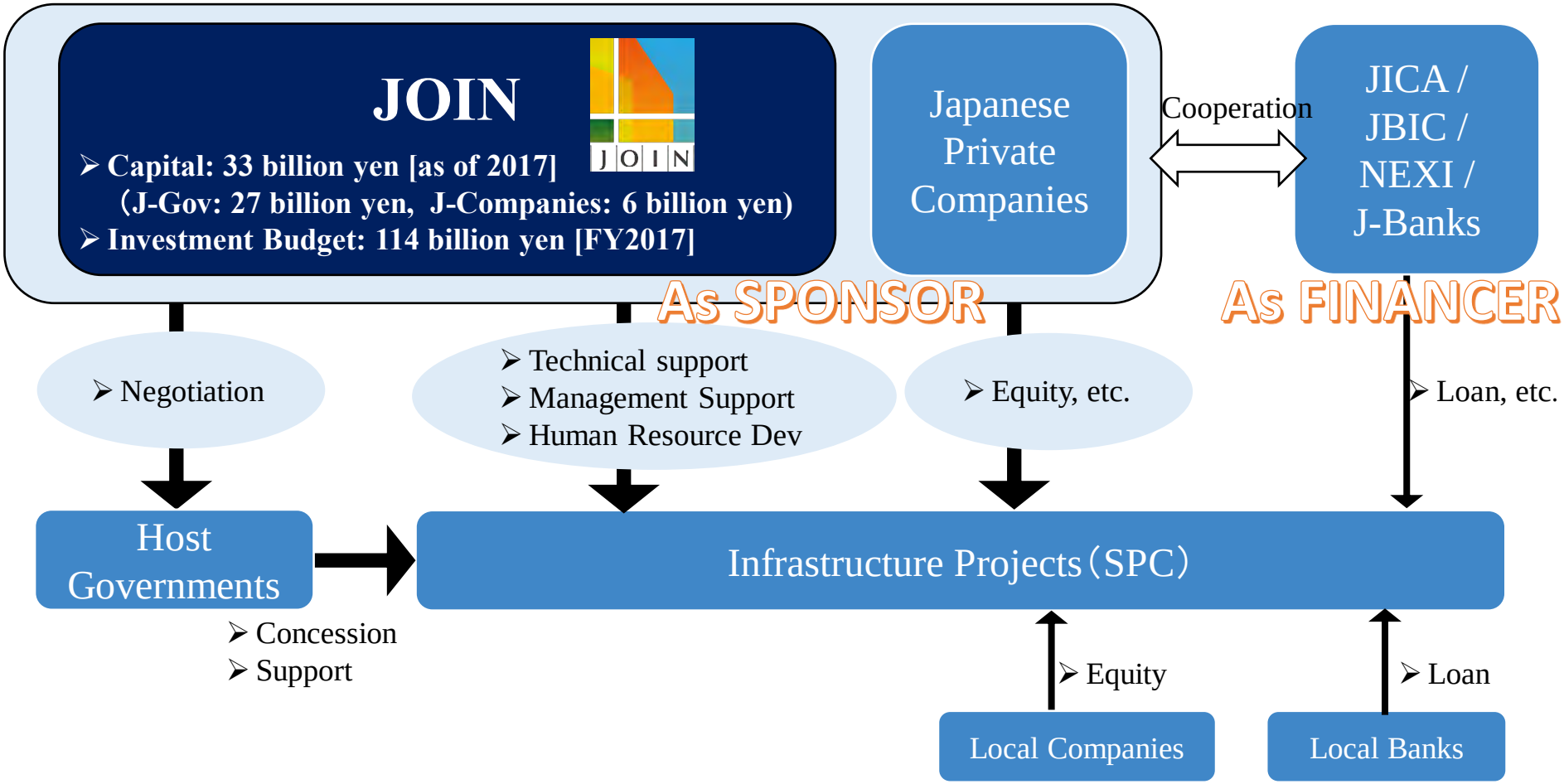
Ms. Yatisha Siamwalla
Urban Development Officer
Email:yatisha@amata.com

JOIN

- Japan Overseas Infrastructure Investment Corporation for Transport & Urban Development -

1. What is JOIN's role?

JOIN plays a role to 1) invest in projects jointly with private companies, 2) negotiate at the government-level, and/or 3) provide Hands-on support



2. JOIN's Focused Sectors

Wide Variety

1. Transport
2. Urban development
3. Related areas supporting to Transport and Urban development

Diversity

- NO country criteria for investment
- NOT only for emerging country BUT also Developed

Green field / Brown field

- Both New Projects(Green field) and Existing Projects (Brown field)

High-speed railways

Urban railways / transport system

Toll Roads

Ships / Offshore units

Port

Aviation/Airport

Logistics

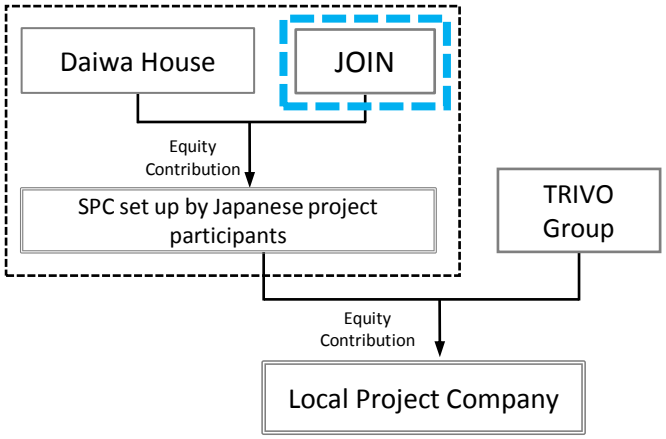
Urban development

3. JOIN's Projects: Jakarta Southeast Urban Dev. [Indonesia]

Summary

- Investment to participate in the construction and operation of the mixed-use urban development on about a 12 hectare area in the South East region of Jakarta jointly with Daiwa House Industry Co., Ltd. and Trivo Group.
- JOIN's investment : JPY3.0bil (US$27mil), approved in July 2017

Scheme



Project Site map

Source: Processed by JOIN using Open Street Map


Image

- Usage: Mixed Housing Complex (12 bldgs, approx. 5,000 units), Commercial Facilities
- Site Area: approx. 120,000 ㎡
- Total Floor Area: approx. 640,000 ㎡
- Completion Period: Within 2024 (plan)

Benefits for Indonesia and Japan

- The project adds a high value to the area through the formation of an abundant green environment and waterfront, the installation of expressway ICs, reformation of surrounding roads and the connectivity to the LRT which is currently under construction.
- Encourage the participation of Japanese companies for the first time in Indonesia and promotes Japanese housing products and housing management service in Jakarta.

4. Smart City Projects: New Clark City [Philippines]

Partnership with the Philippines' Bases Conversion Development Authority on materializing the development of New Clark City

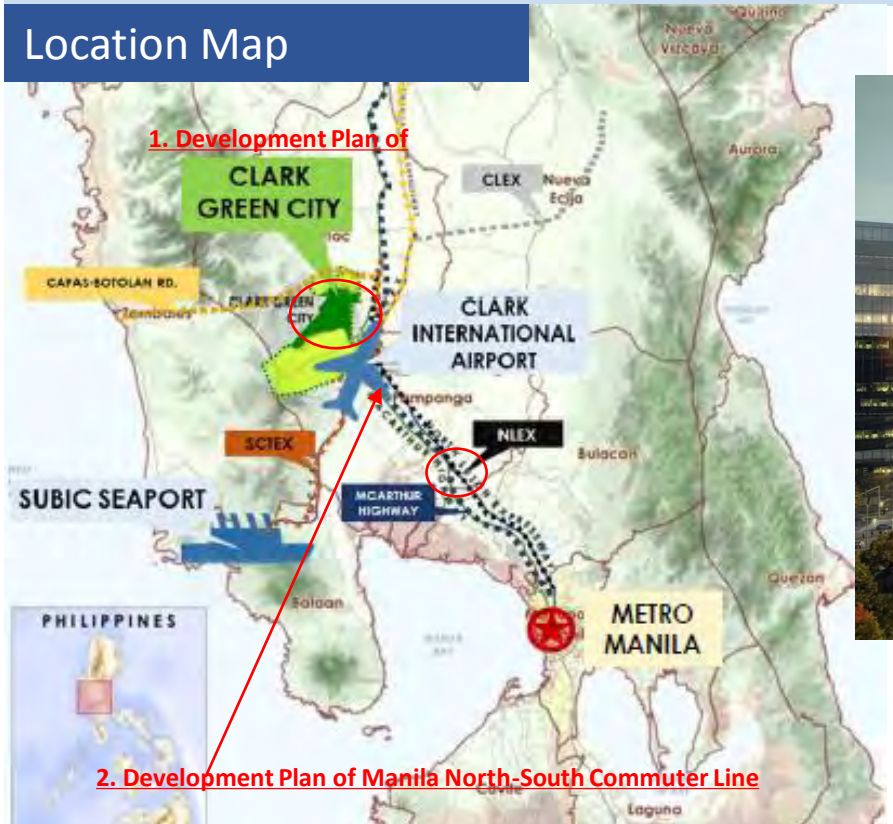
①Clark Green City Development Plan

CGC is a new project aimed at developing the land around Clark International Airport. It is situated about 120km north-west of Manila.

