

FINANCIAL RESPONSIBILITIES & GLOBAL BEST PRACTICES ON EPR

8th September 2020

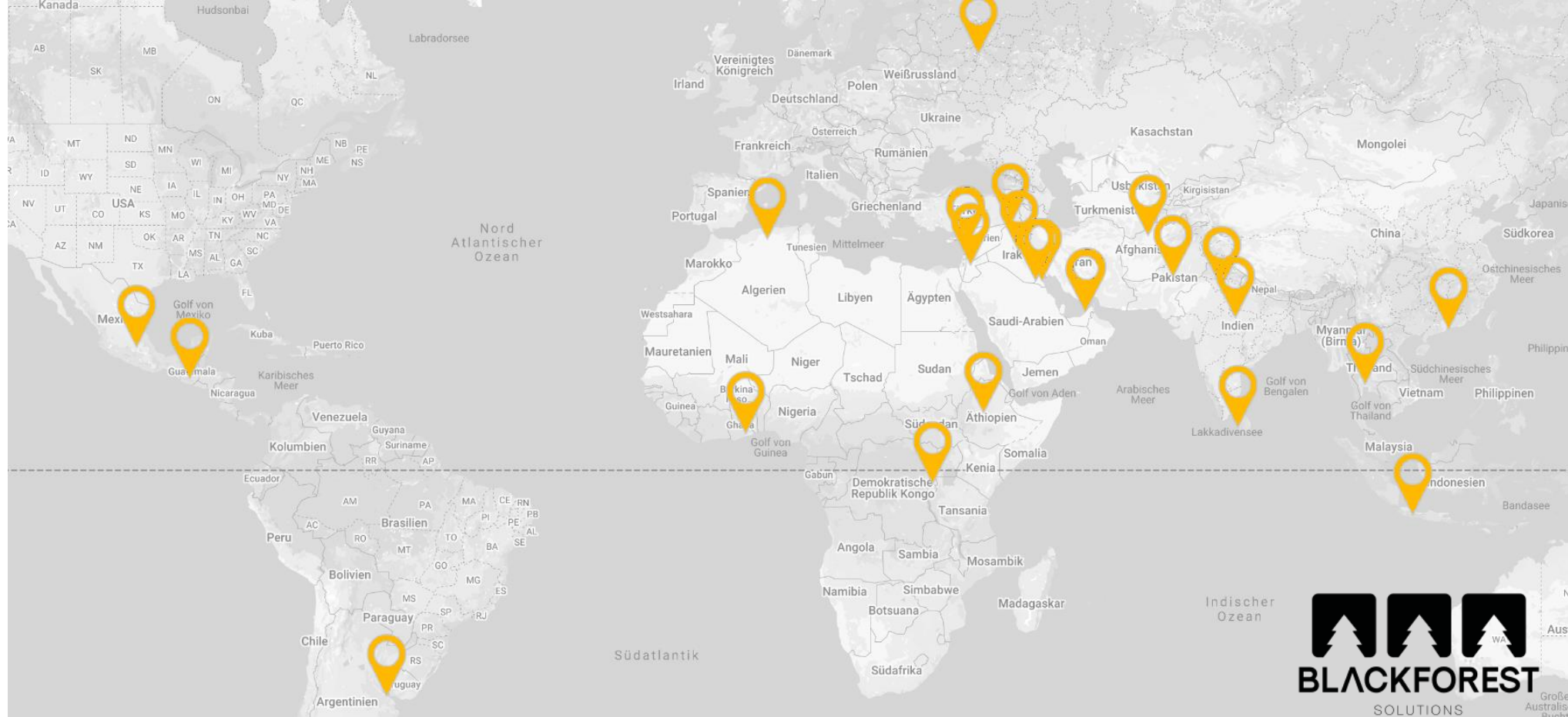
Sebastian Frisch

AGENDA

1. Introduction BlackForest Solutions
2. What is Extended Producer Responsibility (EPR)?
3. Types of Responsibilities in EPR schemes
4. Cost Principles
5. Experiences from the German EPR Packaging System



source: BlackForest Solutions



Tailored A-Z waste management solutions

More than 200 consultancy projects in fields of hazardous & non-hazardous waste management.

**PROJECT PARTNER FOR EPR
SCHEME FOR PACKAGING
WASTE IN EGYPT & ALGERIA**

- Consortium with GIZ GmbH

Definition of Extended Producer Responsibility



An environmental policy approach in which a **producer's responsibility** for a product is **extended to the post-consumer stage of a product's life cycle**

Source: OECD <https://www.oecd.org/env/tools-evaluation/extendedproducerresponsibility.htm>

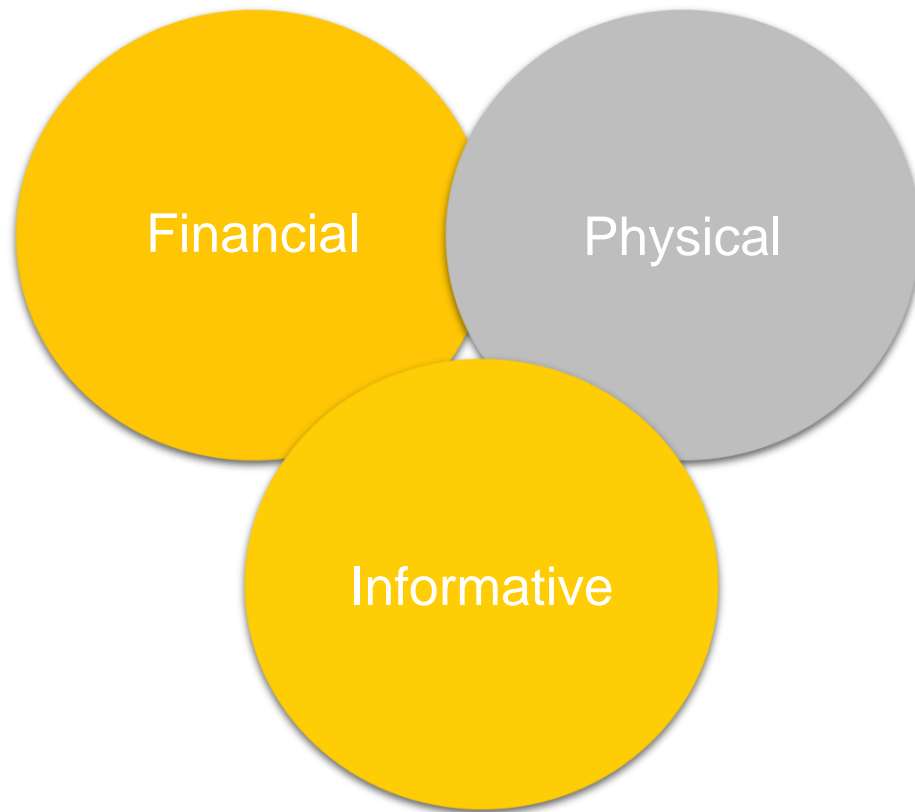
“Polluter pays” principle




Cost not to be covered by municipal waste fees to citizen
No cost for municipalities
No cost for last user / at the point of „disposal“

= Producers to finance **collection, sorting and recycling**

Types of responsibilities in EPR schemes



- Not all responsibilities have to be allocated to the same actor
- Three types of responsibilities
 - Who pays? (**financial**)
 - Who organises? (**physical**)
 - Who provides information? (**informative**)



How are these types of responsibilities allocated among the key stakeholders?

Solid financials for best potentials

- Without provision of financial resources to conduct collection, dismantling and recycling, **EPR schemes will not become mainstream**
- Typical financial mechanisms to raise funding include **Advanced Recycling Fees (ARF) and Deposit Refund Schemes (DRS)**
- Complementary financial instruments which support the implementation of EPR schemes can be **landfill taxes or incineration taxes**, amongst others
- **Penalties for non-compliance** of producer's/ importer's obligations **should not be used for financing the EPR scheme** as this can create adverse incentives for the system as a whole!

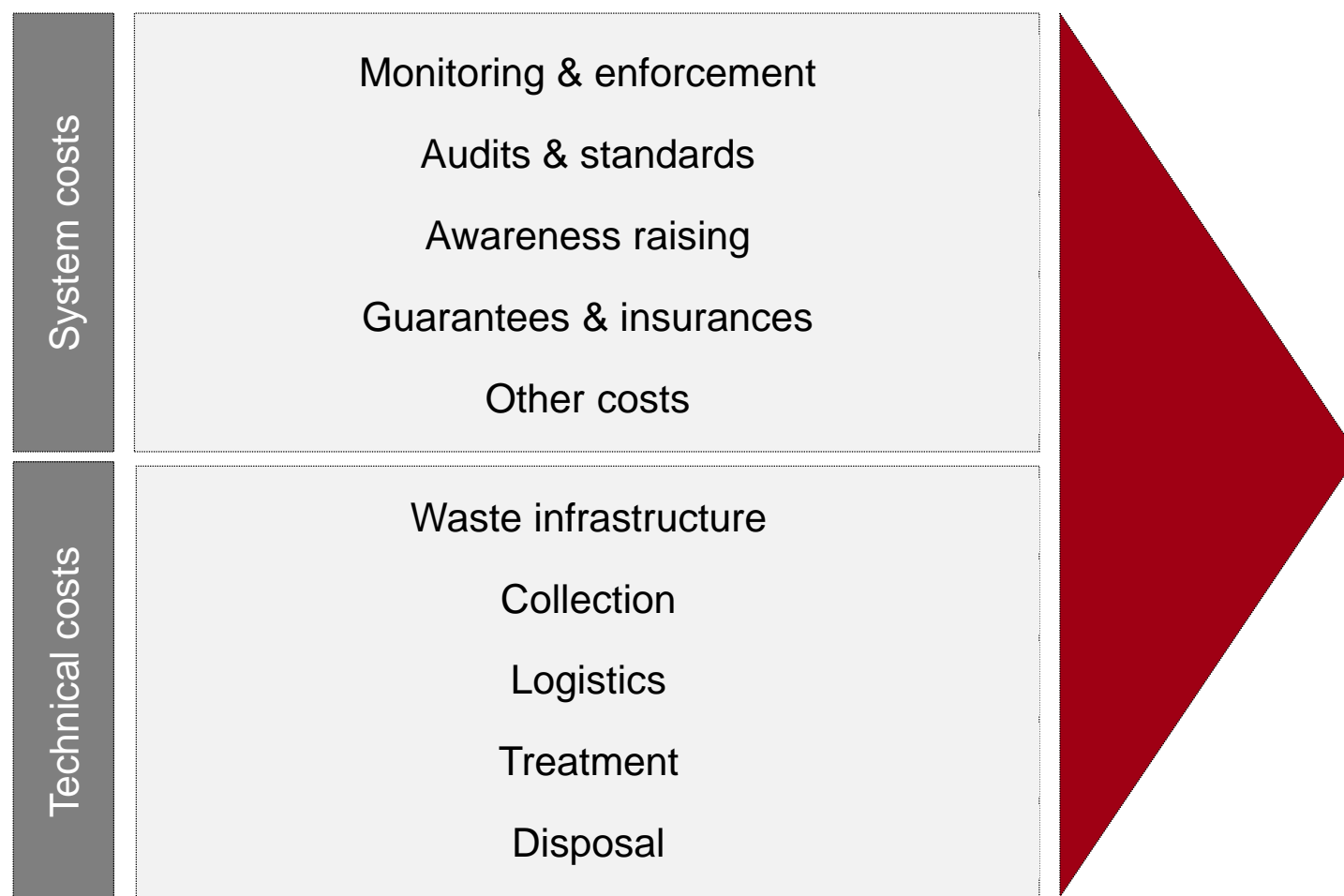
What should be financed exactly?

- The most common financial mechanism is a **levy raised on products put on the market to finance the cost of the EPR**; however, the EPR schemes can also be financed **through taxes**
- In order to determine the magnitude of the levies/taxes, we can distinguish between **two „cost principles“**

Full Cost Principle (I)

- According to the **Full Cost Principle**, levies should cover the net costs for the **management of waste** (technical) as well as **administrative and communication costs** (system) of the EPR scheme
- In theory, this may include:
 - Costs for collection and treatment of **separately collected waste types**, minus revenues from the sales of recovered materials
 - Costs for collection and treatment **non-separately collected waste types** (e.g. waste collected together with mixed municipal waste) – including price differences to the informal sector
 - Costs for public **information and awareness raising** to ensure participation of consumers with in the scheme (separate collection!)
 - Costs related to **waste prevention, eco-design and research**
 - Costs related **monitoring, reporting and enforcement** (including, auditing, measures against free riders, etc.)

Full Cost Principle (II)



Full Cost Principle (III)

- Note: **„full cost“ does not always mean „full coverage“**
- The **level of coverage** (full or partial) varies and is closely linked to the **allocation of responsibilities** between stakeholders.
- Can be **applied as an average fee** to all stakeholders (mainly producers/ importers) **or by making graduations** based on (e.g.) recyclability and reusability (= True Cost Principle)

Costs for each item are not significant



The bag has a capacity of about 3 liters and weighs about 1.5.grams.

With a **license fee of 100 €** per tonne, the license costs **per bag** are about **0.015 ct**



This bag has a capacity of about 0,2 liters and weighs about 2 grams.

