



Bangkok: The Open Opportunities for Water, Wastewater and Waste Managements

DEPARTMENT OF DRAINAGE AND
SEWERAGE

BANGKOK METROPOLITAN
ADMINISTRATION



Bangkok Water Resource Management Plan and Policy

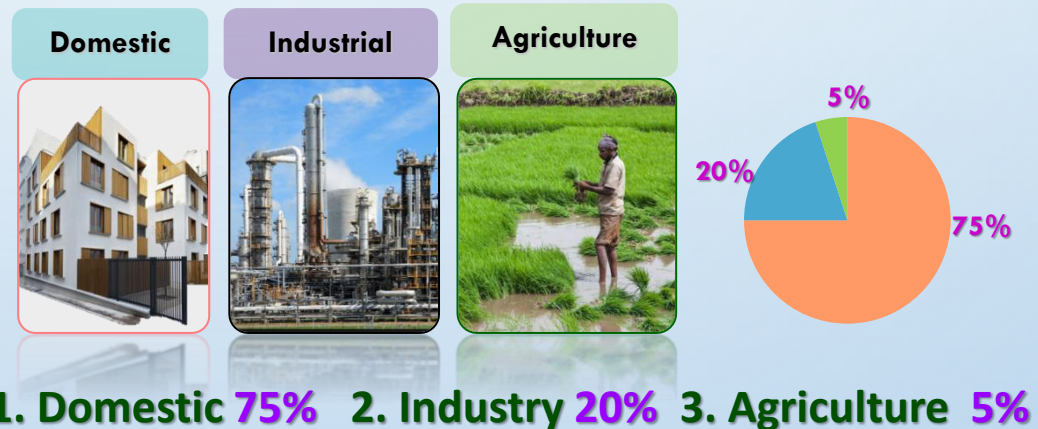


GENERAL INFORMATION OF BANGKOK



- **Bangkok : Area 1,568.74 km² (Inner 266.77, Middle 426.20, Outer 875.77) , Precipitation per year 1400-1600 mm**
- **Surface Water: Canal 1,980 canals Length 2,745 km**
- **Chao Praya River 372 km (Total Length) Bangkok 35 km**
- **Source of Water Supply to Bangkok and vicinity: Upstream of Chao Praya River at Sam Lae, Pathum Thani**
- **Water Consumption (2021) : 2.386 mil.m³/day**

• Major Sources of Wastewater



BMA'S GOVERNOR POLICIES

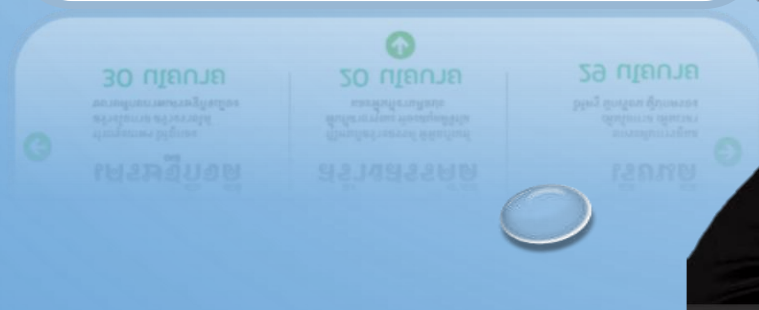


Good Environment

Installation of community wastewater treatment system

Installation of Wastewater Treatment System at **the Source**

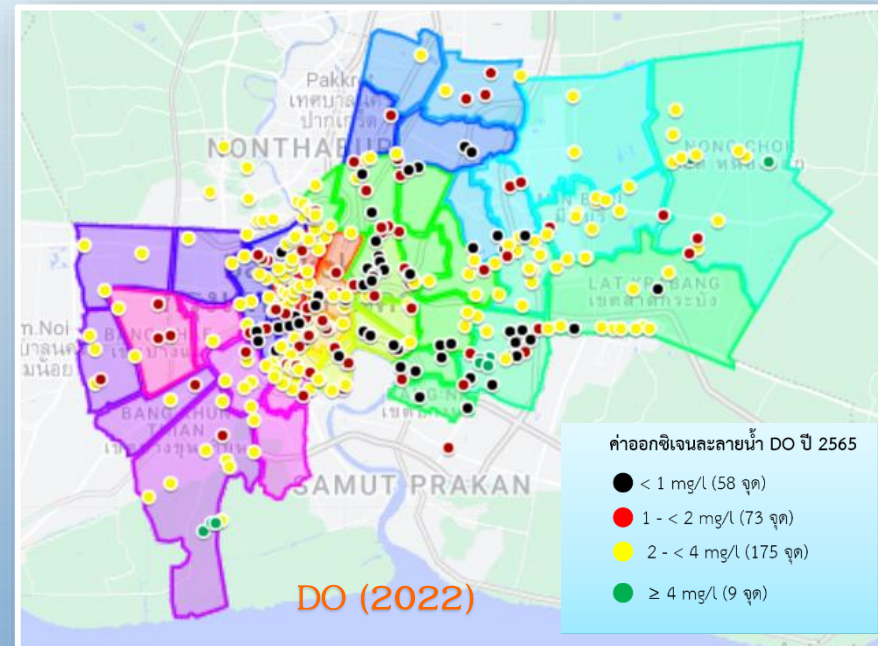
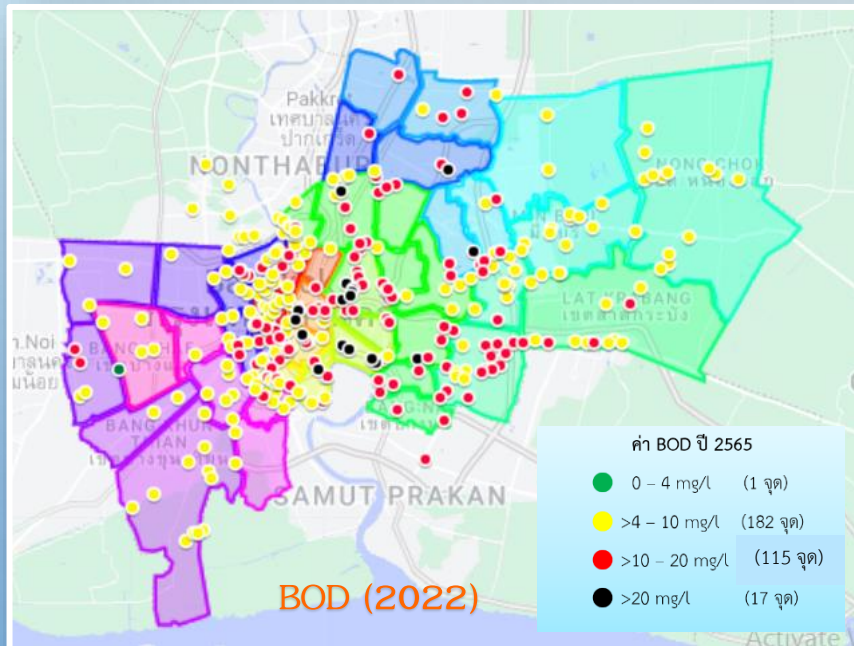
Revising the construction plans for wastewater treatment plants and the existing sewerage systems