②Extension Plan of Manila North-South Commuter Line

The project aims to develop the extension of the Metro Manila's urban railway line between Malolos City and Manila and planning of further extension from Malolos City to CGC.

Location Map



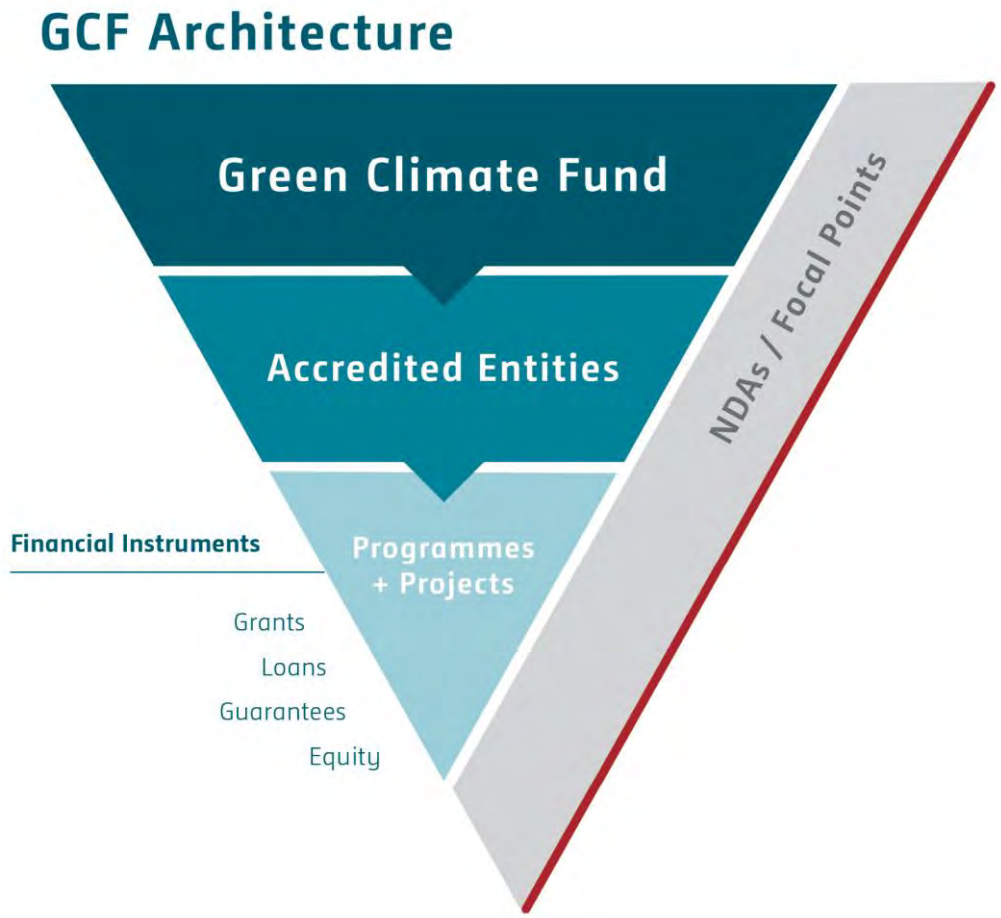
GREEN CLIMATE FUND

Towards energy saving/low carbon urban development

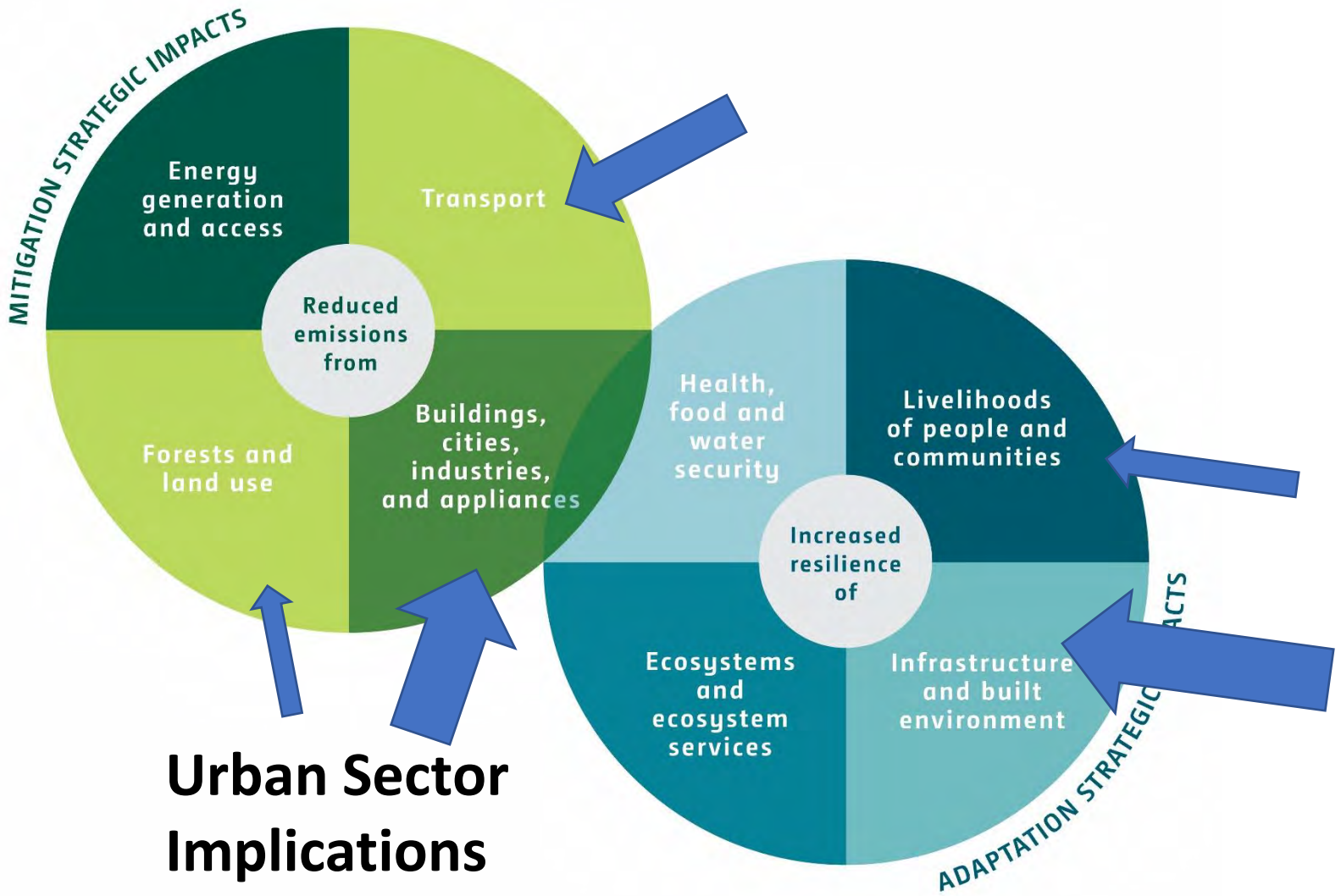
Alastair Morrison
Senior Water Sector Specialist
on behalf of
Drazen Kucan
Senior Urban Specialist
Division of Mitigation and Adaptation