With a **license fee of 100 €** per tonne, the license costs **per bag** are about **0.02 ct**

True Cost Principle (I)

- The **True Cost Principle** aims at individualising producer's financial responsibility by linking it with the **true cost of end-of-life management and/or eco-design efforts**
- Introduction of **eco-modulated fees**, e.g. based on:
 - Use of restricted substances
 - Recyclability
 - Reusability
 - Ease of separate collection
- The true costs of a product can be difficult to estimate, hence approximations are necessary and fees are based on bonus/malus scorings

True Cost Principle (II)

Example for WEEE case :

- Case study: **Eco-modulation of fees by e-waste PROs in France**
- Eco-modulated fees were **created by a multi-stakeholder group** in the context of preparation of specifications for the e-waste PROs.
- Covers 13 product types as of today.

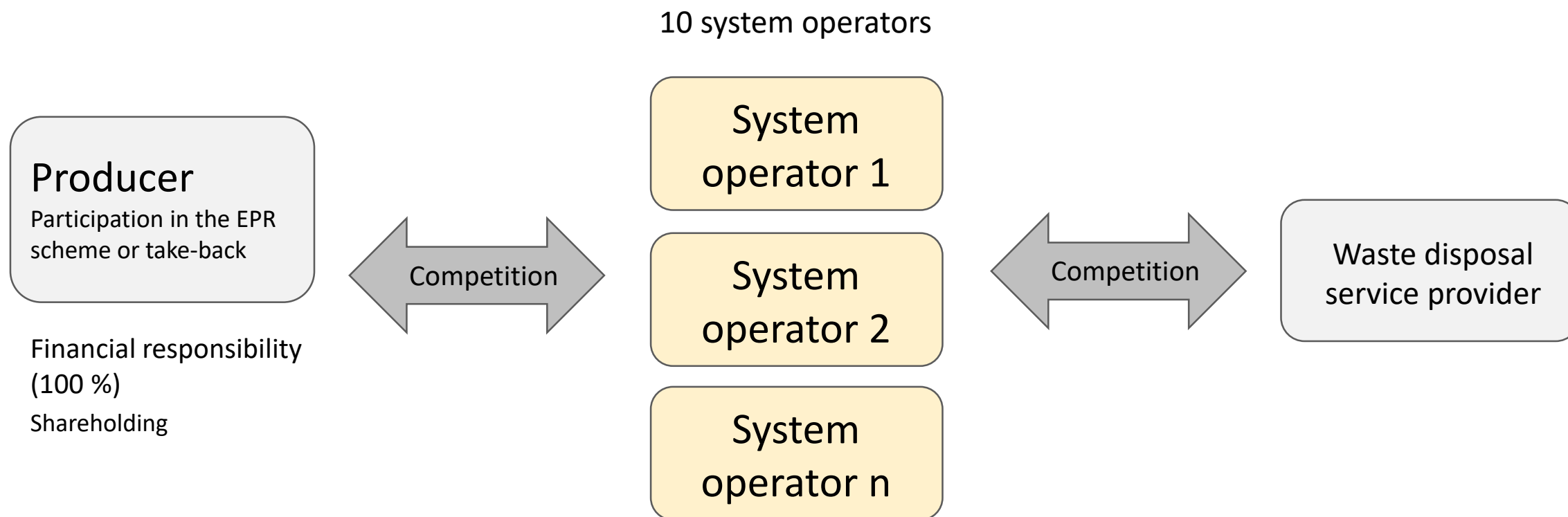
TERRITORY

In order to design practical solutions, the territory for the EPR initiative must be taken into consideration:

- Is EPR to be deployed at **national** level? **Local** level? **Regional** level?
 - What are the **characteristics of the territory**?
 - Geography, demography, economy, infrastructures available...
 - What **particular challenges** are to be considered?
- EPR is not « one size fits all »!**

EXPERIENCES FROM THE GERMAN EPR PACKAGING SYSTEM

The German EPR System



source: EPR MENA Broschure

Kerbside collection (German Households)



Packaging can be recycled if collected and sorted



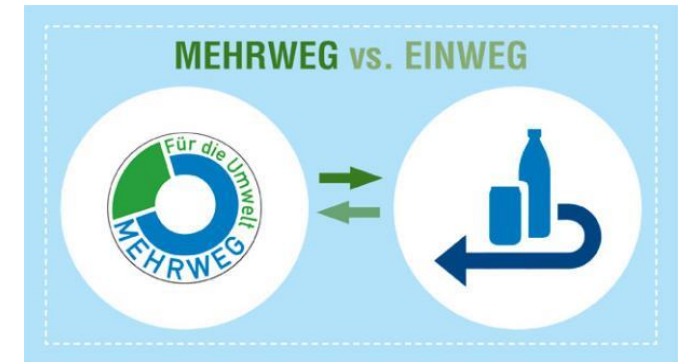
Extended Obligation for Beverage Packaging

NEW COMPULSORY DEPOSIT FOR FOLLOWING ONE-WAY DRINKS (§31)

- Drinks with a whey content of more than 50 %
- Carbonated fruit and vegetable drinks

ONE WAY / REUSABLE : CLEAR MARKING AND VISIBLE CUSTOMERS INFORMATION ON POINT OF SALE (§32)

- Applies to mail order shopping, stationary and online retailers



source: LANDBELL GROUP,
BlackForest Solutions

Obligation of Data Reports (§ 10)

Producers are also **obliged** to **immediately transmit to the Central Office** all the packaging information, they also provided to their compliance scheme within the scope of their contract, specifying at least the following data - **incl. subsequent quantity changes**:

1. **Type** of material and **weight** of packaging
2. **Name of the system** where system participation is effected
3. **Period of contract and reporting frequency**

▶ **No quantity thresholds for reporting to the Central Office!**
Quantity thresholds only in Declaration of Completeness (§ 11)

▶ **Easy matching of data with system reports is possible** - because both data reports go to the Central Office = **Transparency**.

source: LANDBELL GROUP,
BlackForest Solutions

Fines

- **In case of non-registration** or of distribution of goods, where the manufacturer has not correctly registered the brands they are distributing, there is a potential fine of up to **100,000 EUR**
- **Non-participation in a compliance scheme** may be punished with a fine of up to **200,000 EUR**
- **Failure to report packaging data** to the Zentrale Stelle will result in fines of up to **10,000 EUR**
- **Failure in submission of the Declaration on completeness** may result to fines of up to **100,000 EUR**

THANK YOU FOR
YOUR ATTENTION!



**China Integrated Waste Management NAMA Support Project
Low-carbon Integrated Waste Management Symposium 2020
Business and Financing Models for Low-carbon Integrated Solid Waste Management**

Pay-as-you-throw systems Lessons learnt from Saxony, Germany



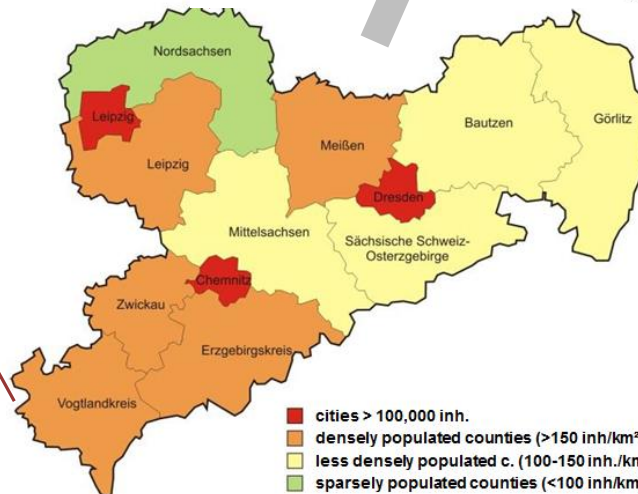
Jan Reichenbach

INTECUS GmbH, Dresden/Germany

Saxony – a brief overview



- one of the 16 German federal states
- territory ~18,500 km²
- about 4 million inhab.
- 3 big cities + 10 counties



- several waste associations have formed to organizing municipal solid waste management

Recovery of environmental costs

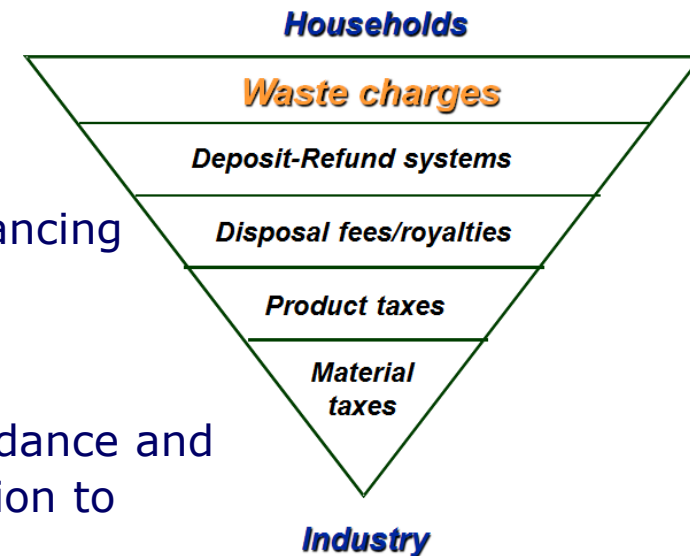
'Polluter pays' – principle

(Art. 15 Directive 75/442/EEC on waste, WFD 2008/98/EC + Environmental Liabilities Directive 2004/35/EC)

"costs of managing environmental burdens (=waste) must be borne by the generator of that burden (=waste producer or waste holders)"

General rules for MSWM financing in Germany

- #1 Each person should contribute** to finance the management of waste by paying charges
- #2 Charges must be cost-covering**, no cross-financing of other community expenses and services
- #3 No profits** shall be made from waste charges
- #4 Charges should create incentives** for the avoidance and environmental-friendly disposal of waste (diversion to recycling)



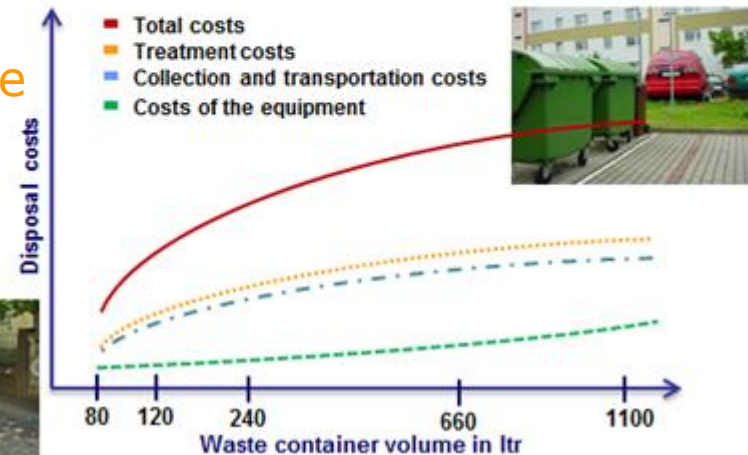
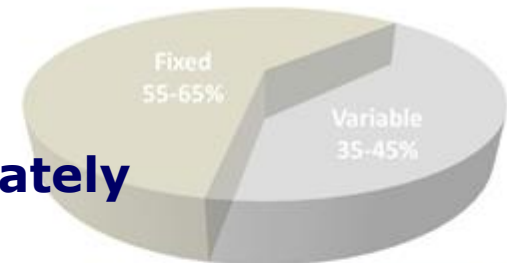
Apart from that there is a high degree of freedom to structure charges
e.g. linear, progressive, degressive tariff setting

PAYT as a model to individually allocate SWM costs

Court of Justice's interpretation of the **Polluter pays**-principle:
"polluter can only be held liable to pay to what he contributed"

General **taxes or a flat rate** payments **cannot**
reflect individual cost responsibility appropriately

- Individuals behave (consume) differently
- Waste type, amounts and costs cannot be assumed as being constant
- Environmental goals require incentives to reduce waste



Pay-as-you-throw

a more stringent way of applying the polluter pays principle in that costs are allocated proportionate to those who actually cause them

(👉 aren't waste services comparable to utilities like water or power supply?)