GENERAL INFORMATION OF BANGKOK

Water Quality Monitoring Program in Bangkok

- **315** Sampling Points (169 major canals and 1 pond) and **9** Sampling Points in Chao Praya River
- The BOD and DO of 315 sampling points are **highly polluted**

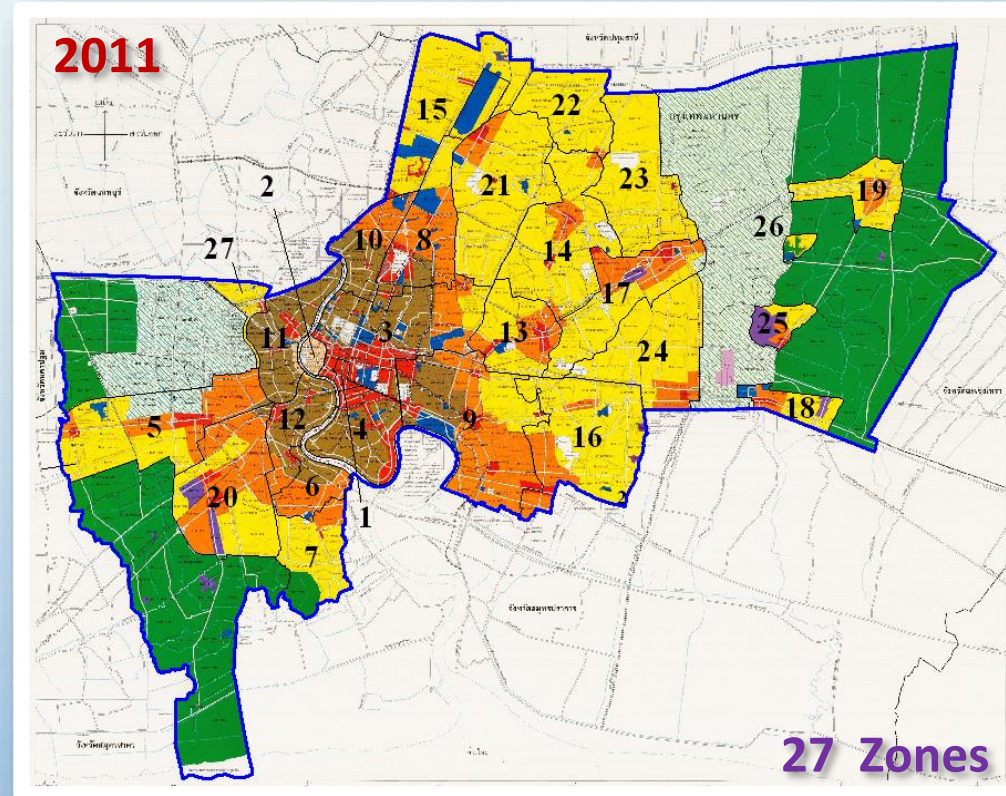
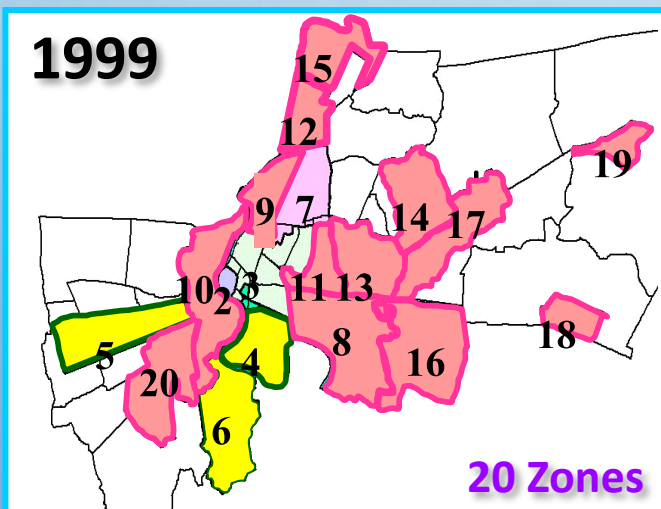
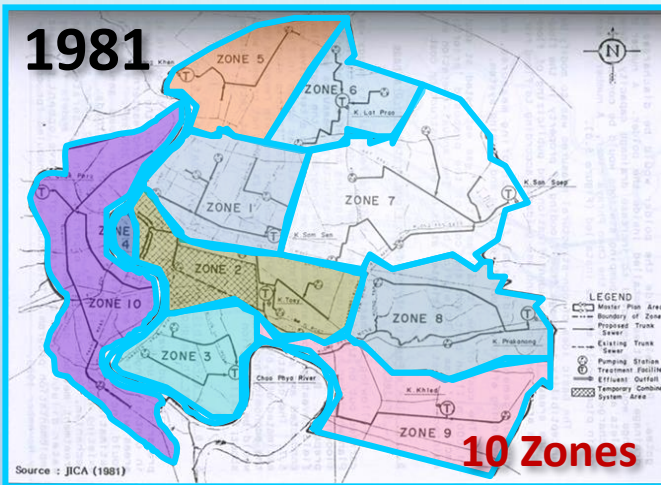




Policy and Plan of water , wastewater and waste managements in Bangkok



MASTER PLAN



In 2011, Bangkok in collaboration with JICA has proposed a 30-year master plan for Bangkok to construct the wastewater treatment . The construction area is divided into 27 areas of wastewater treatment cover 80-90% of total wastewater generated in Bangkok