6th Asia Smart Cities Conference
27 October 2017 | Yokohama, Japan

The GCF Architecture



Eight GCF Results Areas; several fundamental implications for the urban sector

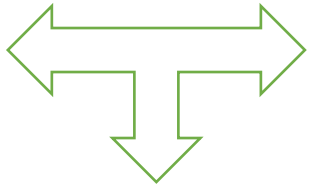


Urban Sector Implications

Urban Sector Implications

Translating the PA to Development Realities

The Paris Agreement



KEY CLIMATE FINANCE (CF) ISSUES:

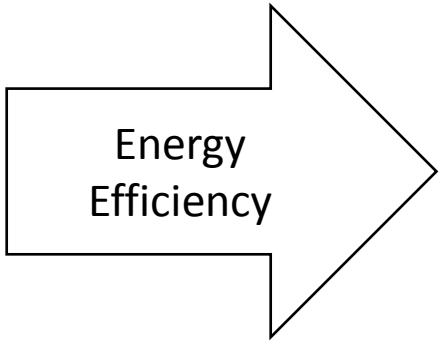
- **Scaling up of climate finance,** flows and transformative transactions;
- Increasing financial flows to **adaptation**;
- Helping to overcome **barriers** such as affordability constraints, first-mover risks, behavioral and perceived risks, low technology penetration rates;
- **Private sector and mitigation**: over 80% of global CF flows to renewable energy investments indicate a narrow, perhaps less than well diversified trend;
- **Green financing** still only a niche investment strategy for mainstream institutional investors.

- **Policy Frameworks and Enabling Environments** as initial triggers;

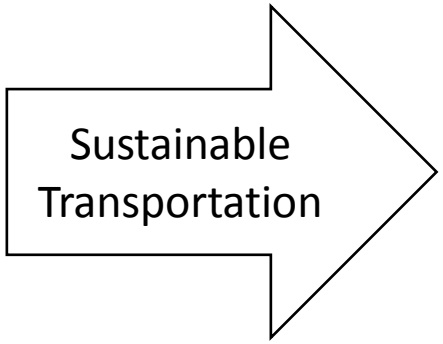
- **Public money** as a 'seed' money (guarantees, insurance, incentives, knowledge and policy support, preparatory technical assistance, etc.) **to attract and mobilize private finance** with staying power through de-risking structures and transformative interventions;

- **GCF and other DFIs** are front-runners, first movers: bold strategic and innovative brushes to mark investment and development opportunities; followed by coherent and yet innovative structures and long term commitment.

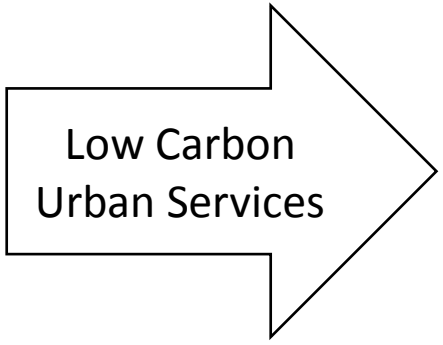
Decarbonisation of cities: infrastructure, services, governance, finance



- Energy efficiency improves to a level consistent with country's development;
- Specific emissions decrease through energy savings and cleaner power generation;
- A modernized energy systems enhances quality of low carbon energy services



- Logistically efficient, seamless, low or zero emissions multimodal system supports sustainable and equitable movement of people and goods;
- Dependable, energy efficient and safe transport services supports and contributes a highly productive green / low carbon economy;
- Multimodal transport system combines technological innovations and modern logistics which is vital for the competitiveness of the city.



- Universal access to low carbon urban services (water, wastewater, waste management, energy, transportation, etc.);
- Low carbon output and transit oriented cities with better livability and accessibility provide added value to its inhabitants and businesses;
- Recycling, energy recovery, renewable energy sources provide job and investment opportunites.

Structural change of today and tomorrow needs to be driven by green, low carbon interventions

- Developing countries, in particular, are keen to learn what are the policy interventions that will lead to faster structural changes, i.e. significant changes in **the output and employment structure**, focusing primarily on cities as engines of growth.
- However these structural changes and 'catching up / leveling-off' competition cannot happen any more in a 'business as usual' fashion, given how fast the global carbon budget is being depleted. **Structural change needs to be decisively and irrevocably green & low carbon to be transformational.**

This is where the space for GCF intervention in the urban sector is being defined: seeking and intervening to develop "capabilities" and resilience to undertake the required changes that will lead to the transformation of the decarbonized and sustainable economy

Where are we today - urban

Current pipeline:

- Green Cities Ethiopia: joint interest of AfDB and DFID; keenly supported by the NDA Ethiopia
  - early conceptual discussions, up to $200 million combined grant/HC loan potential;

- Green Cities EBRD CN / FP: advanced discussions on supporting 10-12 cities across EBRD's countries of co-operation in their low carbon development and greening with a significant upscaling potential towards issuance of the green bond
  - CN announced for August 2017; up to $250 million combined grant / LC / guarantee instrument potential

- IDB City of Asuncion / Paraguay: Urban Renewal Program
  - CN initially rejected with a strong recommendation to revert to PFF for further core studies; PFF application is currently being submitted;
  - Up to $400 million combined instruments potential.
- EIB City of Yerevan: Sustainable urban transportation Program
  - Early conceptual discussions; CN expected by September 2017
- ADB Ulaanbaatar Affordable Housing Urban Renewal project
  - CN submitted and in large part rejected due to $60 million grant request with $175 million HC loan request for essentially housing development initiative

For more info, visit **www.greenclimate.fund**

Quick links

GCF 101

GCF portfolio

Accredited Entity composition

Resources mobilized

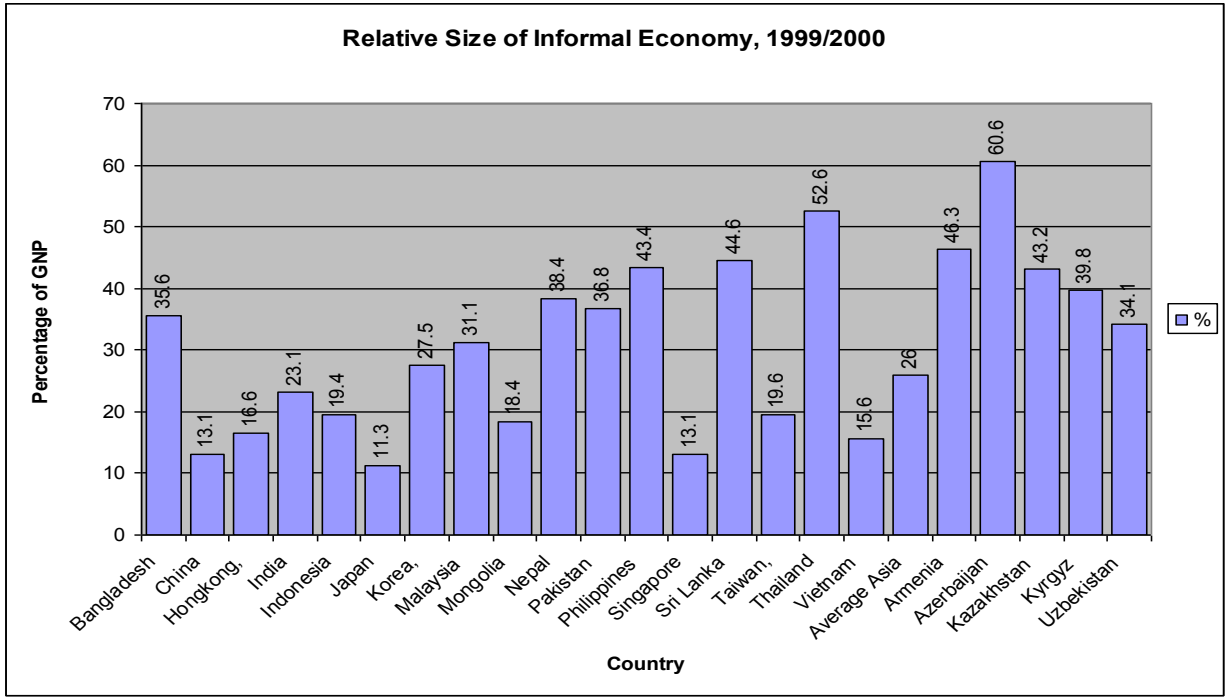
… Follow us on Twitter **@GCF_news**

amorrison@gcfund.org

GREEN
CLIMATE
FUND

Megacities and urbanization

City	Country	Population '000s 2005	Economic Product $m 2004
Shanghai	China	12,665	89,980
Mumbai	India	18,336	83,528
Jakarta	Indonesia	13,194	24,592
Manila	Philippines	10,677	32,277
Bangkok	Thailand	6,604	63,088
Tokyo	Japan	35,327	740,000
	Sweden	8,855	255,400
	Denmark	5,300	174,400
	Cambodia	13,107	26,990
	Bangladesh	136,600	56,600



If not properly managed, urbanization can increase pressure on energy and natural resources; increase pollution and production of greenhouse gas (GHG) emissions, which contribute to climate destabilization; and threaten ecosystems.