PAYT in Saxony

Drivers for introduction

- **Changeover** from basically tax-financed MSWM system **to user charge** *(in the course of German reunification process)*
- Citizen's **wish for a fair and transparent billing**
- Pressure on authorities to set up a system that is **cost-efficient and suitable to encourage waste separation** *(new legal obligations since 1991)*

Implementation goes via

i. tariff components

e.g. two-tiered or multi-component charges, payment for residual waste presented to collection in combination with lower or zero charge for collection of recyclables (=differentiated fees)

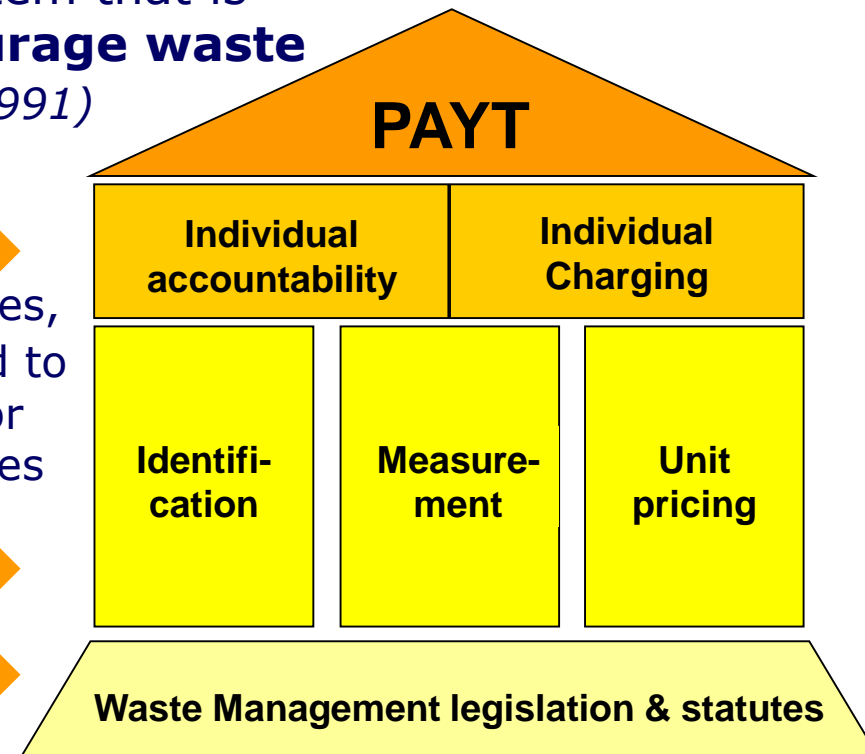
ii. technical components

e.g. electronic chip for identification

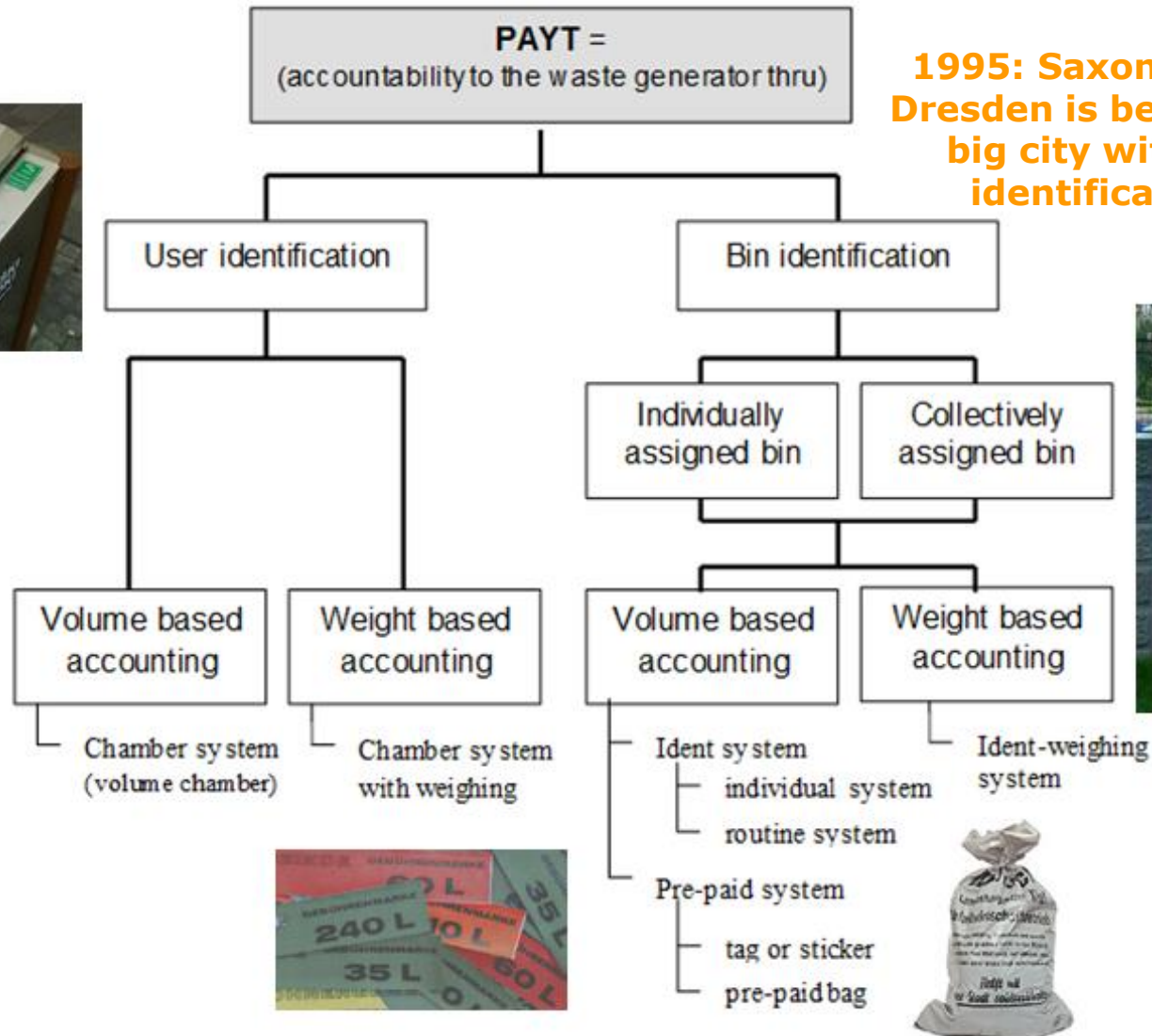
iii. legislative components

e.g. mandatory chargeable minimum

#1-3 of MSWM finance rules are provisions by Germany's constitutional law and the community charges act



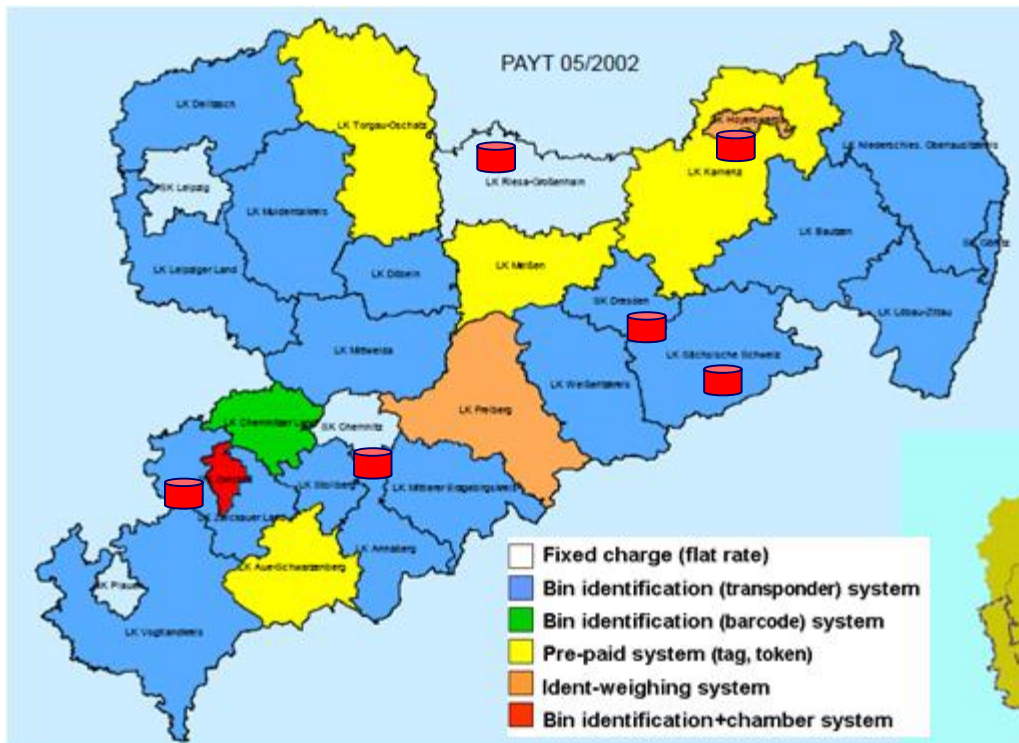
Technical arrangements for PAYT implementation



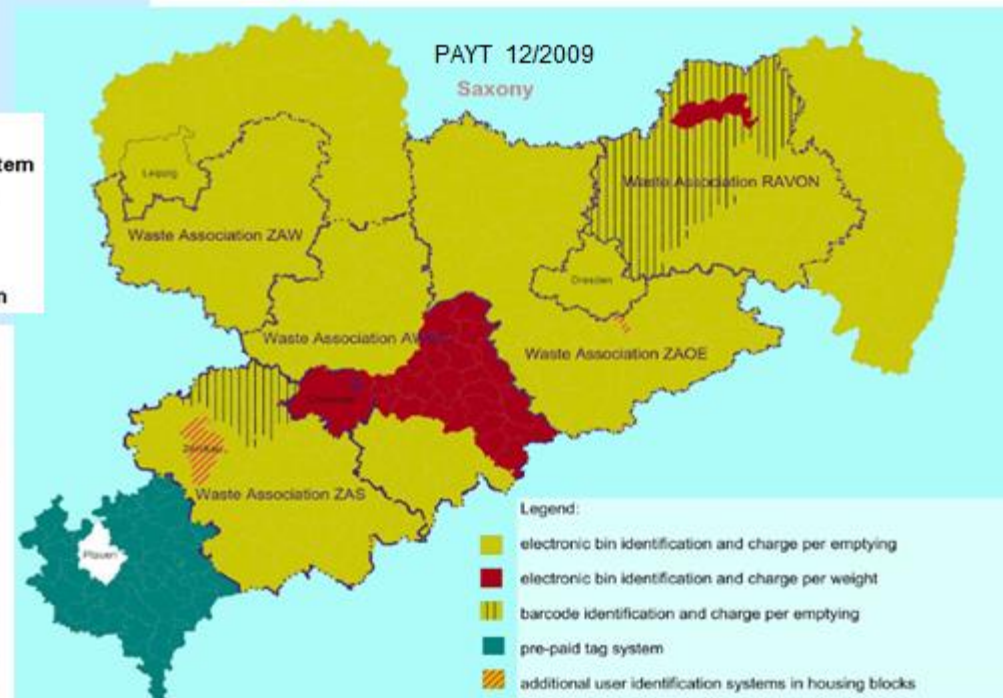
1995: Saxony's state capital Dresden is becoming the first big city with electronic bin identification in Germany (MAWIS system)



Evolution of PAYT schemes in Saxony



■ **Today: Electronic bin-identification with volume-based charge most widespread**



Findings from PAYT pilot testing and startup phase

Commonly observed effects:

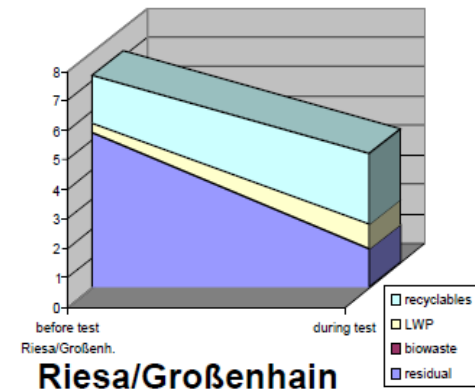
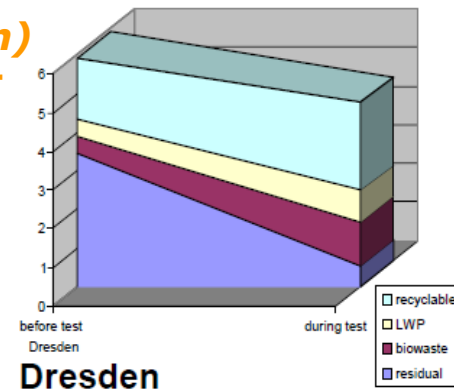
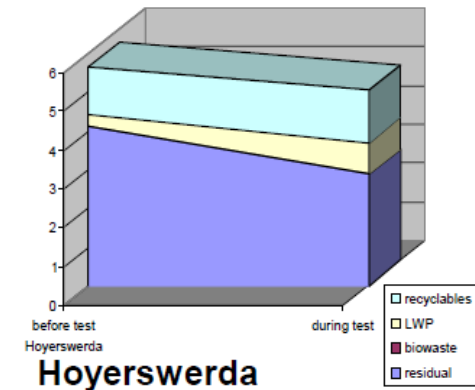
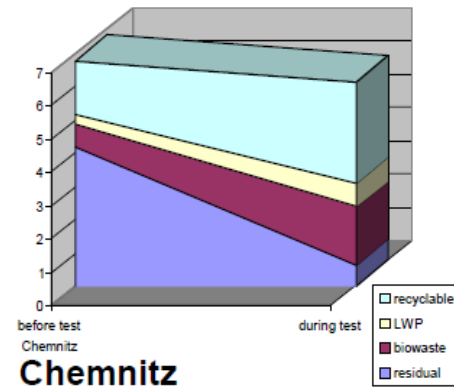
- **reduced residual waste amounts**
- **growing waste diversion/ separation efforts**
- **more home composting**

i.e. citizens aim to minimize their waste-related payments, e.g. by purchasing in a less wasteful manner (=prevention of waste) or separating for recycling (=waste reduction) which, if they don't, would result in higher charges or double payment

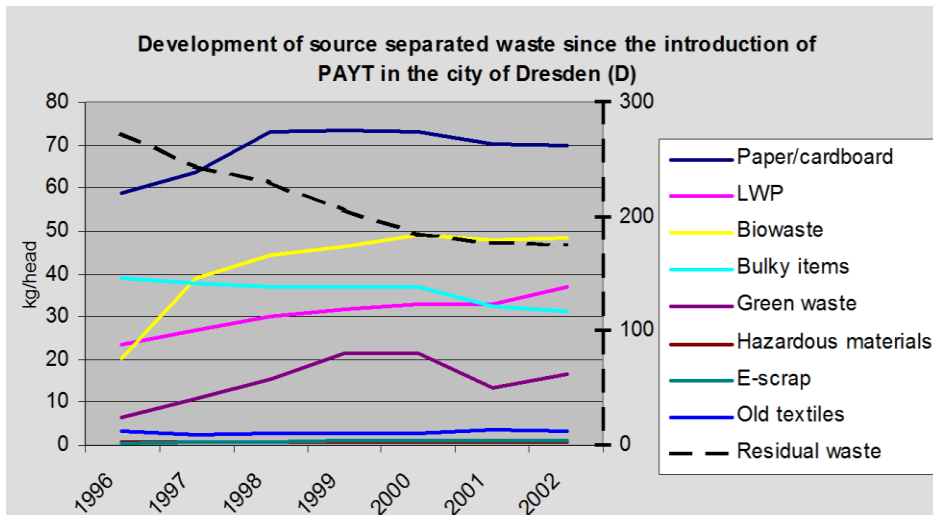
- occasional **attempts** to bypass the collection service and **to have waste disposed of in unfair (illegal) ways**