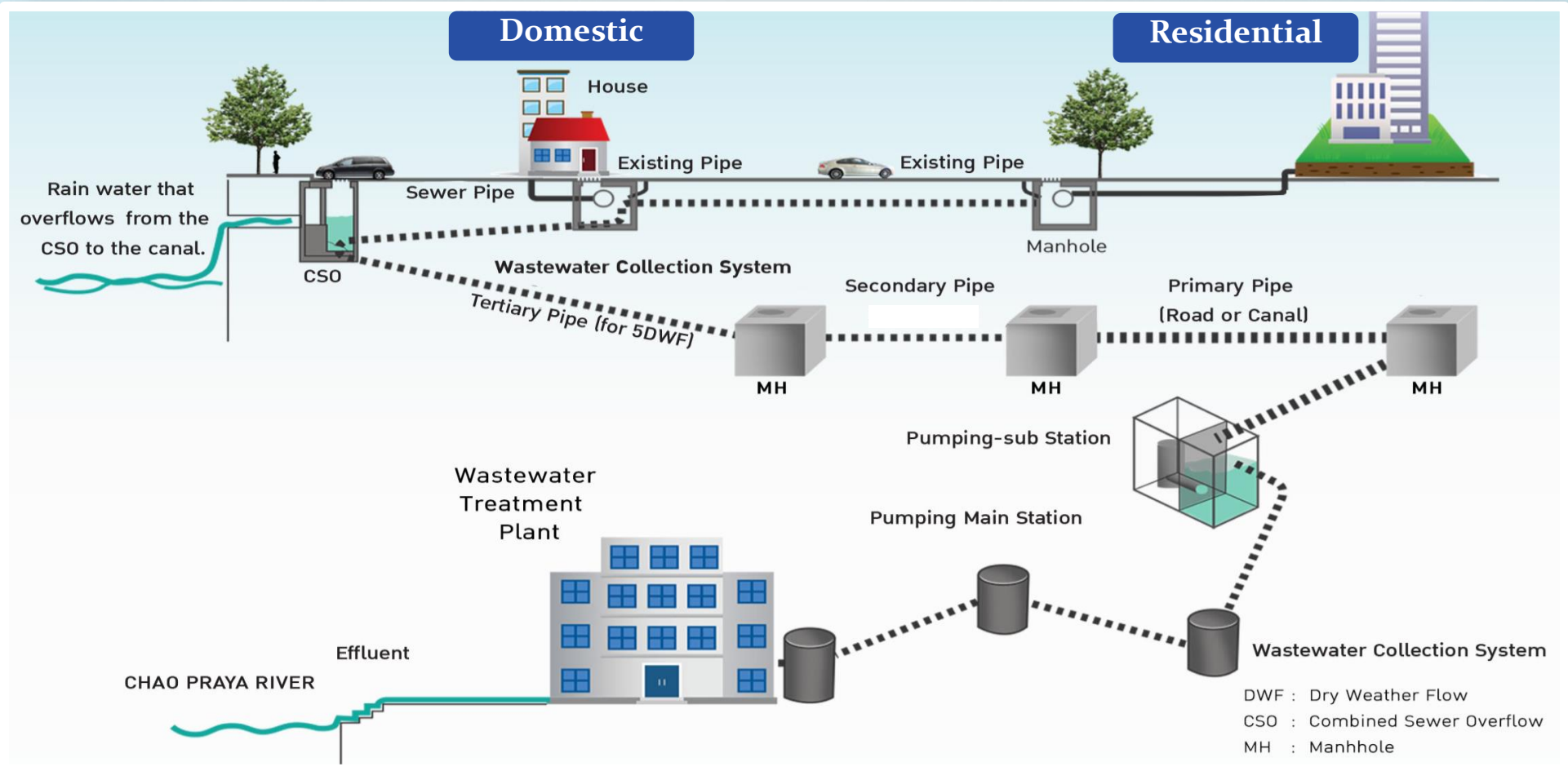
WASTEWATER TREATMENT SYSTEMS

1. **Central Wastewater treatment System**
2. **Community Wastewater treatment System**
3. **Cluster Wastewater treatment System**
4. **Onsite Wastewater treatment System**



Base on the regulation
“the Building Control Act, B.E. 2522 (1979)”
Septic Tank

PRINCIPLE OF WASTEWATER COLLECTION



EXISTING CENTRAL WWTPs



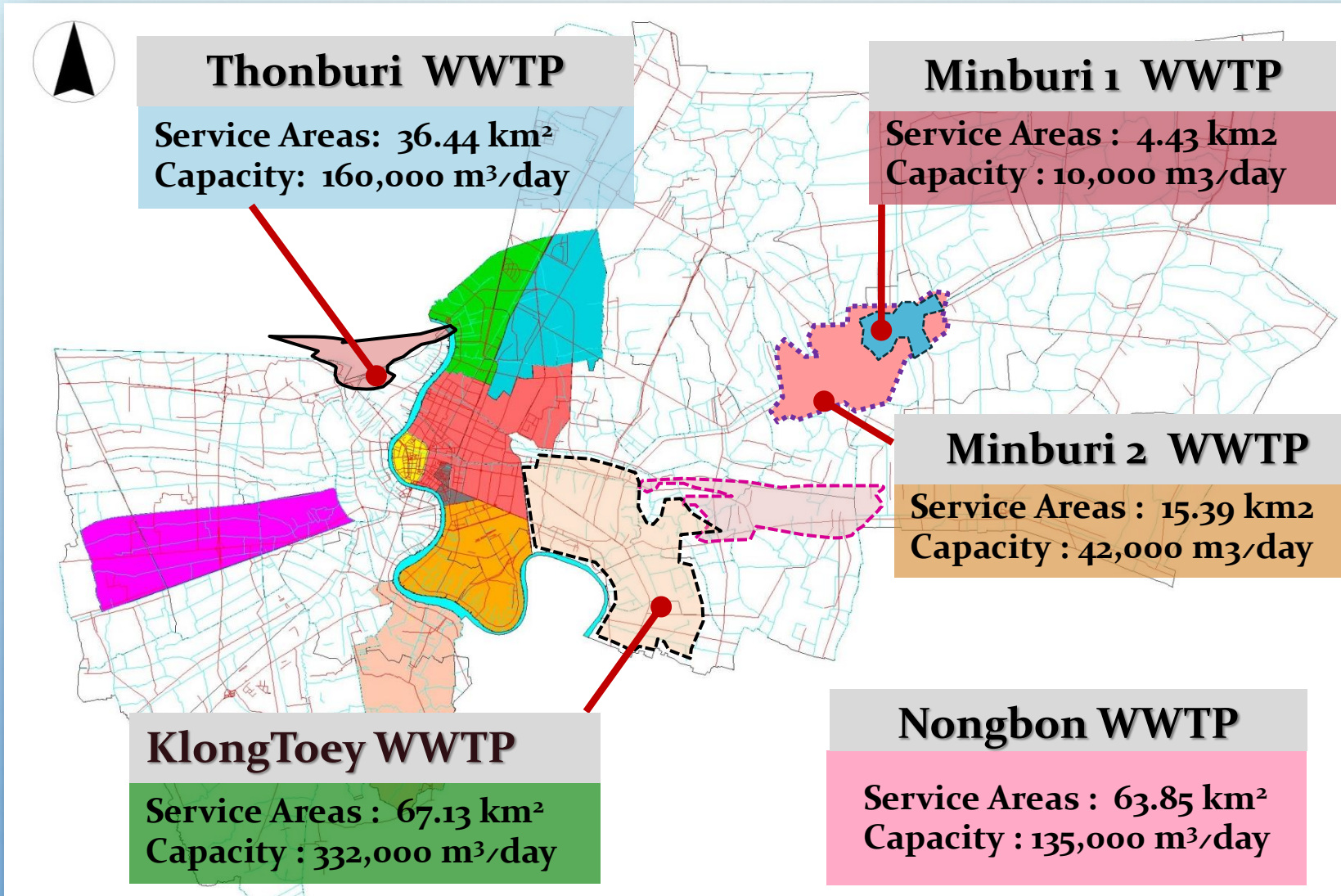

14% of Total Area
45% of Wastewater Generation

Wastewater Plant	Population Served	Service Area (sq.km.)	Capacity (m ³ /d)	Operation Year
1. Si Phraya	120,000	2.7	30,000	1994
2. Rattanakosin	70,000	4.1	40,000	2000
3. Chong Non Si	580,000	28.5	200,000	2000
4. Nong Khaem	520,000	44	157,000	2002
5. Tung Kru	177,000	42	65,000	2002
6. Din Dang	1,080,000	37	350,000	2004
7. Chatu Chak	432,000	33.4	150,000	2005
8. Bangsue EECC	223,990	23.97	120,000	2013
Total	3,202,990	215.67	1,112,000	