Recent 'Investing in Climate, Investing in Growth' report shows that bringing together the growth and climate agendas, rather than treating climate as a separate issue, could add 1% to average economic output in G20 countries by 2021 and lift 2050 output by up to 2.8%.

Challenge to Develop Sustainable Low Carbon Society

October 27, 2017, Thematic Meeting
The 6th ASIA SMART CITY CONFERENCE

Going for Green

Finetech
Going for Green

www.finetech.co.jp

YUSA
YOKOHAMA URBAN SOLUTION ALLIANCE

FINETEC: Head Office / Labo / Plant / Subsidy

Finetech
Going for Green

Head Office (Laboratory : Tokyo Institute of Technology)

W-105 Tokyo Institute of Technology YVP
4259-3, Nagatsuta-cho, Midori-ku, Yokohama, Kanagawa, Japan 226-8510
TEL: 81+ 0453097901 FAX: 81+ 0453097902
WEB: www.finetech.co.jp

Fukushima Renewable Energy Co., Ltd

Koriyama Incubation center-3
1-1, Tamuramachi Tokusada aza Nakakawara, Koriyama-shi, Fukushima, Japan
963-1165
TEL 81+ 0249436521

Aizu-wakamatsu Office
In FUKUSHIMA Pref.

Kita-kanto Green Plant

2969 Omata-cho, Ashikaga-shi,
Tochigi 326-0141, Japan
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FAX 81+ 0334337901

Finetech
Going for Green

Smart Green Park (Trademark of FINETECH)

Finetech
Going for Green

New Business Entity in collaboration with Yokohama City

Finetech
Going for Green

FINETECH Co., Ltd
as
the Board Member Company
of
YUSA
Under the Y-PORT Initiative

+

Wider Scope of
Global Sustainable Growth Scheme

II

- ADB's Development Fund
- GCF
  (Green Climate Fund)
- GPSC
  (Global Platform for Sustainable City)

"New Business Entity" established

Yokohama Urban Solution Alliance

YUSA
YOKOHAMA URBAN
SOLUTION ALLIANCE

- **Realize Y-PORT'S Initiative of Yokohama City**
- **Approach with Smart & Green Technology**
- **Provide Expertise of Urban Development**

Finetech
Going for Green

FINETECH's Strategic Framework for Low carbon Society

Strategic Framework

Low carbon Technologies providing for social needs and value

Factors to be considered

Factors to be considered

Business Portfolios

Policy

Industry

Mission & Vision: "Going for Green"

Renewable Energy

Energy Saving & Efficiency

New Material from Biomass

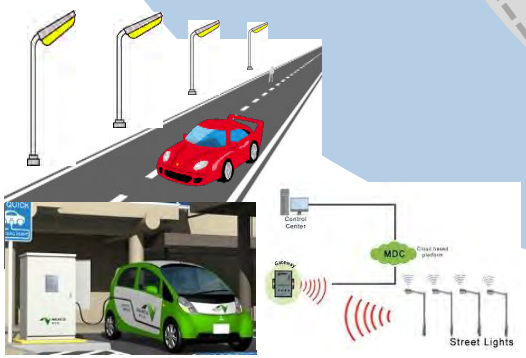
3 Key Areas prioritized & focused

Values

Market

Technology

Science



Finetech Going for Green

Inter-city Cooperation Activities with Yokohama City

Cities collaborated with Yokohama City

Philippine
Cebu City

Vietnam
Danang City

Thailand
Bangkok Metropolitan Administration (BMA)

Indonesia
Batam City / BIFZA

Y-PORT CENTER
Yokohama Urban Smart Solution

Business Matching in Bangkok

JCM and NEDO FS in Thai Approved FY2015

JCM Financial Support Scheme in Thai Approved FY2016

Business Meeting in Batam City

JCM FS in Batam Approved FY2015

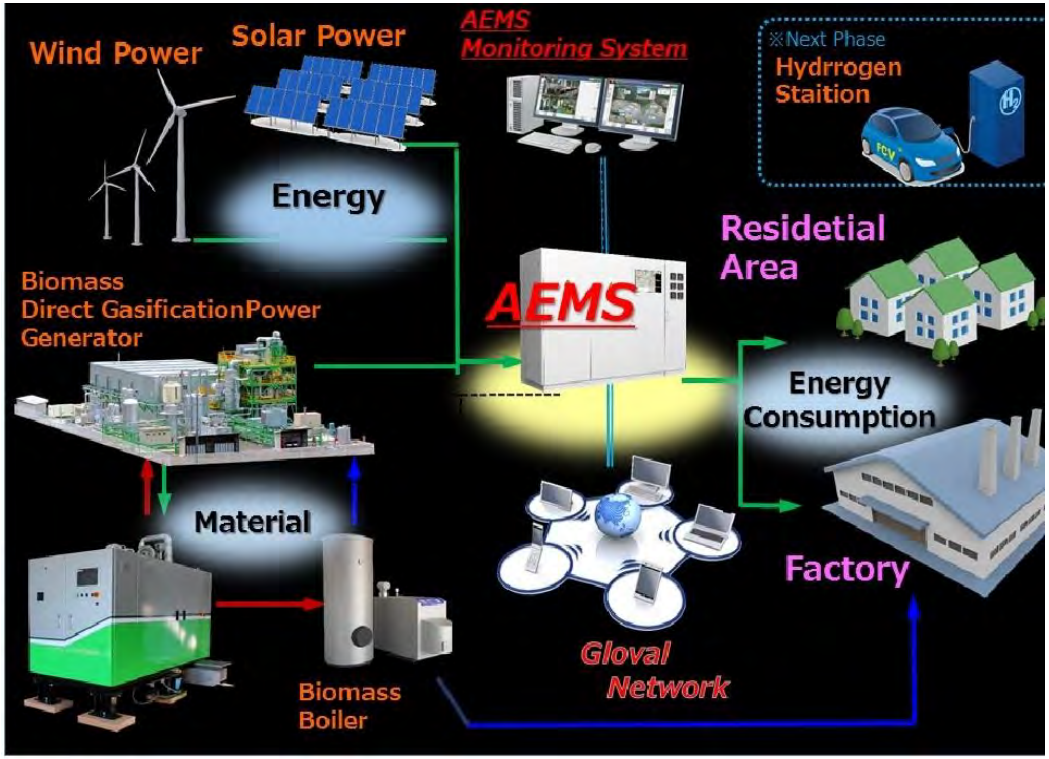
JCM FS Scheme in Batam Approved FY2016 / FY2017

Finetech
Going for Green

JCM Project in Thailand　2MW（Roof top Solar）with AEMS

➢ **FINETECH's Key Featuring Technology for Smart City Development**

>>>> Advance Energy Management System (AEMS)



- *Utilize Renewable Energy in Factory Site*
- *Utilize Renewable Energy in Regional Community in collaboration with the Grid Electricity*

TOA Paint Factory Site

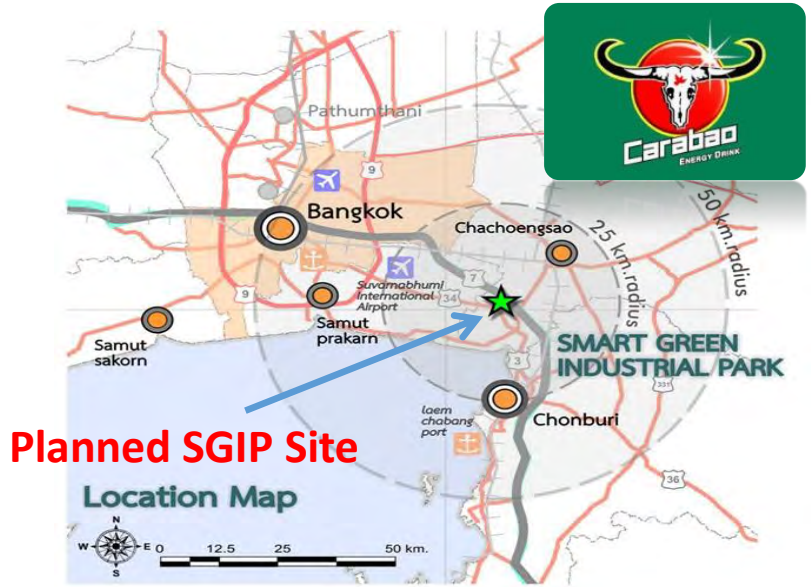
FEMS/Dema-res/Peak Control etc.