Need to:

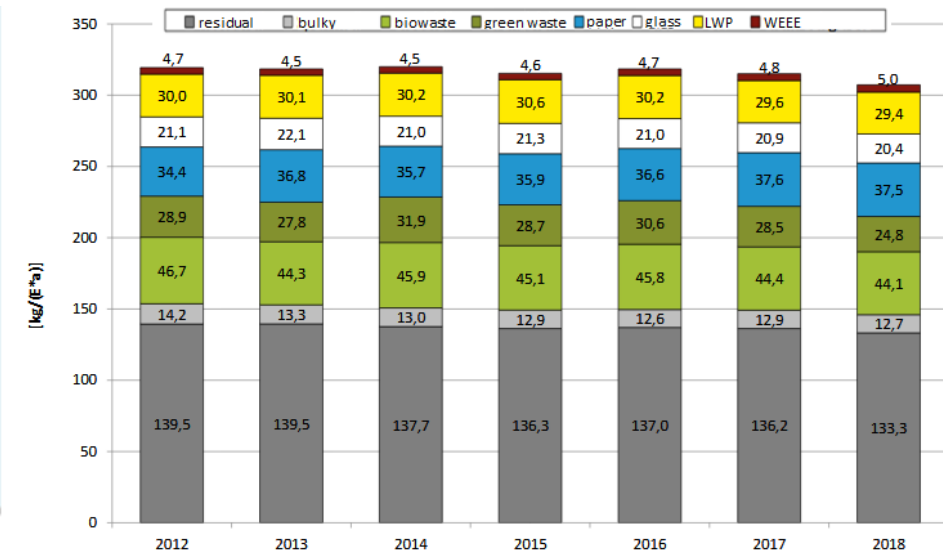
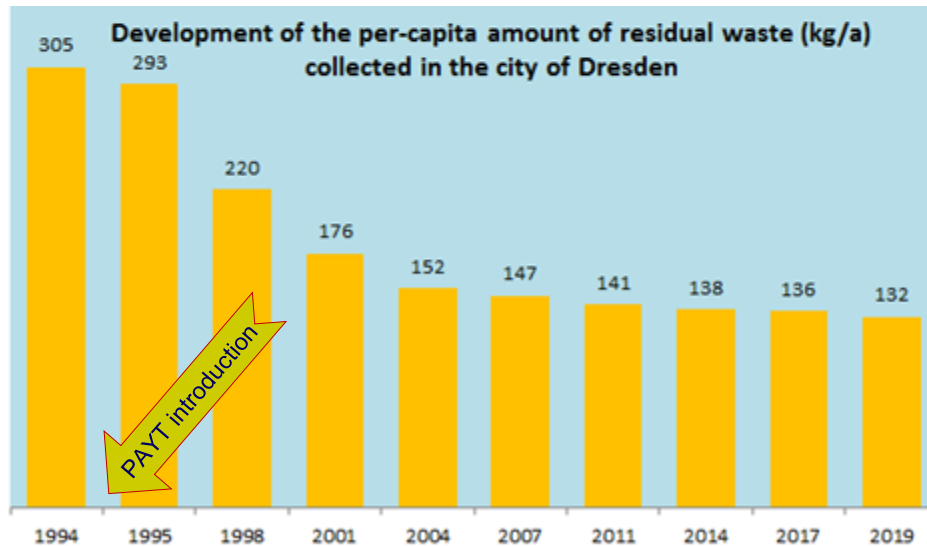
- **ensure strict enforcement and mechanisms of mutual control**
- **readjust regulatory stipulations** (e.g. introduction of a chargeable minimum)
- **technical fine-tuning** (change system components, work with access control)



PAYT yields sustainable effects



Dynamic developments with PAYT introduction were followed by stabilization at high level



Looking at PAYT in detail

The Dresden example

- Households save money when they separate, even more if they do composting!

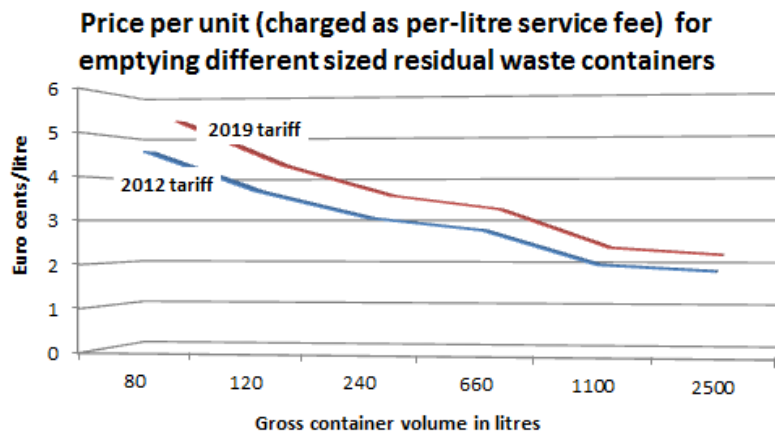
Total revenues from charges 100%

- Residual waste**
 - Basic fee 35%
 - Service fee 52%
- Biowaste** 12%
- other fees** 1%

Example of fee structure in the city of Dresden



Tariff differentiation for residual waste and biowaste service
(Rates as of 2014)

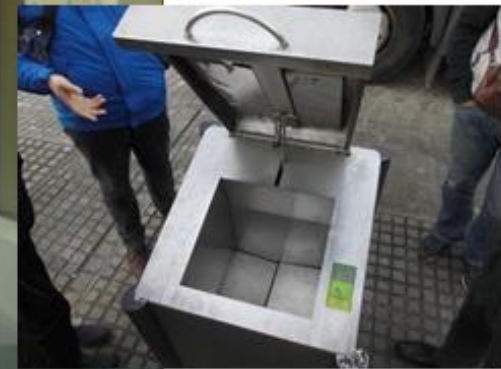


Container size	Basic fee per month	+	Service fee per emptying	Biowaste fee per month
80 l	3,60 €	+	3,66 €	7,00 €
120 l	5,39 €	+	4,40 €	10,50 €
240 l	10,79 €	+	7,33 €	21,00 €
660 l	29,67 €	+	18,33 €	57,75 €
1100 l	49,45 €	+	22,10 €	-----
2500 l	112,38 €	+	46,80 €	-----

City's MSWM costs between 2013-19 rose from EUR 33 to 35 mill. hence requiring tariff adjustment (3rd since 1996)

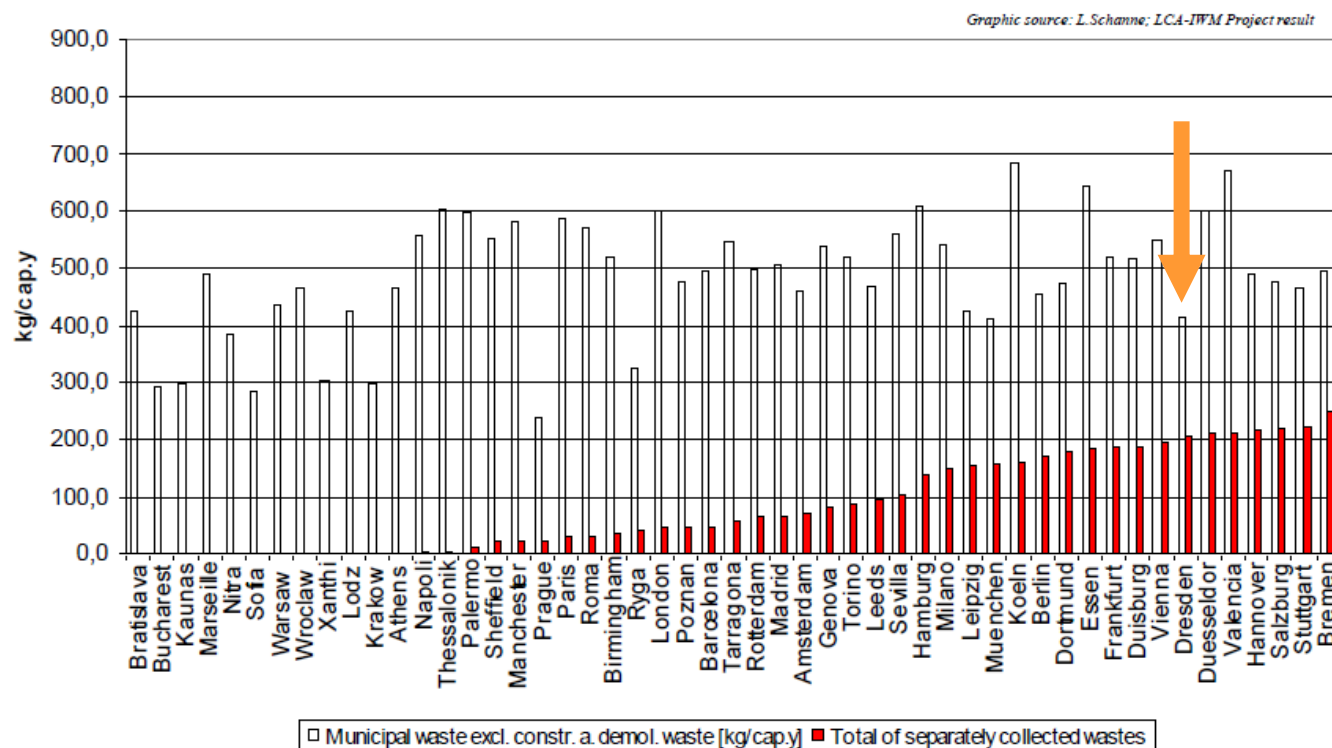
PAYT is internationally recognized and adopted

e.g. City of Ljubljana
(Slovenia) adopted a
sophisticated PAYT
scheme using an
electronic chamber
system in the inner
city parts





Dresden/Saxony perform well in MSWM as other PAYT areas do

MSW in order of increasing intensity of separate collection



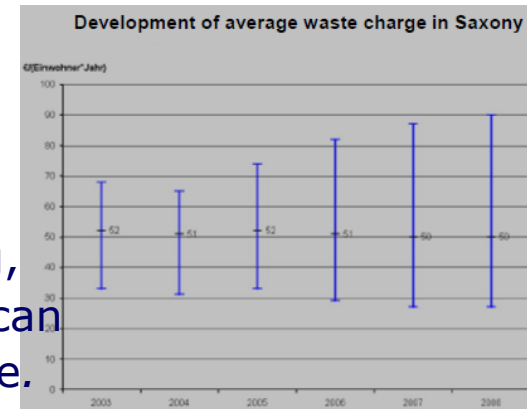
EC-commissioned study (2015)
Assessment of separate collection schemes in the 28 capitals of the EU

https://ec.europa.eu/environment/waste/studies/pdf/Separate%20collection_Final%20Report.pdf

 In cooperation with  WASTE · CONSUMPTION · PRODUCTION	PAYT	Fixed fee + PAYT	Flat rate	N/A
	Berlin, Budapest, Dublin, Helsinki, Ljubljana, Tallinn, Vienna	Copenhagen, Stockholm, Warsaw	Amsterdam, Brussels, Lisbon, London, Luxembourg, Paris, Vilnius	Athens, Bratislava, Bucharest, Madrid, Nicosia, Prague, Riga, Rome, Sofia, Valetta, Zagreb
Average collection rate (separate collected/generated MSW quantities)	35 %	17 %	17 %	10 %

What else has been learnt so far

- ➡ **PAYT** definitely **helped** achieving critical objectives in MSMW such as
 - visible and enduring **waste reduction/diversion efforts**,
 - good **system acceptance** due to a rather transparent and fair billing of services,
 - uncovering and exploiting hidden potentials for **system and cost optimization**.
- ➡ **PAYT allowed** MSWM authorities in Saxony
 - **gain the necessary experience** resp. knowledge **for system adjustments**,
e.g. decrease diversity in systems and get them harmonized over time;
controlling feared increase of landscape and material pollution
or acts of waste tourism (= no rise beyond average).
 - **keep citizens' financial burdens at moderate levels**
(= staying in the lower range within Germany).
- ➡ **PAYT raises** individual **awareness** on costs and recycling,
individuals though first look on the monetary savings they can
make from separating waste and not what it costs to recycle.
A consistent obligation to 'pay for pollution caused' thus must expand to include
 - pollution from improper segregation,
 - 'pollution' of products (adding unrecyclable components during production)

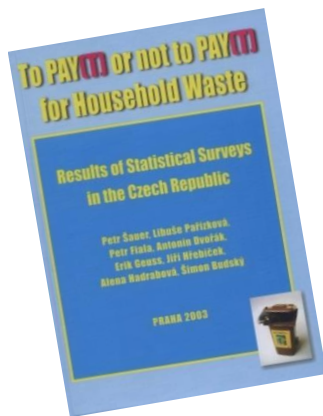


**PAYT needs to become piece of an environmentally-oriented policy package
and its success comes from a bundle of measures**

**China Integrated Waste Management NAMA Support Project
Low-carbon Integrated Waste Management Symposium 2020
Business and Financing Models for Low-carbon Integrated Solid Waste Management**

**Thank you very much
for your kind attention!**

Jan Reichenbach



Berliner Stadtreinigung (BSR)

Focus on financial model



Content

- I. Organisational structure**
- II. Area of services**
- III. Financing model**



I. Organisational Structure

Type of company and mandate

- **BSR** is **100% owned** by the **State of Berlin**
- **BSR** is a **public limited company**
- BSR is commissioned to perform the responsibilities of the State of Berlin in matters of
 - **Refuse collection**
 - **Waste treatment**
 - **Street cleaning, snow removal and gritting**
- **BSR** is allowed also to **operate commercially** e.g. via **subsidiaries**.
- When fulfilling the responsibilities of public administration, **BSR** is **financing** its tasks through **fees**. In this case the generation of profits is strictly ruled out.