EFFLUENT STANDARDS

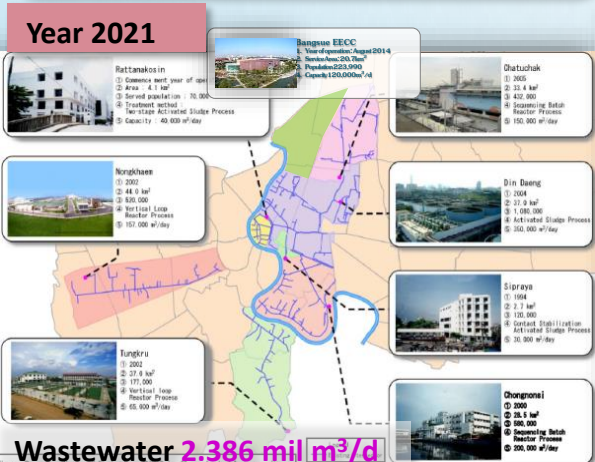
1. Biochemical Oxygen Demand (BOD) < 20 mg/l
2. SS < 30 mg/l
3. Total Nitrogen < 10 mg/l
4. Ammonia Nitrogen < 5 mg/l
5. Total Phosphorus < 2 mg/l
6. Dissolved Oxygen (DO) \geq 5 mg/l
7. Fat, Oil and Grease < 5 mg/l
8. pH 5.5 - 9.0

FUTURE SCHEME OF WWTPs



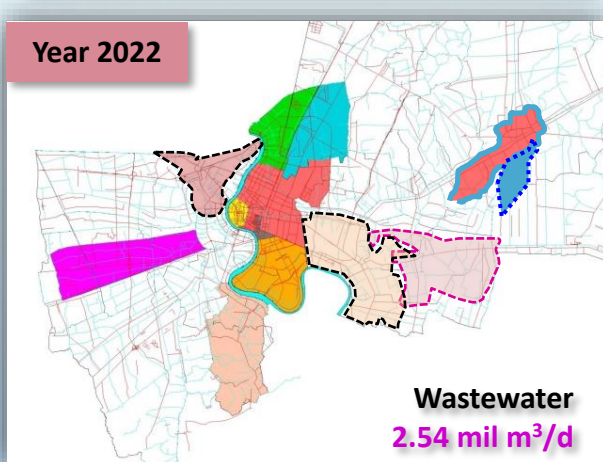
EXISTING PROJECTS AND FUTURE PLAN

8 WWTPs under O&M



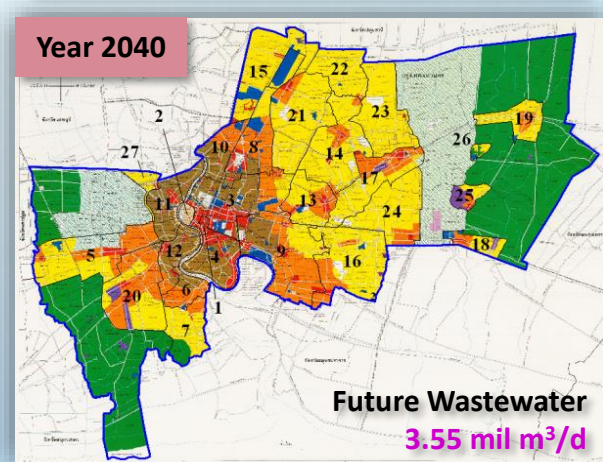
- Capacity 1.112 mil m³/d
- **46.59% of WW generation**
- Construction Cost 26,578 MB (~ 769 mil. USD)
- O&M Cost 626 mil. Baht/year (~18.12 mil. USD)

5 WWTPs Implementation



- Capacity 0.679 mil m³/d (Total Capacity 1.791 mil m³/d)
- **70% of WW generation**
- Construction Cost 29,903.97 MB (~865.78 mil. USD)
- O&M Cost 496 mil. Baht/year (~ 14.36 mil. USD)

14 WWTPs in Future Plan



- Capacity 1.631 mil m³/d (Total Capacity 3.422 mil m³/d)
- **96% of WW generation**
- Construction Cost 71,033 MB (~2,056 mil. USD)
- O&M Cost 1,190 mil. Baht/year (~34.45 mil. USD)

Exchange rate : 34.54Baht/US dollar (March 8, 2023)

WASTEWATER TARIFF

- **BMA Wastewater Tariff Regulation B.E.2547 (2004)**
- **Revise of BMA Wastewater Tariff Regulation B.E.2562 (2019)**
- **Notification under Wastewater Tariff Regulation**
- **Preparing the database and the computer system for collecting the wastewater Tariff**
- **MOU between BMA and MWA**
- **Public Relation**



No. of District	22
Area Coverage (Km ²)	192

1. Si Phraya WWTP	5. Tung Kru WWTP
2. Rattanakosin WWTP	6. Din Dang WWTP
3. Chong Non Si WWTP	7. Chatu Chak WWTP
4. Nong Khaem WWTP	8. Bangsue EECC

WASTEWATER TARIFF

80% of water supply usage

Group 1 :
Household/Residential



2 Baht/m³

Group 2 :
**Government Sector, Real Estate, Office,
Religion Place, Foundation,
Education Organization, Hospital
and Commercial**



4 Baht/m³

Group 3 :
**Hotel, Industry, Shopping Mall, and
Department Store**

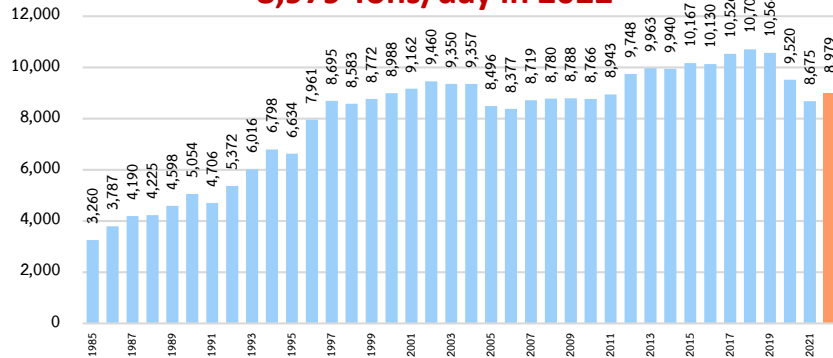


8 Baht/m³

Solid Waste Management in Bangkok

Solid Waste Amount in Bangkok (Ton/day)