"Smart Green Innovation Park" Project
For the Leading Beverage Manufacturer in Thailand

➢ **Round Table Discussion with CARABAO hosted by Yokohama City Government**

- Date and Time: July 6, Wednesday, 2016
- Venue: Conference Room at Yokohama City Government

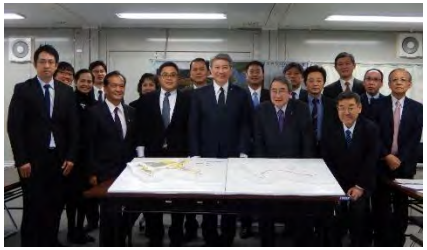
Mr. Sathien Setthasit, Chairman & CEO of Carabao Group PCL, and his management team, Yokohama City Government, and Royal Thai Embassy of Japan.



Finetech
Going for Green

25MW PV Solar Project with Thai Energy Conglomerate in Japan

Delegation from Thailand Embassy in Japan visited the Project Site AIZU-WAKAMATSU City / Fukushima Prefecture / Japan


His Exellency Mr.Bansarn Bunnag Ambassador of Thailand and Members of the Embassy

Collaboration with Indonesian Embassy in Japan for Consultation of Prioritization of Smart Project Candidate



His Excellency Dr. Yusron IHZA MAHENDRA Ambassador of Indonesia

Finetech
Going for Green

JCM Capacity Building Activities : OFFICIAL SITE VISIT

By ASEAN Cities' Officials under the City-to-City Cooperation

FINETECH received Global Delegations at the "FINETECH's SMART GREEN PARK" In line with the JCM Scheme

Delegation from BATAM

Smart Green Park

JCM F/S Steering Meeting with BIFZA Officials
in Batam, Indonesia, 2016

FINETECH was invited to a JCM Steering Meeting organized by Dr. Robert, Deputy Chairman of BIFZA, on December, 2016

Center: Dr. Robert / Deputy Chairman of BIFZA
Far Right: Mr. Memet / Head of Technical Planning of BIFZA
Second from Right: Mr. Iyus / Head of Waste Management of BIFZA
Third from Right: Mr. Binsar / Head of Environment of BIFZA
Third from Left: Mr. Zaiani / Batam City Government
Second from Left: Mr. Kurniawan / CEO of PT DESA AIR CARGO

JCM Key Findings of Smart Green Opportunities in Batam

JCM Scheme Opportunities through the Survey in FY 2015

Key Opportunity #1 : PV Solar Power Generation

- **PV Solar Farm System with Advanced Energy Management System for Utilization of Energy Supply at the Industrial Zone**
  planned site at PT DESA AIR CARGO

Key Opportunity # 2 : Oil Sludge Treatment

- **Replacement for High Efficiency Equipment of Oil Sludge Treatment Process in the Waste Management Industry**
  planned site at PT MEGA GREEN TECHNOLOGY

Key Opportunity # 3 : Spent Bleaching Earth Treatment

- **Utilization of palm oil refinery process in which residue oil are extracted from spent bleaching earth in the Palm Oil Refinery Industry**
  planned site at PT DESA AIR CARGO / PT Musim Mas

Smart Green Island BATAM Conceptual Mapping

Phase 1 / 2015 → Phase 2 / 2016 → **Phase 3 / 2017**

- Areas of Critical to Improvement and Development are Identified.
- Project Candidates are defined and shortlisted.
- Projects are consolidated into the created project mapping.

Green Transportation

Green Building

Green Industry

Green Waste

Green Water

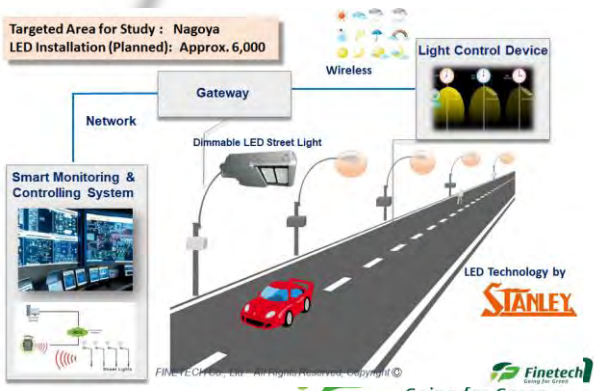
Green Planning

Explore Technology Implementation Opportunities

- **LED Street Lights**
- **LED Industry Areas**
- **LED Port Areas**

+

- **Smart Monitoring & Controlling System**



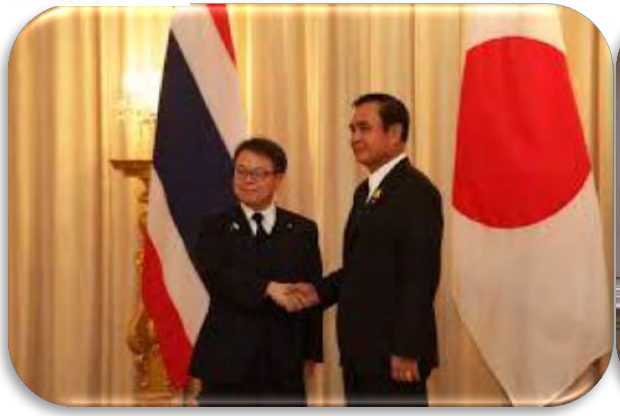
Finetech Going for Green

Development of Manufacturing System of PLANT-ORIGIN PLASTICS utilizing AI and IoT

➢ *MoU Exchanged*

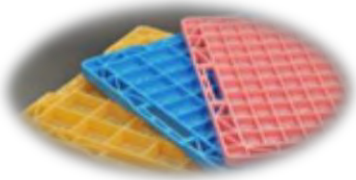
between FINETECH and N.R.NARONG GROUP

Occasion of the Japanese Economic Delegation to Thailand, September, 2017



MoU Singed and Exchanged on September 12, 2017 in the Witness of Dr. Pasu Loharjun, Director General of Department of Industrial Promotion / Ministry of Industry, Thailand.



Y-PORT WORK SHOP

THAILAND INDUSTRY 4.0

EEC：Eastern Economic Corridor

Thai Ministry of Energy
Director General
Mr. Twarath Sutabutr SC.D

Yokohama Urban Solution Alliance【YUSA】

AMATA
Chairman Mr. Vikrom Kromadit

Going for Green

the way we work…

www.finetech.co.jp

Finetech
Going for Green

Smart City Model Development
Bandung Indonesia Case Study

Smart City Living Open Innovation lab

sccic
Smart City & Community Innovation Center

What is Smart City

Kota yang dapat mengelola berbagai sumberdayanya secara efektif dan efisien untuk menyelesaikan berbagai tantangan kota menggunakan solusi inovatif, terintegrasi, dan berkelanjutan untuk menyediakan infrastruktur dan memberikan layanan-layanan kota yang dapat meningkatkan kualitas hidup warganya.