I. Organisational Structure

Key figures 2019

Sales revenue:
EUR 605m
(EUR 60m)

from that Waste Management:
EUR 310m

**from that Cleaning
and Snow removal:**
EUR 245m

Net profit:
EUR 45m
(EUR 16m)

**Annual average
of employees:**
5993
(6350)



II. Area of services

Waste disposal for all Berlin homes

- approx. 1,700 employees and approx. 400 vehicles -



- **Collection of household and commercial waste**
approx. 18.5 million collections per annum, from approx. 354,000 waste containers



- **Collection of recyclables**
approx. 0.9 million emptyings of about 27,600 waste containers

- **Collection of organic waste**
approx. 3.5 million collections per annum, from approx. 95,500 waste containers

- **Bulky waste**
Collection of approx. 50,000 tons

- **Christmas trees**
320,000 collected and recycled

- **15 recycling depots**
taking on approx. 20 types of recycling materials and approx. 30 pollutants



II. Area of services

Guaranteeing cleanliness through state-of-the-art technology

- 2,400 employees, 800 vehicles -



Cleaning of streets and pavements

- approx. 27,600 kilometres pavements per week
- approx. 19,350 kilometres streets per week
- approx. 6,1 million waste basket collections per year
- approx. 227,000 gully clean-ups per year
- Collection of approx., 57,000 tons of street waste, of approx. 20,000 tons of dog feces, of approx. 110,000 m³ of leaf and of approx. 11,500 leaf bags (all per year)
- Removal of approx. 24,000 m³ of illegal debris per year

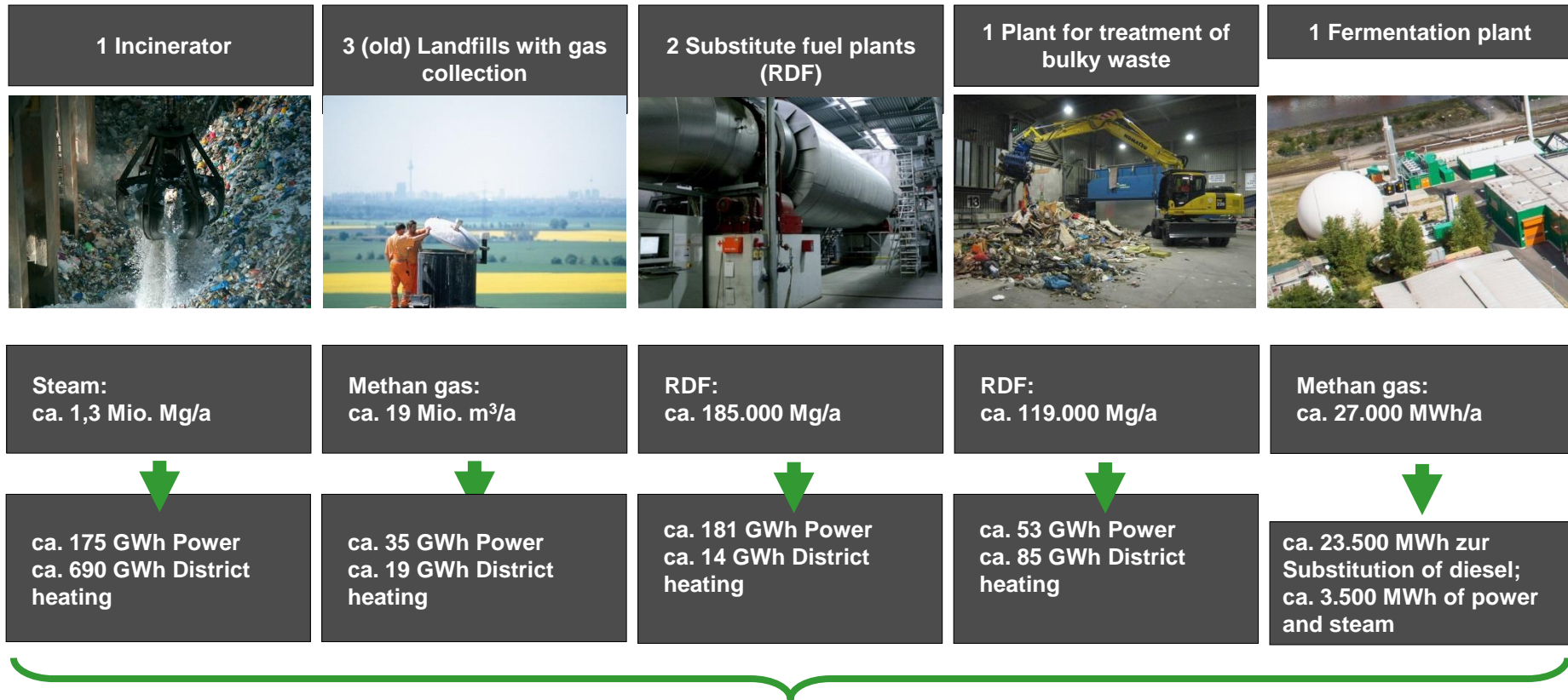
Snow removal and gritting

- 12,500 kilometres in 2 operational stages
 - **Operational Stage 1:** Motorways, public transport, playgrounds, schools, care homes
 - **Operational Stage 2:** road sides and bike paths
- More than 18,600 crossroads
- approx. 1,200 kilometres of bike paths
- GPS navigation and data recording



II. Area of services

Treatment, facilities, plants



Electricity supply for more than 10 % of standard Berlin households
District heating for around 9,5% Berlin households with district heating connection



II. Area of services

Second hand shop – **NochMall** – opening in August 2020

- 100% subsidiary of BSR
- Agreement with BSR to subsidize within the first 5 years if necessary
- Perfect marketing instrument for circular economy
- So far overweldig many customers



III. Financing model

Terms and condition of services, tariffs and fees

Tarife und Leistungsbedingungen der Berliner Stadtreinigungsbetriebe

Vom 1. Januar 2019

Approved and released by the state of Berlin

Fundstelle

Auszug:




ABl. Nr. 52 vom 28. Dezember 2018, Seite 7205 – 7229
Inkrafttreten am 1. Januar 2019

Berliner Stadtreinigung



III. Financing model

Service fee structure for waste collection

 basic charge 	 variable charge	free of charge
<ul style="list-style-type: none">• <u>household-related</u> (<u>per apartment, housing</u> <u>or utilisation unit</u>)• <u>regardless of the bin size</u> <u>and the number of emptyings</u>• <u>per year</u>• <u>related to the costs of</u> <u>services that are calculated</u> <u>not fully cost-covering</u> <p>31,56 € per unit and year*</p>	<ul style="list-style-type: none">• <u>variable charge on mixed waste</u> <u>related to bin size and frequency</u> <u>of emptying</u>• <u>variable charge on Green waste</u> <u>related to bin size and frequency</u> <u>of emptying</u>• <u>Other cost reduced services:</u><ul style="list-style-type: none">– <u>bulky waste service fee</u>– <u>service for bin transport</u>– <u>Prices for Leaf Sacs</u>	<ul style="list-style-type: none">• <u>recycling and reuse center</u>• <u>collection of recyclables and</u> <u>non-packaging of similar</u> <u>material (bin for recyclables)</u>• <u>christmas tree collection</u>• <u>provision of bring sites for /</u> <u>electronic scrap / WEEE-</u> <u>collection</u>• <u>etc.</u>



III. Financing Model

Standard fees for waste collection

Example calculation for an
120 l Container / quarter
with a frequency of
emptying every second
week

$$\begin{array}{r} 34,67 \text{ € } 120 \text{ l container} \\ + 7,89 \text{ € basic rate} \\ \hline \underline{42,65 \text{ € / q}} \end{array}$$

Per year
 $42,65 \text{ €} \times 4 \text{ q} = \underline{170,60 \text{ € / a}}$

Müllabfuhr Ökotarif basic rate per household / quarter
je Nutzungseinheit (Haushalt) und Quartal

7,89 €

Müllabfuhr Leistungstarif

Tarife pro Quartal bei 14-täglicher Entleerung im Standardtarif. Bei wöchentlicher Entleerung verdoppeln sich die Tarife.

emptying every
second week



	60l	120l	240l	660l	1.100l	1.100l Müllabfuhr
Hausmülltonne	28,24 €	34,76 €	42,75 €	102,19 €	142,73 €	173,78 €
Bioguttonne	–	12,00 €	13,50 €	–	–	–
Wertstofftonne / Wertstoffsack	–	–	entgeltfrei	entgeltfrei	entgeltfrei	–
Laub- und Gartentonne	–	–	–	16,00 €	–	–
Schachtabfuhr Hausmüll			309,16 €	–		
Unterflurcontainer Hausmüll			–	938,69 €		



III. Financing model

Comfort surcharge waste collection

Komforttarife

Tarife pro Quartal bei 14-täglicher Entleerung. Bei wöchentlicher Entleerung verdoppeln sich die Tarife.
Komforttarife fallen bei Stufen und größeren Entfernungen an.

per quarter and every second week



Komforttarif 1 distance and or steps of a stairway

mehr als 15 und bis 30 m Entfernung oder 6 bis 10 Stufen

3,17 €

5,45 €*

Komforttarif 2

mehr als 30 und bis 50 m Entfernung oder 11 bis 15 Stufen

9,13 €

17,80 €*

Komforttarif 3

mehr als 50 und bis 100 m Entfernung oder 16 bis 20 Stufen

17,54 €

41,31 €*

Example comfort surcharge waste collection (e. g. 40 m distance) freq. every second week

34,67 € 120 l container

+ 7,89 € basic rate

+ 9,13 €/q (comf. sur.)

51,78 €/q

per year

x 4 q = 207,15 €/a



III. Financing model

Bulky waste fees (collection system)

Sperrmüllabfuhr bulky waste

Tarife pro Abfuhr. Bei der Sperrmüllabfuhr ist die Mitnahme von Elektroaltgeräten und Alttextilien inklusive.

Spartarif / saver	pauschal bis 5 m ³ , Abholung innerhalb von 4 bis 6 Wochen	50 € jeder weitere angefangene m ³ je 10 €
Standardtarif / standard	pauschal bis 5 m ³ , Abholung innerhalb von 2 bis 3 Wochen	100 € jeder weitere angefangene m ³ je 20 €
Expresstarif / express	pauschal bis 2 m ³ , Abholung innerhalb von einer Woche	96 € jeder weitere angefangene m ³ je 48 €



III. Financing model

Fees street cleaning

Example calculation for
1000 m² property with a
frequency once a week

$$1000 \text{ m}^2 \times 0,0367 \text{ €/m}^2$$

$$\underline{36,70 \text{ €/1000 m}^2}$$

cleaning once a week

Reinigungstarife

Tarife pro Quartal und je m²

Reinigungsklasse Verzeichnis A

1a zehn Reinigungen pro Woche

0,3670 €

1b sieben Reinigungen pro Woche

0,2569 €

2a sechs Reinigungen pro Woche

0,2202 €

2b fünf Reinigungen pro Woche

0,1835 €

3 drei Reinigungen pro Woche

0,1101 €

4 eine Reinigung pro Woche

0,0367 €

Reinigungsklasse Verzeichnis B

0,0367 €



III. Financing model

Expences and income

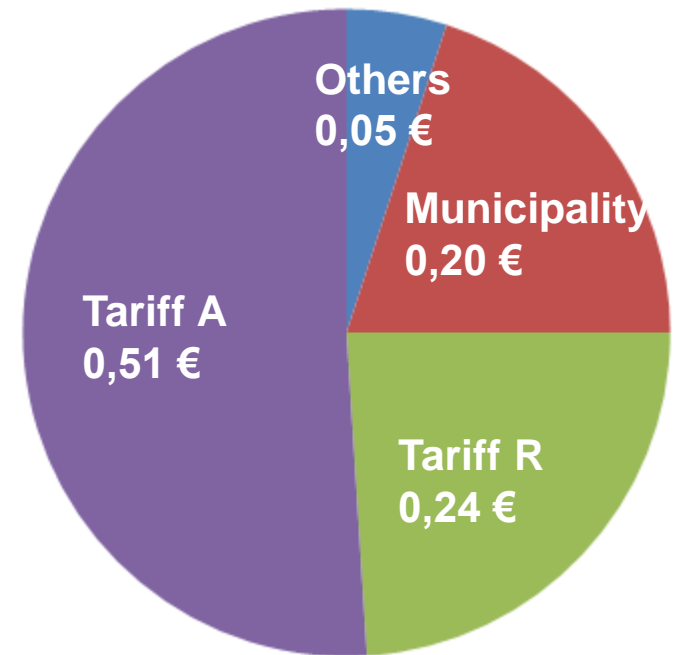
One Euro



Type of costs

BSR business	Euro
staff costs	0,57
material costs	0,08
removal of waste	0,13
depriciation costs	0,13
other costs	0,09
primary costs	1,00