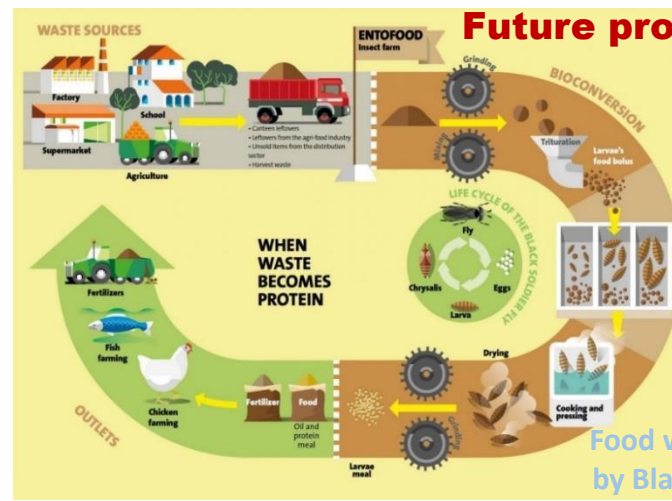
8,979 Tons/day in 2022



Waste Composition



Composting Plant 1,600 tons/day



Project "Mai Te Ruam" (No Mixed Waste)



Composting at District Office



Animal Feed



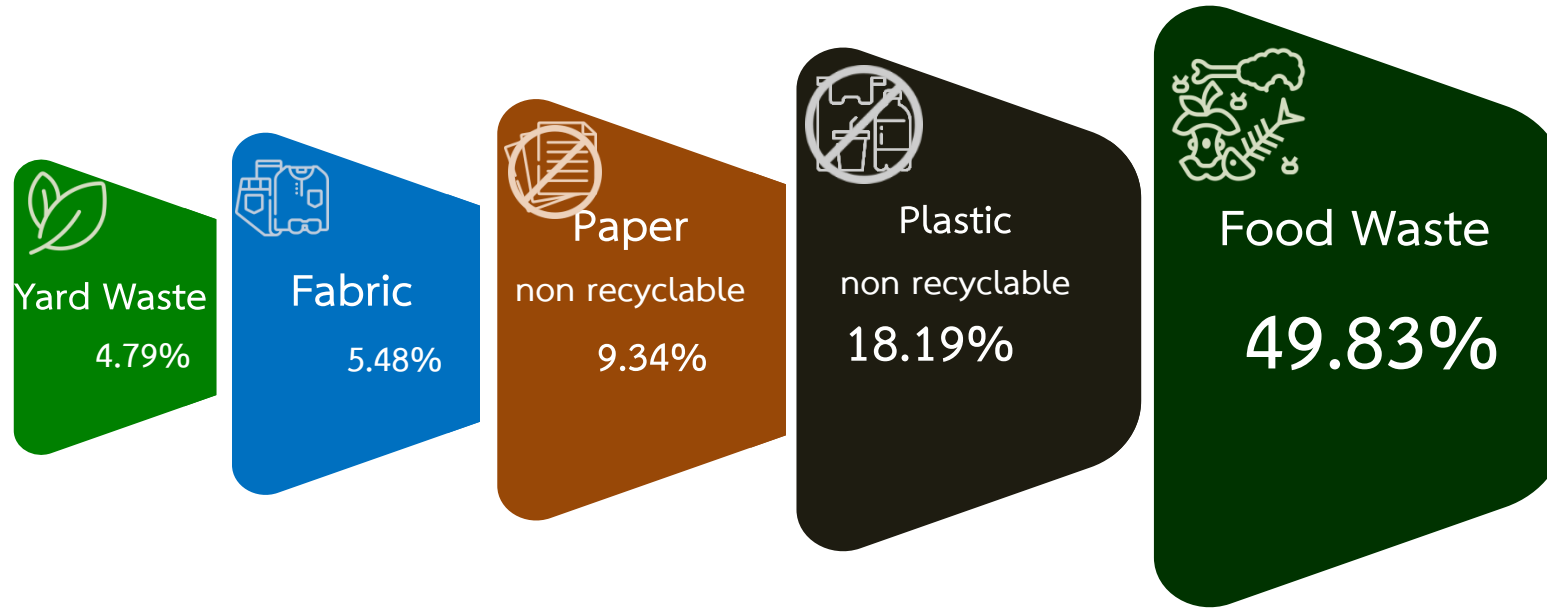
Food Waste Management by BSF

Recycle food waste to alternative protein (Animal feed), to reduce waste to incineration and landfill

Black Soldier Fly (BSF)