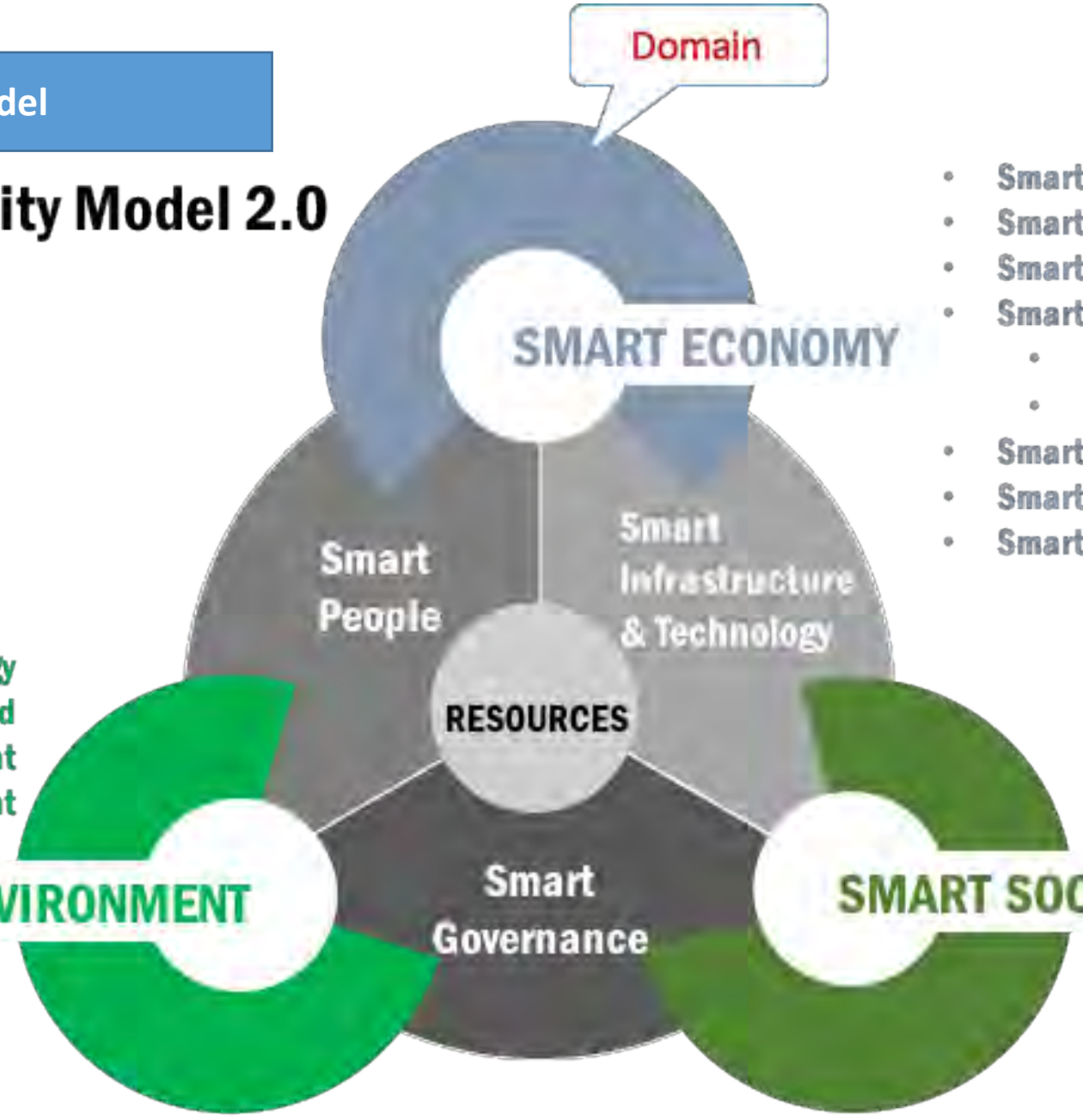
"City that have good capability to manage all resources effectively and efficient to solve all city problem using innovative, integrated, and sustainable solution by giving basic infrastructure and good city services to improve Quality of Life of its Citizen."

Smart City Model

Garuda Smart City Model 2.0

Enabler

Process



Cluster

- Smart Industry
- Smart Small Business
- Smart & Creative Startup
- Smart Tourism
  - Layanan 1
  - Layanan 2

Service

- Smart Maritime
- Smart Transport
- Smart Payment & Banking

- Smart Energy
- Smart Water/Air/Land
- Smart Waste Management
- Smart Region Management

- Smart Health
- Smart Education
- Smart Government (Public Services)
- Safe & Secure
- Smart Generation

SCCIC

Smart City & Community Innovation Center

Building Energy Management

Manajemen Energi di Bangunan

Kepala Lab. Manajemen Energi Teknik Fisika ITB
Edi Leksono, Ir. MEng., Dr.
Email : edi @tf.itb.ac.id

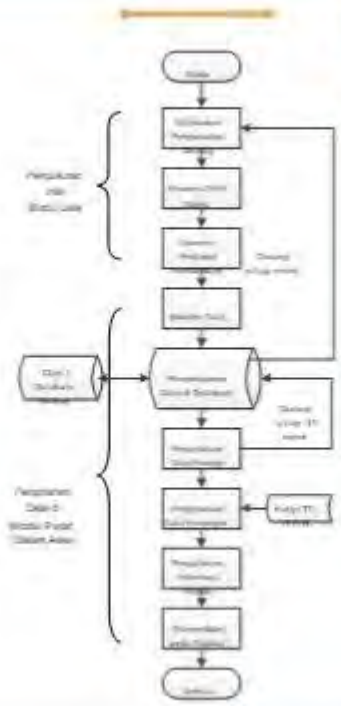
Latar Belakang

- Dengan adanya sistem manajemen energi listrik (SiMeli), peluang peningkatan efisiensi energi listrik dapat diterapkan, diantaranya dengan mengubah kebijakan operasi sarana prasarana bangunan, melakukan penjadwalan perangkat baik secara manual ataupun otomatis, melakukan pengaturan untuk menyeimbangkan beban ketiga fasa, ataupun dapat diketahui juga mana peralatan-peralatan yang boros konsumsi energi listrik pada suatu gedung bahkan mungkin dapat menggunakan sistem otomasi bangunan.
- Pada sebuah bangunan, umumnya pemanfaatan listrik selain untuk penerangan adalah untuk *air conditioner (AC)* dimana merupakan salah satu perangkat dengan konsumsi energi listrik yang cukup besar. Efisiensi penggunaan AC Sentral maupun AC–Split bisa dilakukan dengan peningkatan kemudahan akses dan konektivitas melalui teknologi SCADA berbasis *Internet of Things* (IoT), dimana sistemnya dapat diintegrasikan dengan pengukuran energi listrik dan pemantauan kondisi termal sebuah ruangan.
- Untuk itulah diperlukan sebuah sistem yang dapat mengintegrasikan sistem monitoring dan controlling perangkat kelistrikan untuk keperluan manajemen energi, yang dapat diakses secara mudah, kapan pun dan dimanapun melalui jaringan internet.

Kata Kunci

Manfaat

- Untuk mengendalikan konsumsi energi agar tercapai pemanfaatan energi yang efektif dan efisien untuk menghasilkan keluaran yang maksimal dan meminimalkan bahan baku atau bahan pendukung.
- Observability : menyediakan informasi mengenai listrik baik kepada pengguna ataupun produsen listrik Dengan demikian akan terjadi kondisi *electricity awareness. Contoh : Intensitas Konsumsi Energi (IKE), profil konsumsi energi, power quality*
- Controllability : komponen-komponen sistem yang memungkinkan untuk di kontrol berdasarkan informasi yang diperoleh. Contoh : *Kontrol AC sentral / split, lampu, electricity appliances*
- Consequences analysis : menggunakan informasi yang berguna untuk diolah dan dianalisis dan keputusannya digunakan untuk merespon sesuatu. Contoh : *thermal comfort index, audit energi , energy financial planning*



Model Arsitektur Sistem

Implementasi

Energy Management & Lighting Control
Gedung Labtek XIV – SBM ITB

Gedung Labtek V, VI, VII, VIII, ITB

Lab.. Manajemen Energi,
Teknik Fisika ITB,

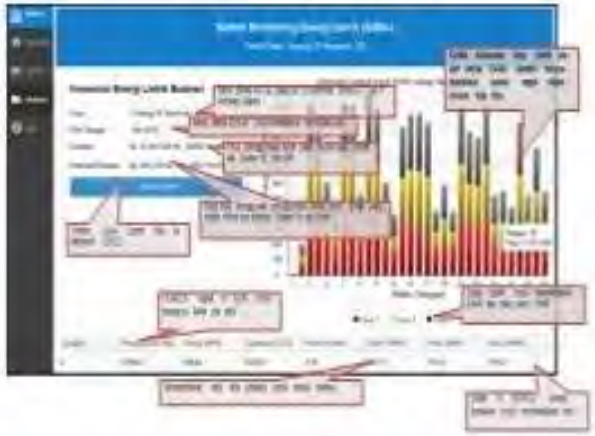
Instalasi Smart Meter & Remote
Control System

Pengembangan perangkat lunak untuk Sistem Manajemen Energi Listrik (SiMeli), Teknik Fisika ITB