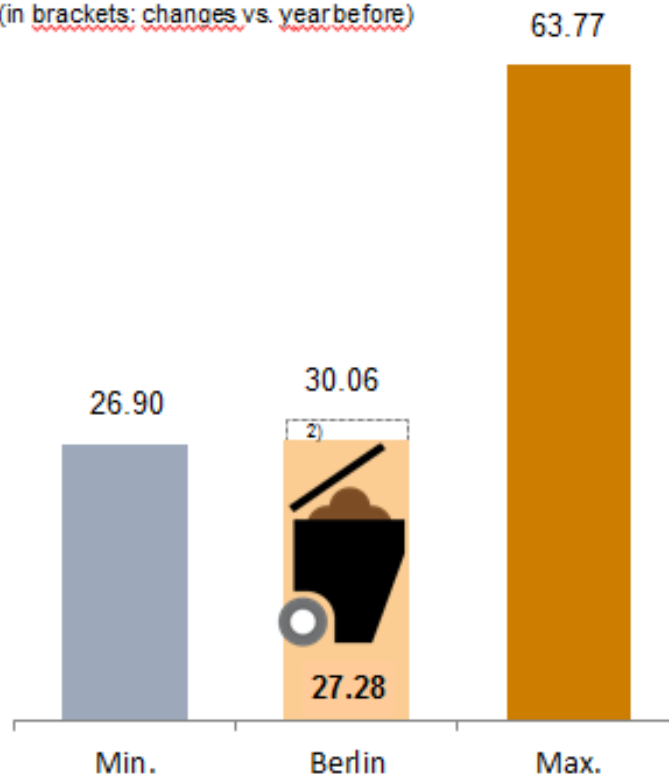
Cost unit



III. Financing model

Benchmark

(in brackets: changes vs. year before)



	<u>city</u>	€ per m ³
	Düsseldorf	63,77
	Frankfurt a.M.	62,74
	Essen	48,39
	Dresden	37,80
	Potsdam	33,37
	Berlin	27,28
	München	26,90

New BBU-Ranking reflects the implementation of a household-related Basic Fee that leads to a higher price within the setting (model house consists of 30 households).

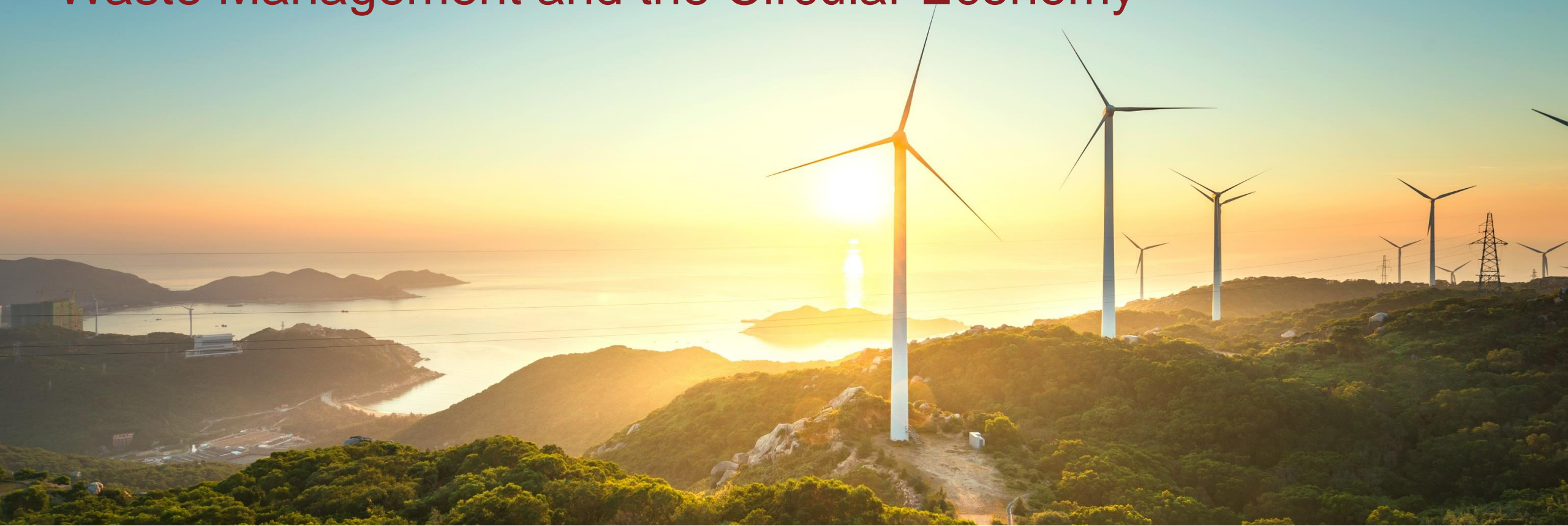
1) Source: BBU Pressespiegel (1.1.2017) 2) incl. collection of paper and cardboard = 30.06 m³



Thanks for your attention



AIIB's Urban Strategy, Waste Management and the Circular Economy



Business and Financing Models for Low-carbon Integrated Solid Waste Management Session

Integrated Waste Management Symposium GIZ, China

8 Sept 2020

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As at November 10, 2019 unless otherwise stated.

AIIB's Future Corporate Strategy* – Thematic Priorities

Our future investments will prioritise one or more of the following thematic priorities:-

- i. Green Infrastructure – Projects that deliver local environmental and developmental improvements, dedicated to climate action
- ii. Connectivity infrastructure – Projects that connect markets within and between countries, across Asia, between Asia and rest of the world
- iii. Technology-enabled infrastructure – Projects where application of technology delivers better value, quality, productivity, resilience, inclusion, transparency and governance.
- iv. Private investment mobilization – Projects mobilizing private finance into sectors within AIIB's mandate

AIIB'S KEY OPERATIONS / PROGRAMS

Range of instruments offered

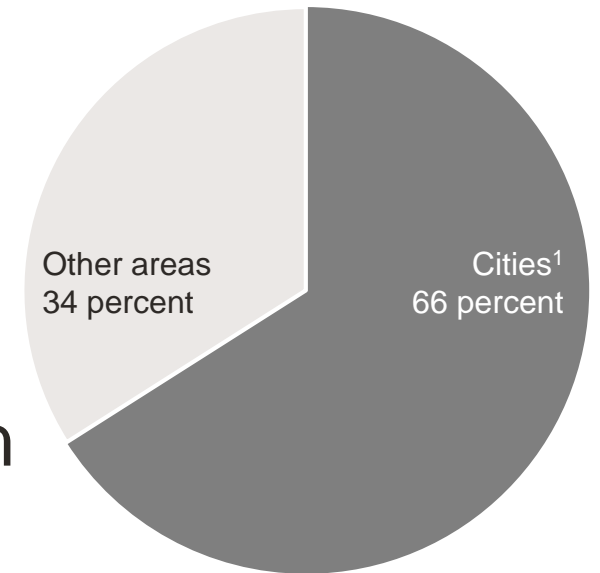
Sovereign loans	Non-sovereign backed financing	Equity Investments	Guarantees
<ul style="list-style-type: none"> • Sovereign-backed loans will have an average maturity of up to 20 years and a final maturity limit of up to 35 years. • Co-financed sovereign lending will be encouraged. • Appraisal of sovereign loans will take into account a full assessment of the project's benefits, risks and borrower implementation capacity. 	<ul style="list-style-type: none"> • AIIB is taking a progressive approach to building its book of non-sovereign backed financing. This approach is based on sound banking practice. • Borrowers could range from sub sovereign entities to private enterprises. • The terms and conditions will be set on a commercial basis and reflect the expected risk to AIIB and market conditions. • Loan amounts can be up to 35% of the project. 	<ul style="list-style-type: none"> • AIIB will only consider making equity investments under terms it considers fair, where clear potential exit strategies are present, and where an acceptable internal rate of return is projected. • Limit on Equity investments up to 10% of available capital. • The Bank expects to play the role of a minority investor and shall not seek a controlling interest in the target entity or enterprise. 	<ul style="list-style-type: none"> • AIIB aims to offer guarantees. • Projects involving guarantees will be appraised, processed, and monitored the same way as loans. • For capital headroom and exposure management purposes, guarantees will be treated as if they were on the balance sheet (i.e. treated the same way as loans).

The case for cities = 2/3 rule

BY 2030,

- ✓ **2/3** of world population will live in cities,
- ✓ They contribute more than **2/3** of global GDP,
- ✓ They account for **2/3** of global energy consumption and
- ✓ Emit **OVER 2/3** of global GHG emissions.

Cities' contribution to Asia's GDP Growth
(2015-2025)



AIIB SUSTAINABLE CITIES STRATEGY

The principles and priority areas guiding AIIB's cities sector engagements.

Support members in **3 priority areas**:

- Enhancing urban **mobility** and **energy** transition.
- Improving **basic** infrastructure and city **resilience**.
- **Integrated** urban development.

Aligned with urban development targets set under:

- Sustainable Development Goals (SDGs)
- New Urban Agenda
- Paris Agreement on Climate Change
- Sendai Framework for Disaster Risk Reduction (AIIB DRR).



Five Guiding Principles

1.Green

2.Resilient

3.Efficient

4.Accessible

5.Thriving

AIIB's Cities Priority Areas

Moving forward,

- Enhance building **own** project pipeline;
- finance **standalone** projects, and
- value-add** to project cycle

Investment areas:

Investment-ready
↓
More complex projects

Enhance urban mobility and energy transition	Improve basic infrastructure and city resilience	Promote integrated development
<ul style="list-style-type: none"> Relates to physical access within city boundaries. Examples: <ul style="list-style-type: none"> Metro; light rail; tram; bus transport; bus rapid transit. Low-carbon infrastructure Multimodal hubs; integrated traffic corridor. Transit-oriented development Street; urban road. Traffic management systems. Renewable energy solutions 	<ul style="list-style-type: none"> Relates to basic service provision, climate action, disaster mitigation/adaptation and urban environmental conservation/protection. Examples: <ul style="list-style-type: none"> Water supply; sewerage; wastewater treatment; Waste Management Urban drainage; storm water management; flood protection; water resource management; sponge city. Energy efficiency; green buildings; green infrastructure. Public rental housing; public spaces. Urban data infrastructure. Social Infrastructure (healthcare) Electricity distribution.² 	<ul style="list-style-type: none"> Relates to more comprehensive/multisectoral developments in a given area; may include social facilities as part of the overall development. Examples: <ul style="list-style-type: none"> Industrial parks; special economic zones. Commercial business districts Neighborhood (slum) upgrading. Urban redevelopment/regeneration. New city/district development; satellite cities.

Cross-cutting principles:

Technology-enabled

Client-driven, outcome-driven and financially viable

Catalyze private capital.

¹ While health and education facilities are important for the sustainable development of cities, AIIB views that such facilities are better managed through a social sector approach. Thus AIIB will not prioritize health and education facilities under this strategy, unless they are part of a broader integrated development that the bank is considering to finance.

² While power generation typically takes place in provincial areas outside of cities, it can have spillover effects on cities (e.g., air pollution). As such, the pursuit of sustainable and green energy, in line with AIIB's energy sector strategy, is also relevant and important for cities.

Circular Economy

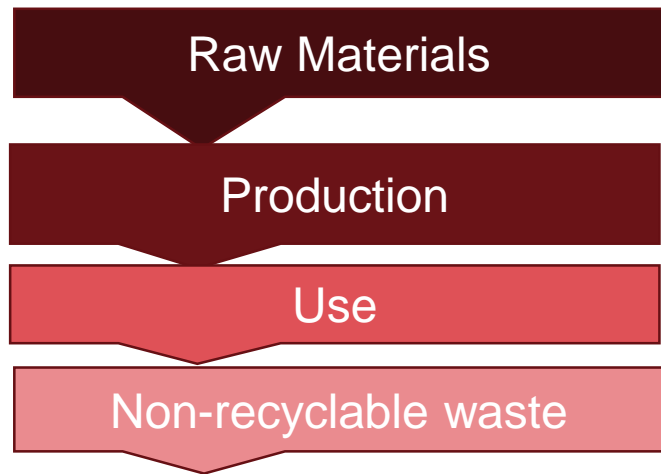
- i. Population growth
- ii. Negative impact – human health, climate change & environment
- iii. UNEP (2019) – 90 bil tons of primary materials extracted and used globally; only **9 %** recycled
- iv. Commercial opportunity – new jobs & industries
- v. Optimize efficient use of resources (energy, water and materials)
- vi. It's not just managing waste – production and consumption
- vii. E. g. roadmap needed – recycle and reduce materials