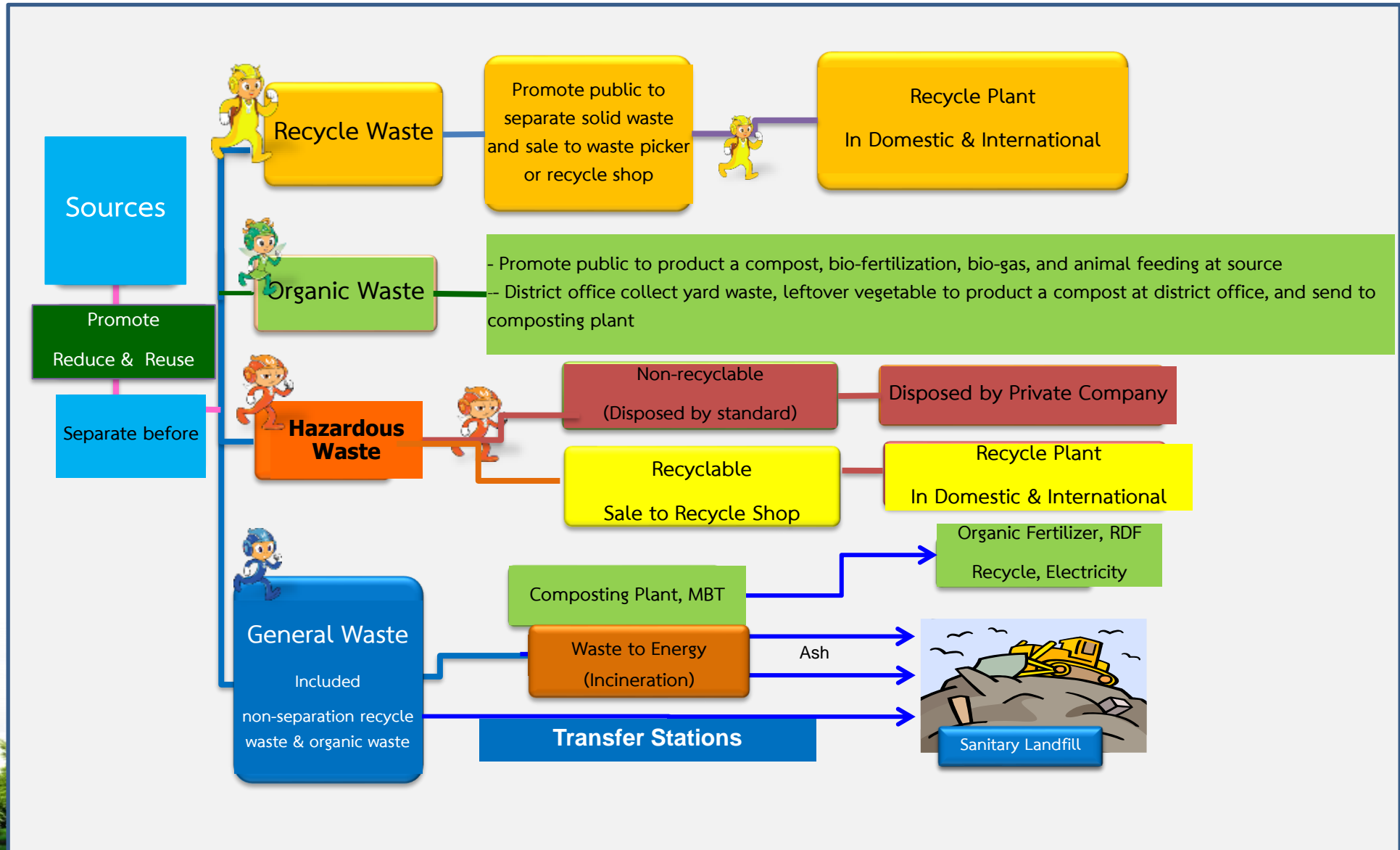


WASTE COMPOSITION in BANGKOK (2022)



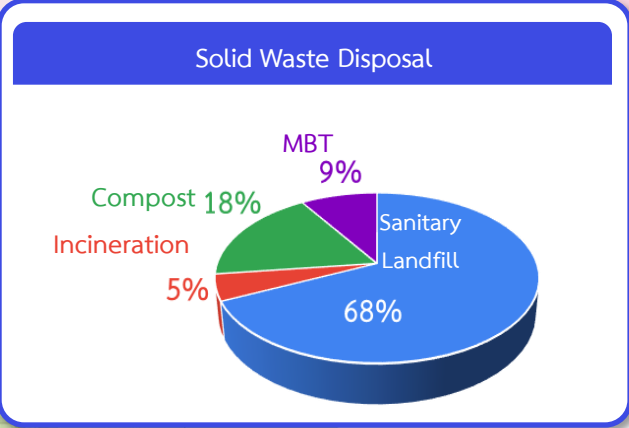
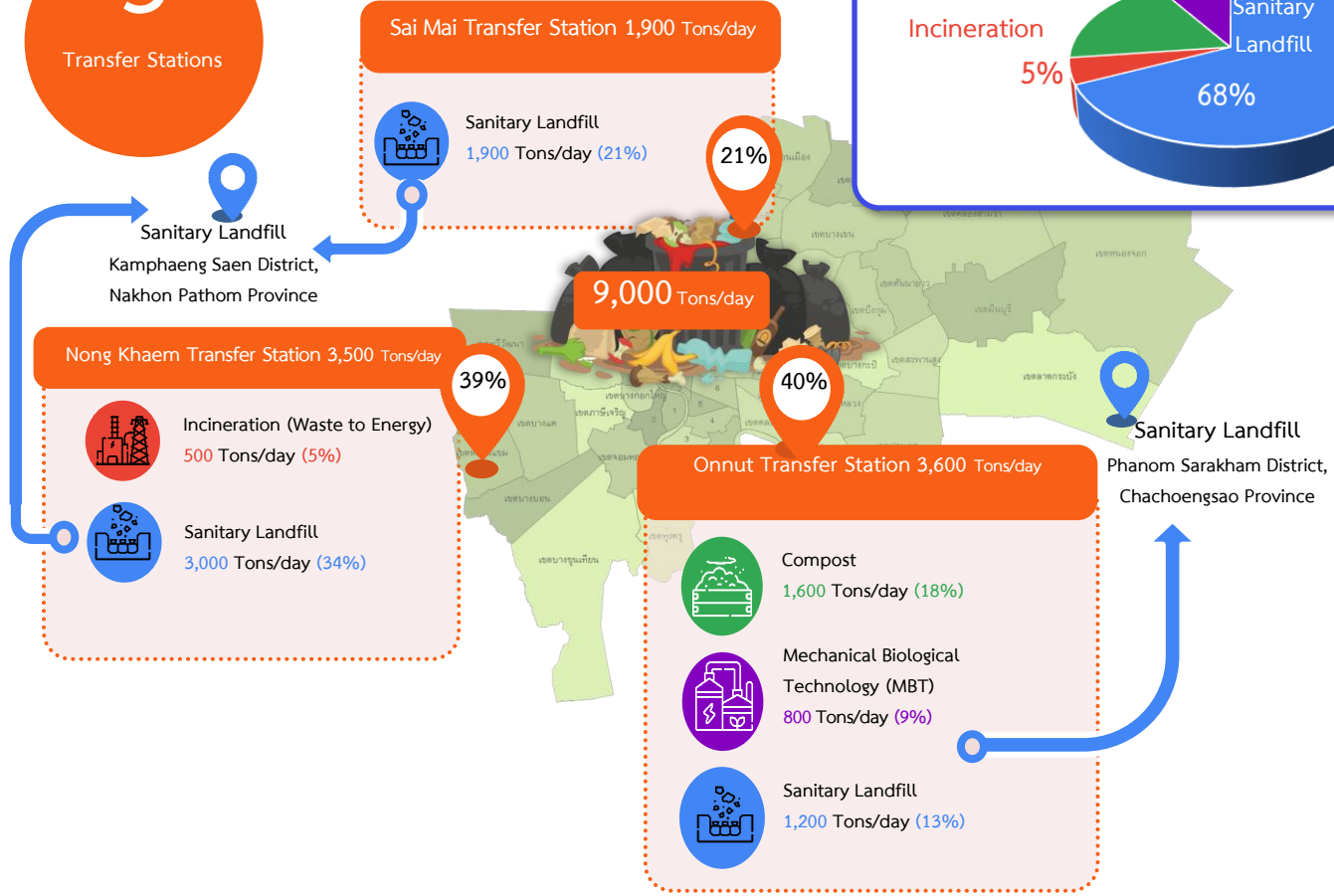
Recyclable Paper (1.94%) Recyclable Plastic (1.62%) Glass (1.50%) Foam (1.45%) Nappy (0.71%)
Bone & Shell (1.47%) Metal (1.34%) Rubber & Leather (1.43%) Stone & Ceramic (0.91%)