Sistem Informasi Energi Listrik (SiElis)
Tampilan Beranda Software

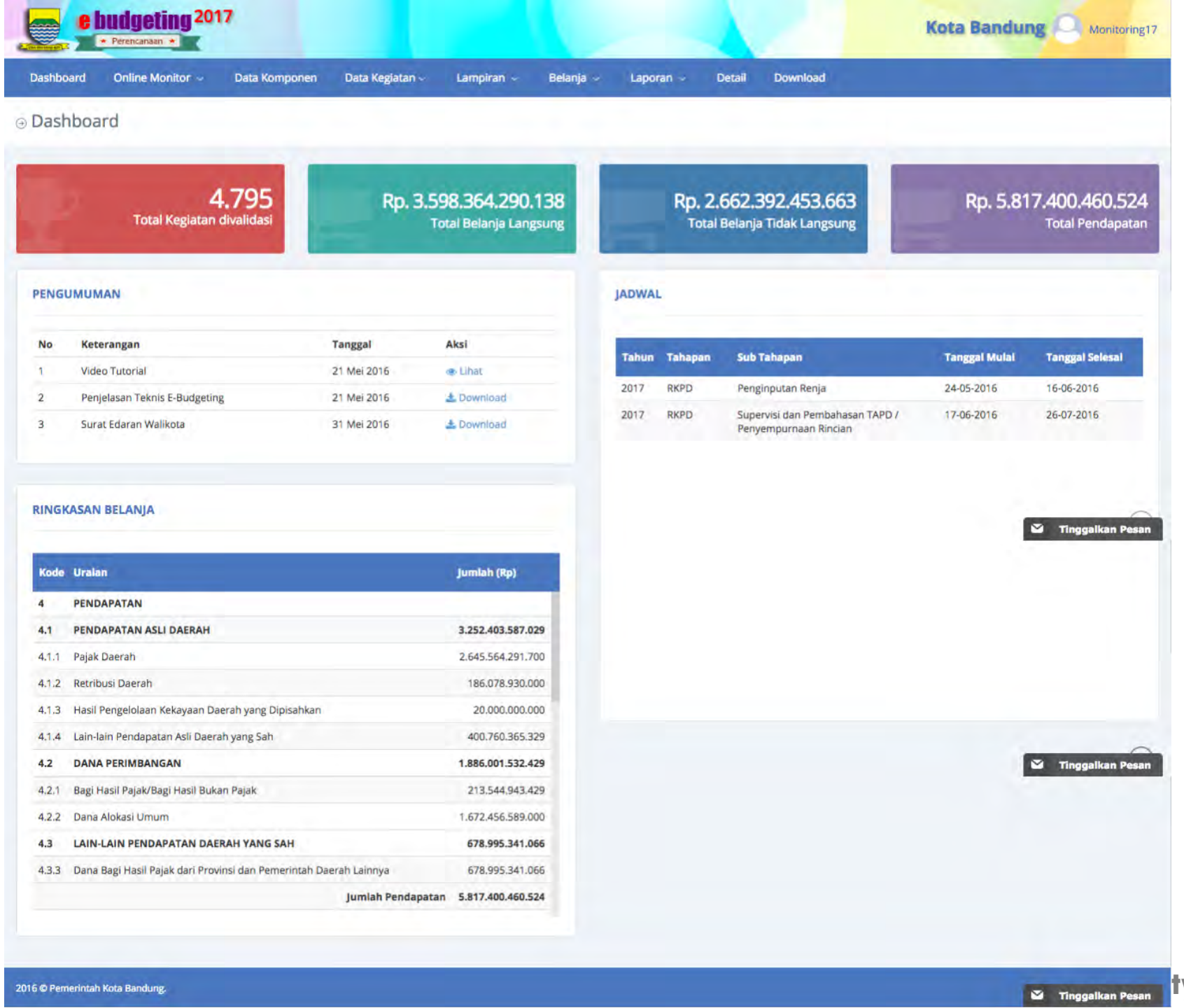
Profil harian - konsumsi energi dan kualitas energi
Gedung Labtek, V, VI, VII, VIII, - ITB,

Monitoring dan Kontrol AC dan Lampu
Lab. Manajemen Energi, Teknik Fisika ITB,



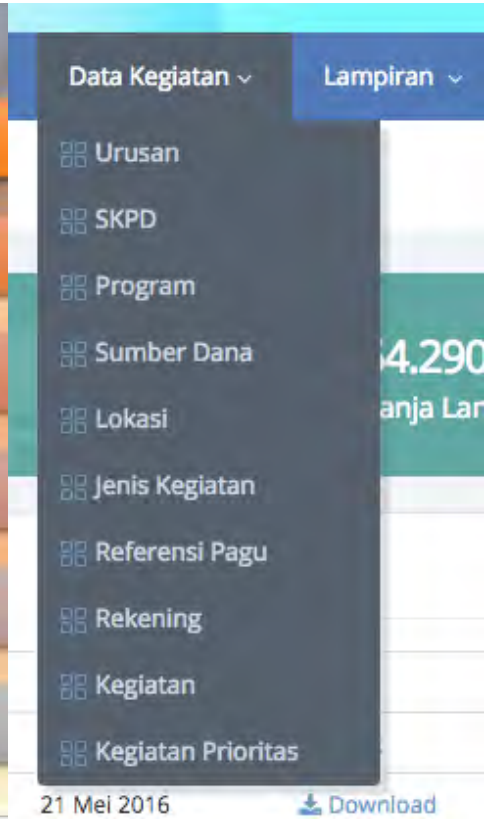
Analisis bulanan – finansial dan audit energi bangunan
Gedung Labtek, V, VI, VII, VIII, - ITB,

E-BUDGETING



MANFAAT SISTEM E-PLANING & E-BUDGETING YANG TERINTEGRASI

- Tereliminasi Duplikasi Anggaran
- Tidak ada kegiatan yang tidak direncanakan
- Nilai anggaran kegiatan lebih terukur
- Berkurangnya komponen belanja pendukung kegiatan
- Digunakannya standarisasi kegiatan dan harga
- Lebih mudah mengendalikan dan melakukan analisa



E-RK
（Performance Based Renumeration）

.bdg E-RK MANFAAT E-RK

.bdg E-RK MANFAAT E-RK

MERUBAH BUDAYA KERJA

MENGIDENTIFIKASI PEGAWAI

DAPAT MENGUKUR BEBAN KERJA PEGAWAI

.bdg E-RK RUANG LINGKUP PENILAIAN (VARIABEL PENGUKURAN)