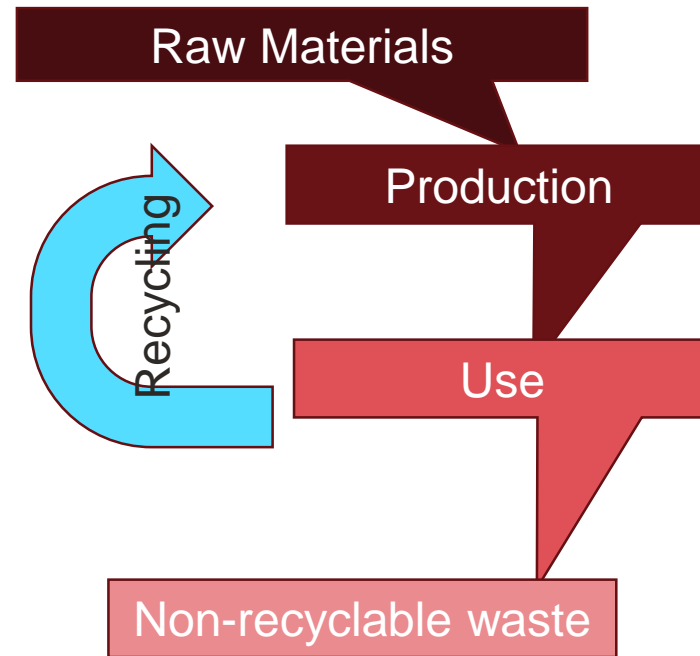
Circular Economy

- From linear to a circular economy

Linear Economy



Reuse economy



Circular economy



Waste Management – Success stories by UNHabitat

Wuhan's Garden expo in Hubei

- i. Originally 46 hectares of landfill for city of 10 mil
- ii. 1989 – 2005
- iii. At closure = 3.7 mil tons
- iv. Restoration started 2012 – expo site
- v. Aerobic ecological restoration technology
- vi. 2015 = C40 Cities Award in Paris



Surabaya, Indonesia

- i. Bus doubles as a recycling collection point
- ii. Bus transports the material to a depot
- iii. Funding from municipal's budget for waste disposal
- iv. Community-driven
- v. Private sector demand for plastic waste – financial viability



Asian Infrastructure Investment Bank (AIIB)

Asia Financial Center
No 1 Tianchen East Road
Chaoyang District
Beijing, China
100101

+86 10 8358 0000
Email: information@aiib.org
<https://www.aiib.org>



Bankability Issues in Waste to Energy Project

Highlight of key aspects



Private Sector Waste to Energy Projects

- Historically private sector has strong interest in waste to energy projects:
 - Strong fundamentals: In Europe, replacement of landfill. Solution to waste management in emerging markets
 - Multiple revenues streams: Gate/tipping fees, electricity, bottom products (small amount)
 - Different business models: PPP, Merchant or hybrid
- But it is a complex sector from financing perspectives:
 - Logistics business
 - Process plant
 - Counterpart creditor quality
 - Change in law

Bankability Issues

- Logistics business:
 - Deliver waste to the gate at the 'right time' and
 - Deliver the 'right waste' to the gate
- Processing plant:
 - Choice of technology is important: Moving grate, fluidised bed or gasifications
 - Waste quality including calorific value
- Counterpart creditor quality:
 - Electricity sale is probably ok
 - Who pay for the gate/tipping fee?
- Change in law:
 - Environmental standards lead to costly retrofitting costs or materially increase operating costs
 - Lost of revenue during the retrofit periods

Waste to Energy Project is a Partnership

- Procurement Authority
 - Gauge how much WTE capacity is needed and then plan a pipeline of projects;
 - Economic feasibility should be based on affordable gate fees and electricity fed-in tariffs if applicable.
- Developers/EPC/Operators
 - Explain the latest development of state-of-the art technology
 - Open to discuss risk issues with Procurement Authority
- Commercial Banks
 - Provide the credit discipline
 - Main source of financing
- Multilateral Development Banks
 - Serve as a bridge between public and private sector
 - Capacity building and
 - Source of financing

Concluding Remarks

- We have only touch upon the surface today;
- We look forward to further interactions and feel free to reach out to us:
 - **Edwin Yuen:** Senior Private Sector Operation Specialist, edwin.yuen@aiib.org
 - **Ping Yean Cheah:** Senior Strategy Officer, ping.cheah@aiib.org
- We wish **NAMA/GIZ** a great success in pushing the waste to energy agenda forward