Solid Waste Management in Bangkok



Solid Waste Disposal in Bangkok

3
Transfer Stations



Waste Separation Model

➤ Further Develop to Holistic Waste Management in District Level

“ไม่เทรวม” “No Mixed Waste” Project

Solid Waste Management Model : 3 Districts (Pathumwan, Phyathai Nong, Khaem)

Phase 1: 3 Pilot Districts by 3 Routes/District; 5 Sep, 2022 – 19 Dec, 2022 (106 days)

Phase 2: Extended to 50 Districts; 12 Dec, 2022 - present

Objectives

- To reduce the amount of waste to landfill followed the 3R concept, and reduce cost of waste disposal
- To develop solid waste management system, and strengthen the reliable to waste separation and collection system
- To reduce the amount of organic waste which mixed to general waste, reduce the problem of odor, leachate, pathogen, and improve the quality of live for solid waste collectors

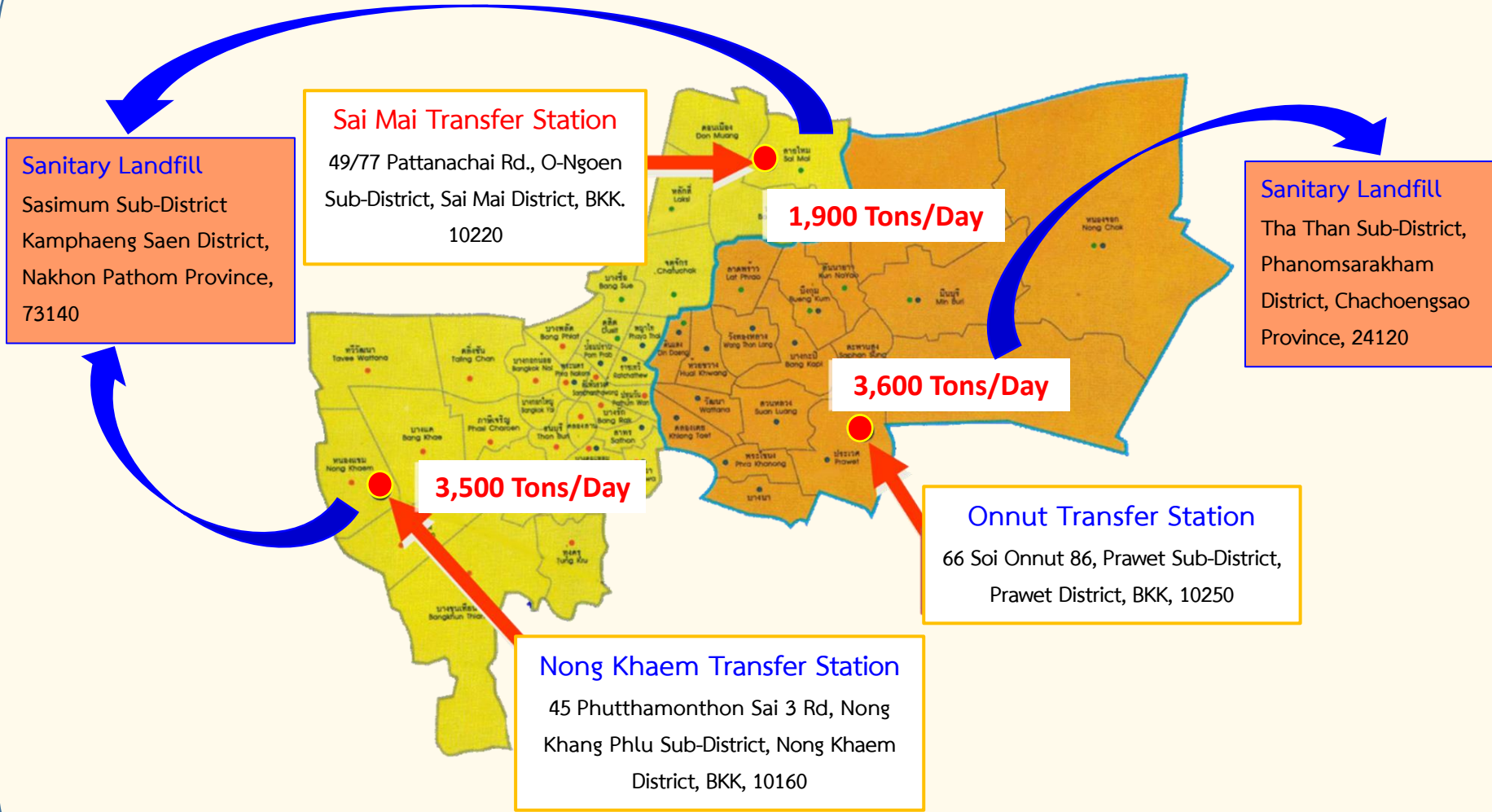


Implementation

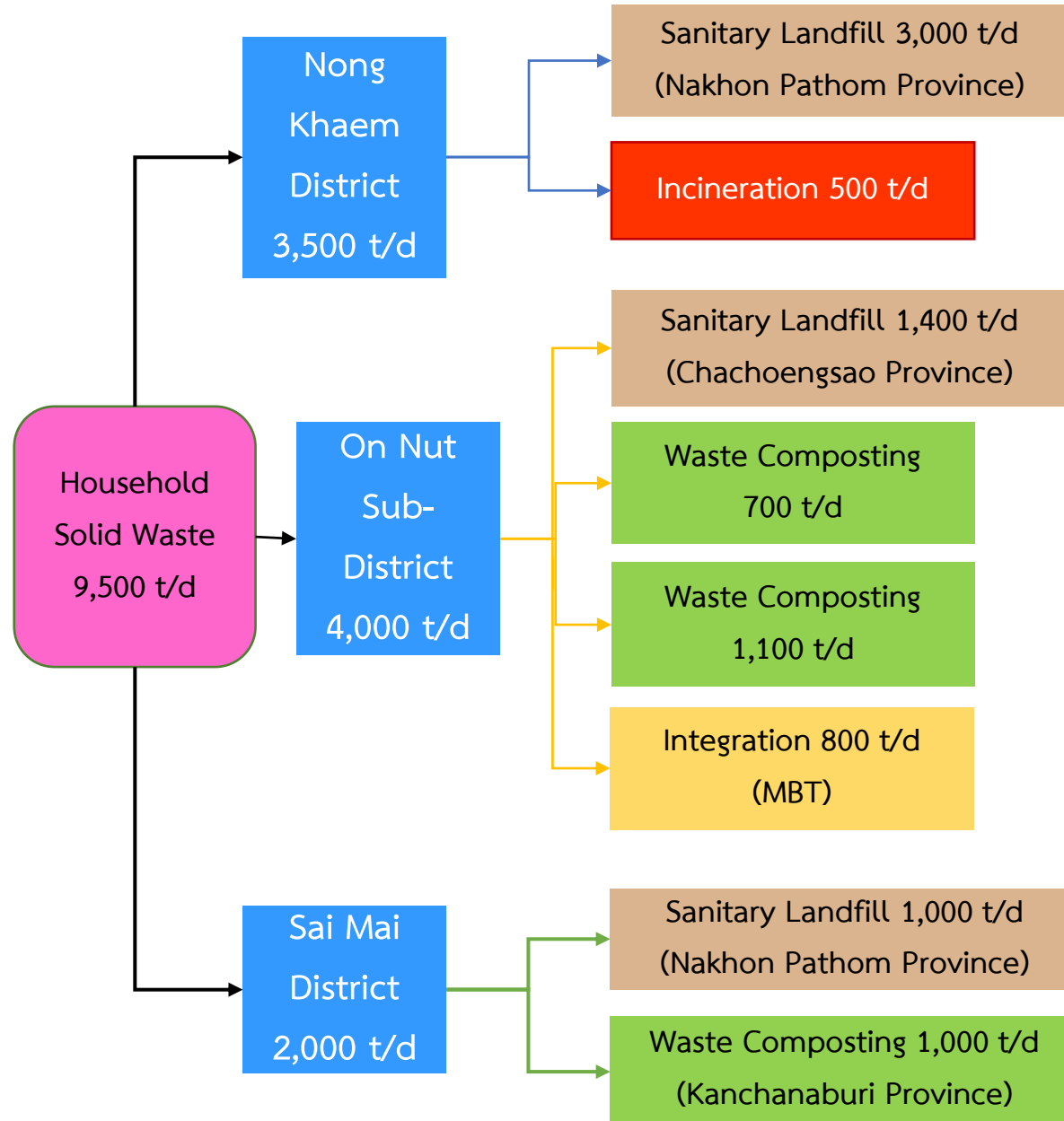
- Waste collection trucks: 5 tons (6 units) installed organic waste containers and public relations poster
- Waste collection truck (Open sided); 1.5 ton (3 units) with public relations poster
- Distribute district Announcement to public in pilot area during phase 1
- Public relations & Medias under concept “ไม่เทรวม ไม่เทรวม ไม่เทรวม”
- Launch project on 4 September 2022 at Lumpini Park, Pathumwan District