AKTIVITAS

SERAPAN ANGGARAN

IKI

INOVASI

PERILAKU

IKU

IKP

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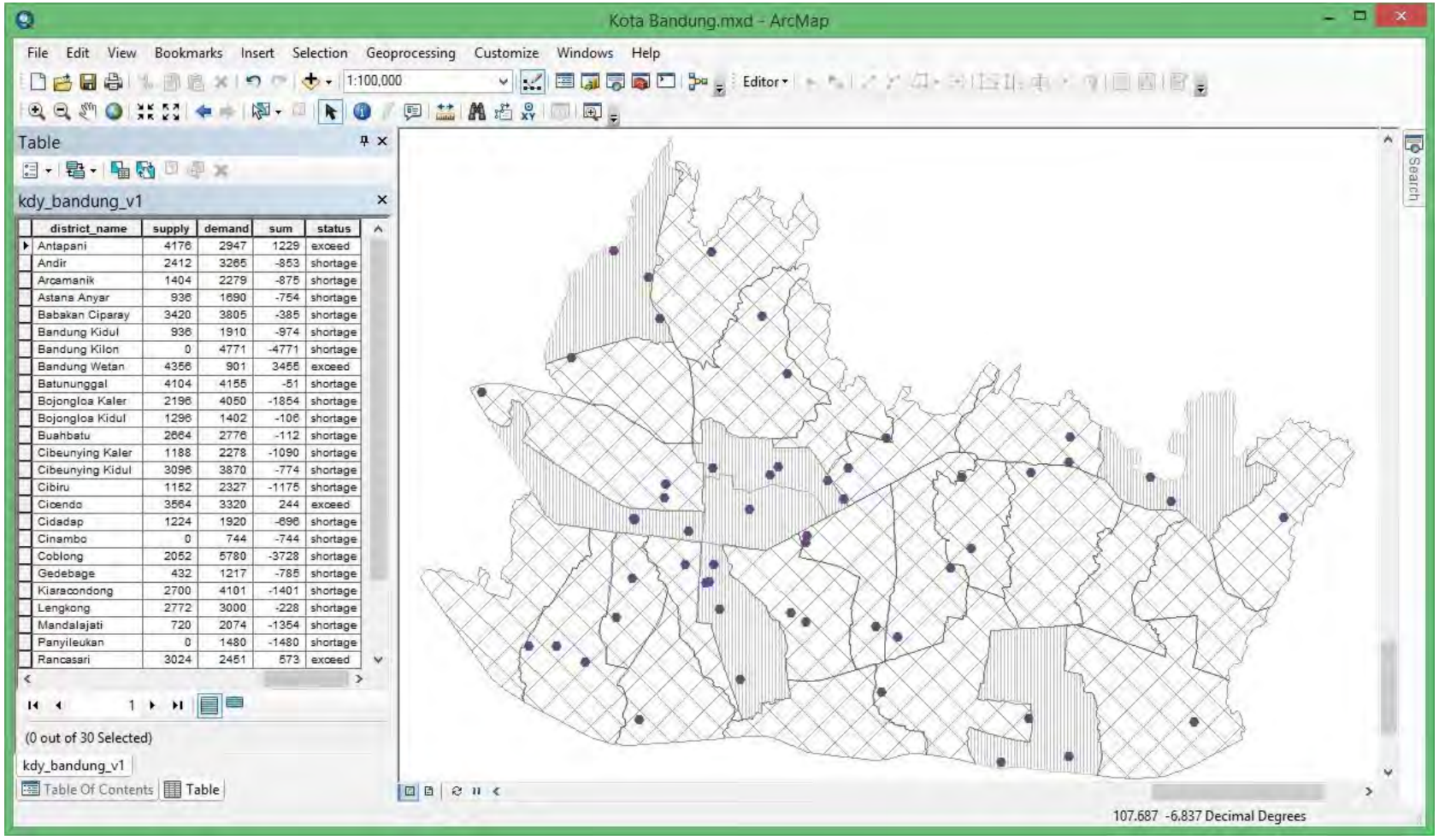
Research

Optimization of School Network using Location-Allocation Analysis (Case Study: Bandung City)

M. R. Alifi, H. Hayati, S. H. Supangkat, IEEE Tensymp 2017, Kochi, Kerala, India

Riset #2: Optimization of School Network using Location-Allocation Analysis (1/4)



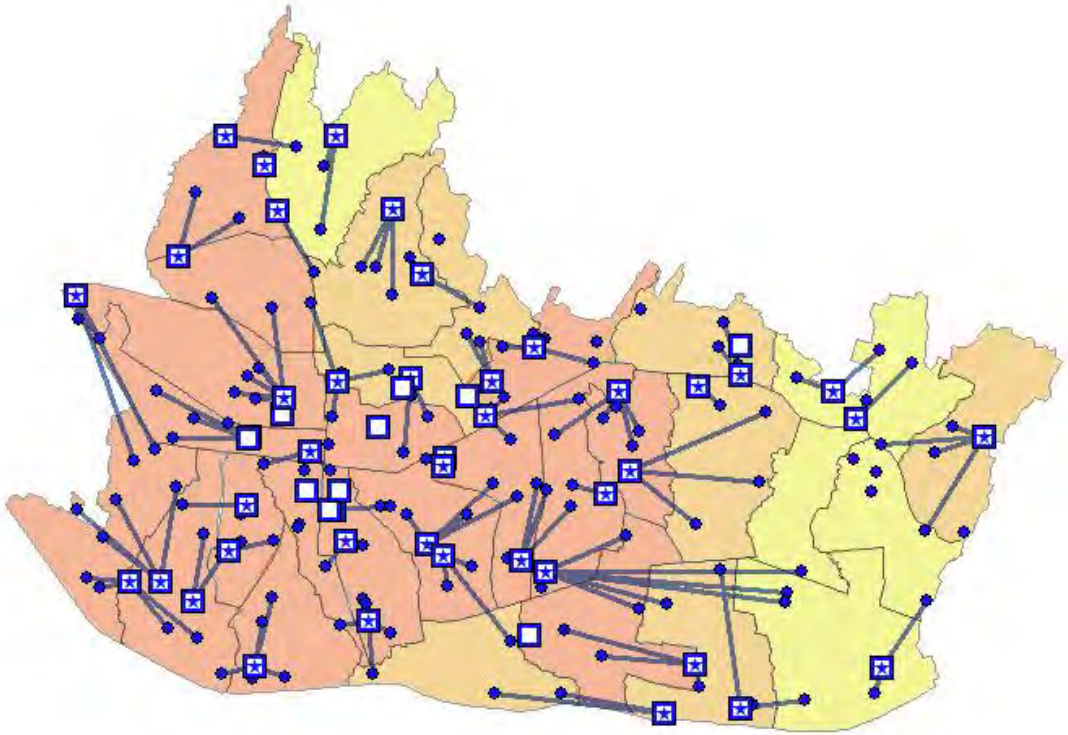
district_name	supply	demand	sum	status
Antapani	4176	2947	1229	exceed
Andir	2412	3265	-853	shortage
Arcamanik	1404	2279	-875	shortage
Astana Anyar	936	1690	-754	shortage
Babakan Ciparay	3420	3805	-385	shortage
Bandung Kidul	936	1910	-974	shortage
Bandung Kilon	0	4771	-4771	shortage
Bandung Wetan	4356	901	3455	exceed
Batununggal	4104	4155	-51	shortage
Bojongloa Kaler	2196	4050	-1854	shortage
Bojongloa Kidul	1296	1402	-106	shortage
Buahbatu	2664	2776	-112	shortage
Cibeunying Kaler	1188	2278	-1090	shortage
Cibeunying Kidul	3096	3870	-774	shortage
Cibiru	1152	2327	-1175	shortage
Cicendo	3564	3320	244	exceed
Cidadap	1224	1920	-696	shortage
Cinambo	0	744	-744	shortage
Coblong	2052	5780	-3728	shortage
Gedebage	432	1217	-785	shortage
Kiaracondong	2700	4101	-1401	shortage
Lengkong	2772	3000	-228	shortage
Mandalajati	720	2074	-1354	shortage
Panyileukan	0	1480	-1480	shortage
Rancasari	3024	2451	573	exceed

District School Sufficiency
This Figure shows that the school sufficiency in Bandung still imbalance. The imbalance of school supply and demand implicate the high mobility of student to school because student from area with shortage school have to choose school in other area.

Ref: Alifi et al, 2017

Riset #2: Optimization of School Network using Location-Allocation Analysis (4/4)

- Recommendation
  - From the established network illustrated in Figure, a recommendation of reducing school capacity in 11 districts, adding school capacity in 2 districts, and constructing new schools in 13 districts is produced. 4 other districts have had sufficient schools.



Ref: Alifi et al, 2017

BDG SMART SCHOOL

sccic
Smart City & Community Innovation Center

Teacher Should Focus on Teaching not Paper Work

Guru terlalu disibukkan dengan pekerjaan-pekerjaan administratif.

Seperti : memeriksa tugas, ujian, merekap nilai dll

SMART EDUBOX
Ujian dalam Jaringan & LMS Tanpa Internet

Contoh Implementasi

Implementasi di SMKN 2 Bandung

Ujian Sekolah Dalam Jaringan (USDJ)

Try Out Ujian Nasional

BENEFIT

Manfaat Untuk Sekolah

Efisiensi Biaya dan Waktu

Diasumsikan satu pelajaran membutuhkan 5 lembar kertas dengan 1000 orang siswa dan 17 mata pelajaran

340.000 lembar kertas/tahun = Rp 51.000.000

Penghematan waktu guru untuk melakukan **pemeriksaan ujian dan pembuatan rapor. Tidak ada lagi tumpukan kertas ujian dan buku tugas**

~~1 Minggu~~ /guru

Manajemen data rapi

Semua data siswa tercatat dengan baik dalam sebuah management data sehingga dengan mudah bisa dicari sampai 10 tahun kebelakang

Tranparansi dan akuntabel dalam proses belajar mengajar di sekolah. Kepala sekolah dengan mudah bisa memberikan penilaian yang adil untuk kinerja guru. Anak-anak pun mendapatkan hasil sesuai dengan usaha mereka