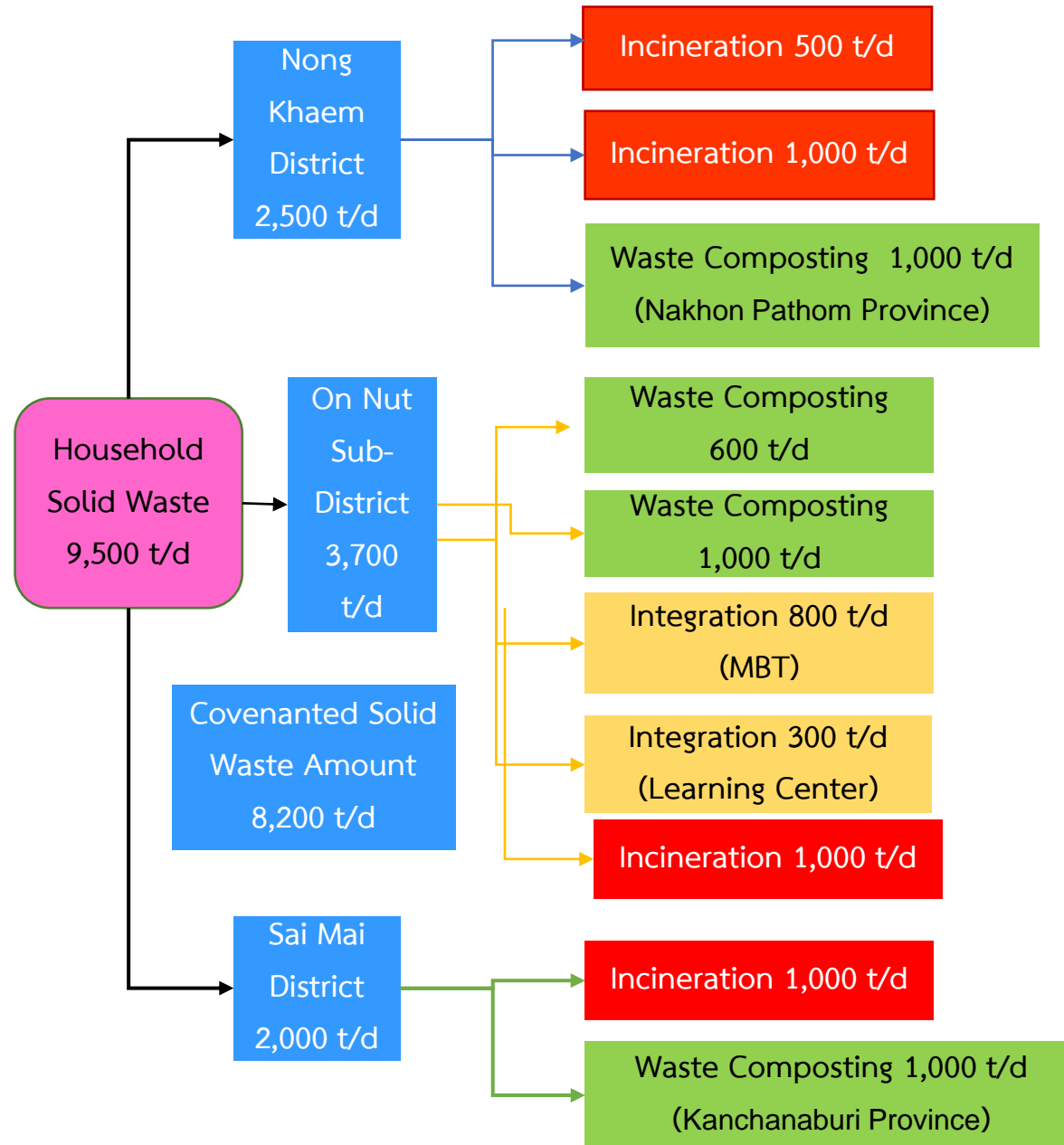
Solid Waste Disposal in Bangkok



Current Bangkok Solid Waste Disposal



Bangkok Solid Waste Disposal Plan





Investment and Business opportunities in Bangkok



Bangkok Wastewater Project

BOI Announcement 9/2565 : (Activity Based)

Category 7 Energy, Utilities & Environmental Industry

7.1 Public utilities and basic services

7.1.12 Waste treatment or disposal business

Important issues that project host agencies must consider in applying for investment promotion



1

“Projects for which the government has granted private concessions” enter the definition of “joint investment” according to the Public-Private Joint Investment Act, B.E. 2019, or enter the definition of being “Projects for which the government grants private concessions” according to relevant laws



2

Proposing for investment promotion should include a clear feasibility study that has been considered by the SEPO and NESDB for submission to the Investment Promotion Committee. of which the Prime Minister is the chairman.



3

There should be an assessment of the value of the privilege to be requested, such as exemption from import duties on machinery, etc.