PPP in
WtE

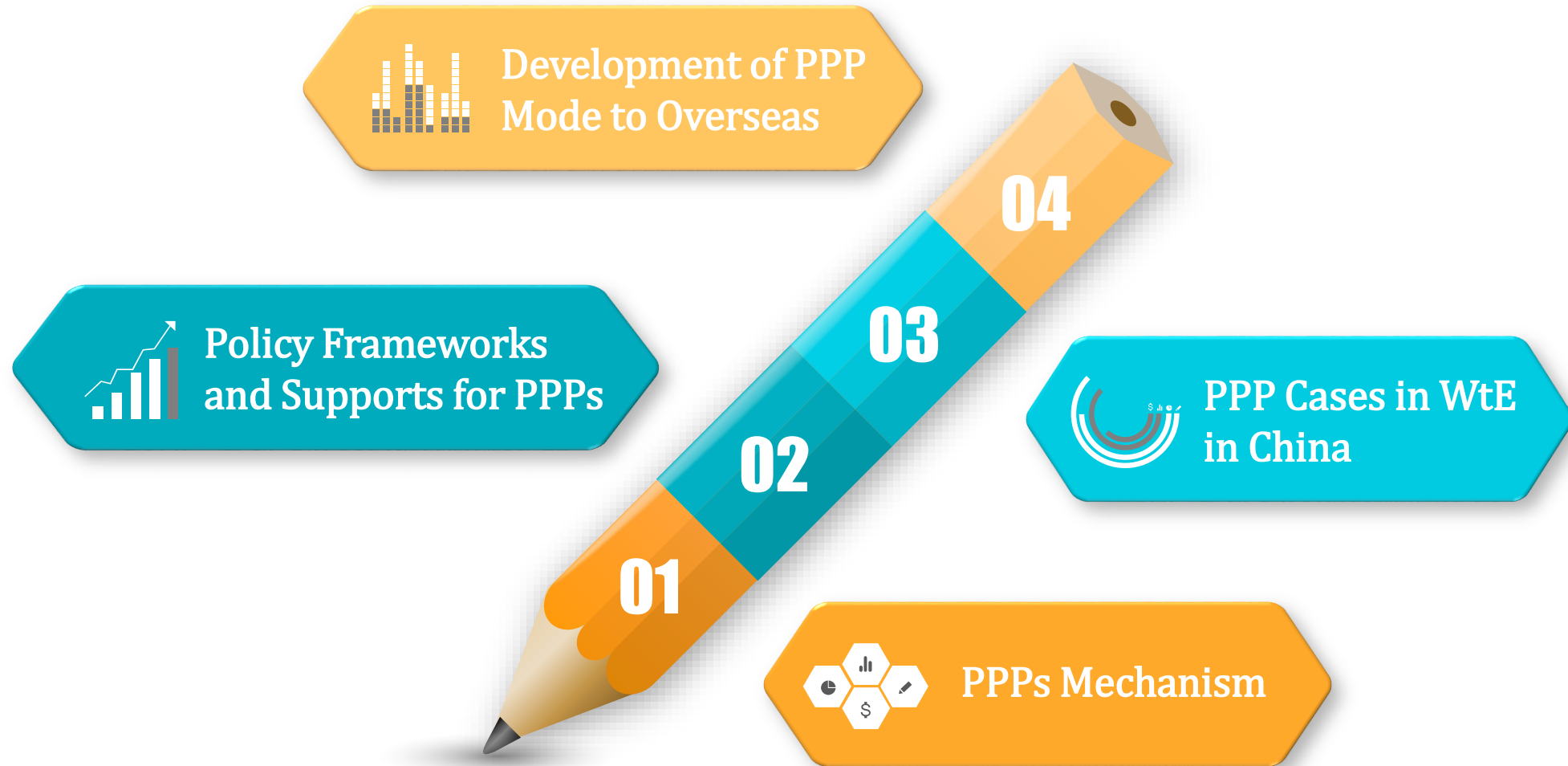


PPPs in Solid Waste Incineration Industry

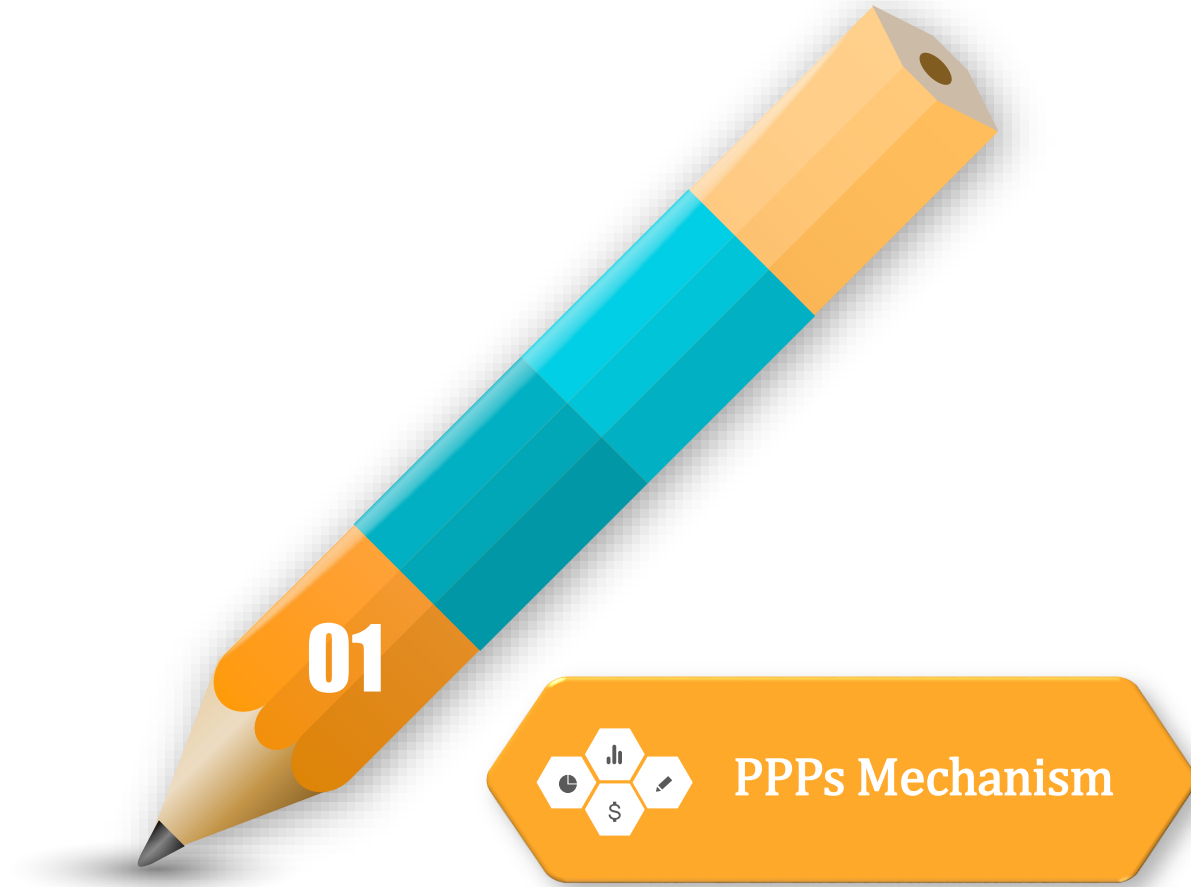
Eric Zhan, SUS Environment

Sep. 8, 2020

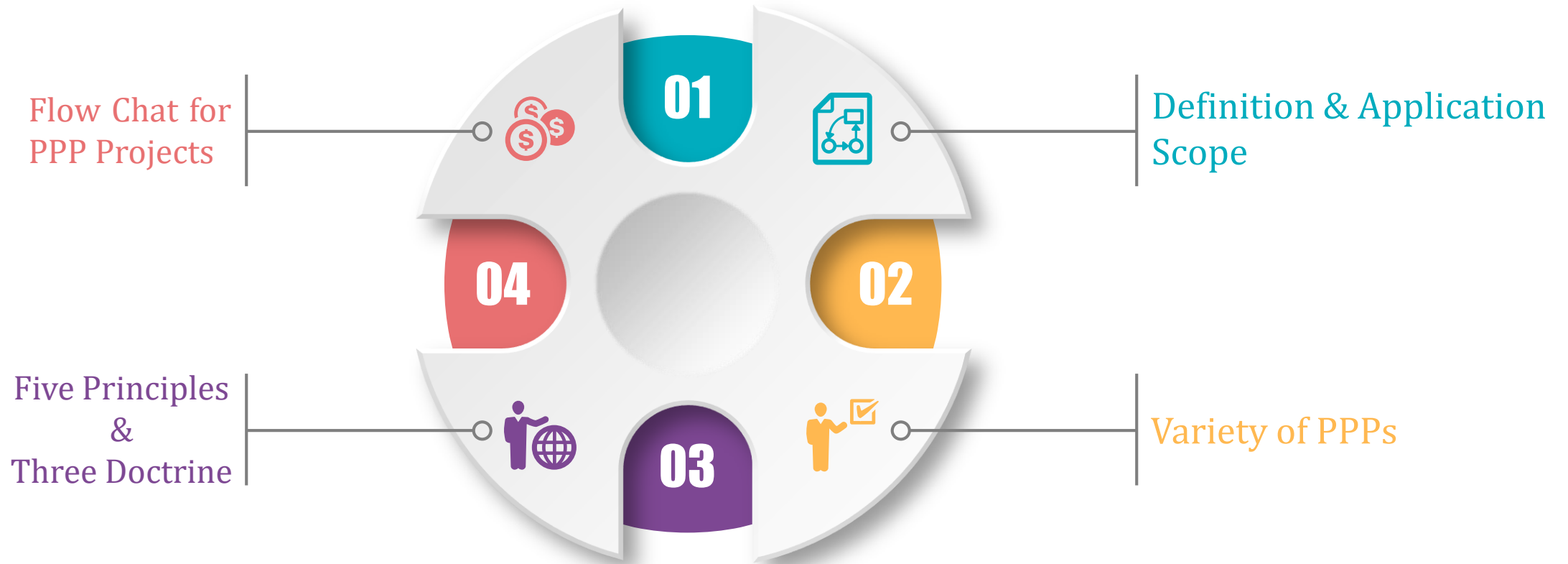
CONTENTS



PPPs Mechanism



PPPs Mechanism



Definition & Application Scope

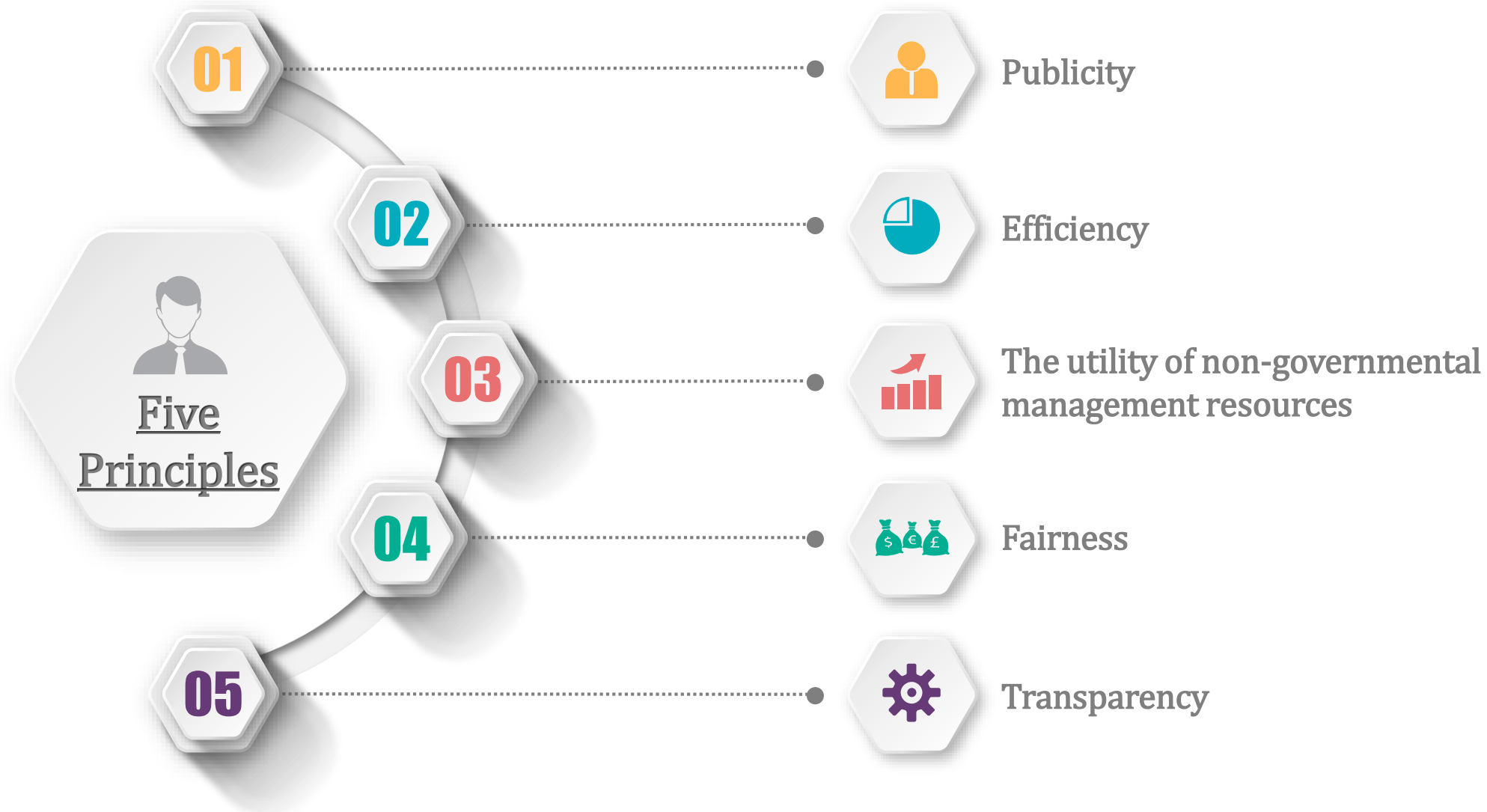
Public-private partnership (PPP) is a long-term contract signed between the government and the private sector to provide public assets or services of public-private partnership, in which the private sector bears significant risks and management responsibilities, and pay is linked to performance.

(Definition from World Bank, <https://pppknowledge.org/ppp-cycle/what-ppp>)

In order to improve the efficiency of administrative services of government departments, all countries in the world are actively entrusting the services of government and administrative departments to private enterprises. The most prominent feature is the introduction of NPM(New Public Management) in order to promote the maximum efficiency of administrative services, that is, the introduction of market and Management mechanism into the administrative service department.

PFI has been applied earlier in the field of road and bridge construction and operation in China. In recent years, more achievements have been made in the field of urban sewage treatment. The application of PPP in the solid waste comprehensive treatment industry started a little later, but is still in the ascendant.

Five Principles & Three Doctrines



Five Principles & Three Doctrines

Three Doctrines



01 Objectivism



02 Contratualista



03 Independent doctrine

Flow Chat for PPP Projects

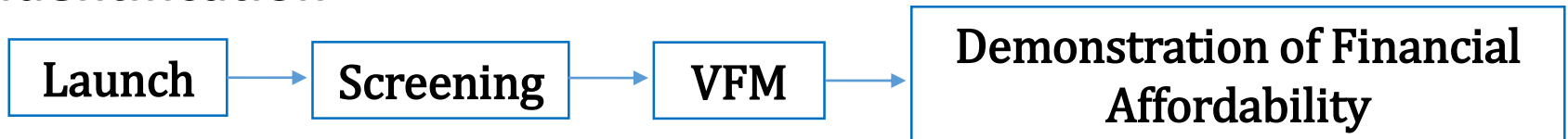
On November 29, 2014, the Ministry of Finance of the People's Republic of China (MOF) issued the Operation Guide for The Cooperation Mode between

Government and Social Capital, which provides guidance for the specific operation process of PPP projects.

*VFM = Value for Money

*SPV = Special Purpose Vehicle

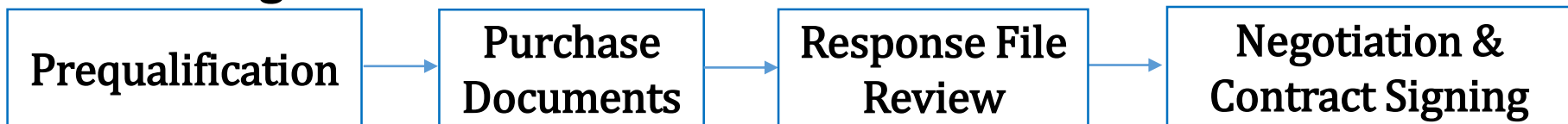
Identification



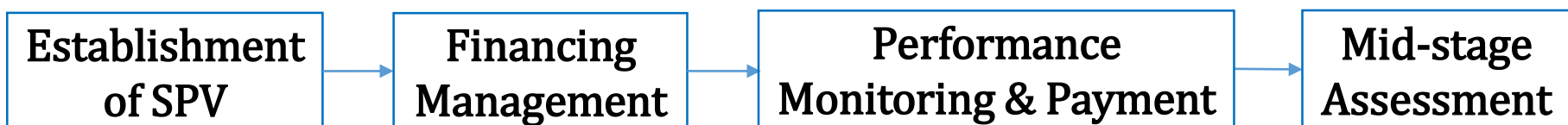
Preparation



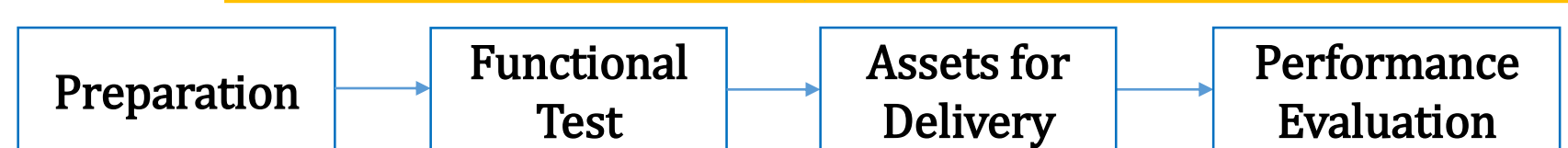
Purchasing



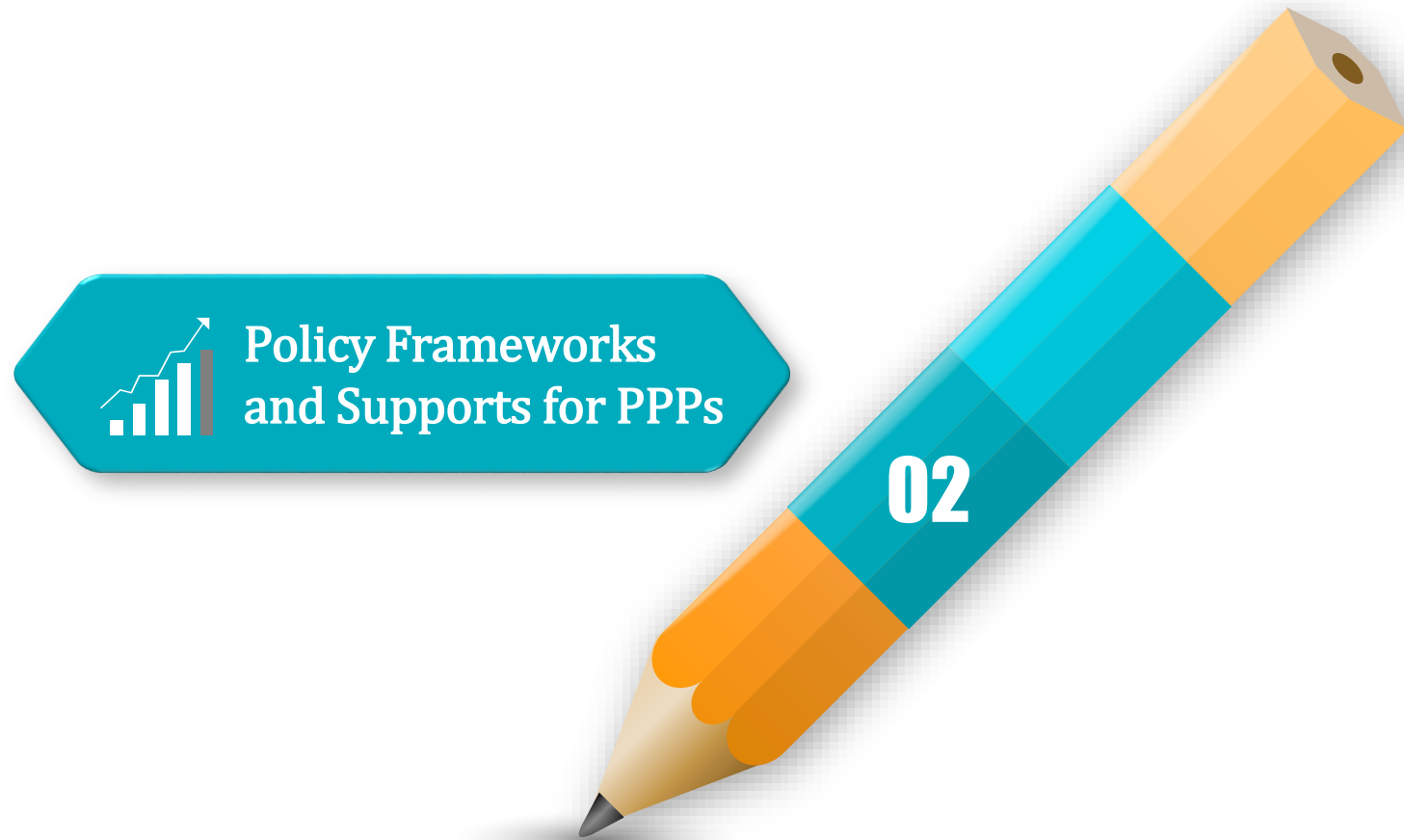
Execution



Transfer



Policy Frameworks and Supports for PPPs



Policy Frameworks and Supports for PPPs

Execution Year	Articles in a Statute	Enacting Bodies
2002	Opinions on Promoting the Industrial Development of Municipal Sewage and Garbage Treatment (Investment [2002] No. 1591)	State Development Planning Commission (SDPC) , Ministry of Construction, State Environmental Protection Administration
2002	Notice on Implementing The Urban Household Garbage Treatment Charge System and Promoting the Industrialization of Garbage Treatment (No.872 [2002])	State Planning Commission, Ministry of Finance, Ministry of Construction, State Environmental Protection Administration (SEPA)
2002	Notice on Accelerating The Preliminary Work of The Project and Actively Promoting the Industrialization of Urban Sewage and Garbage (Planning and Investment [2002] No. 1451)	State Planning Commission, Ministry of Construction and other 5 ministries
2002	Opinions on Accelerating the Marketization Process of Municipal Public Utilities Industry (Jian cheng [2002] No. 272)	Ministry of Construction (MOC)
2003	Administrative License Law of the People's Republic of China	National People's Congress (NPC)
2004	Administrative Measures on The Franchising of Municipal Public Utilities (Order of the Ministry of Construction No.126)	Ministry of Construction (MOC)
2010	Some Opinions on Encouraging and Guiding the Healthy Development of Private Investment (Guo fa [2010] No. 13)	NDRC(National Development and Reform Commission)

Policy Frameworks and Supports for PPPs

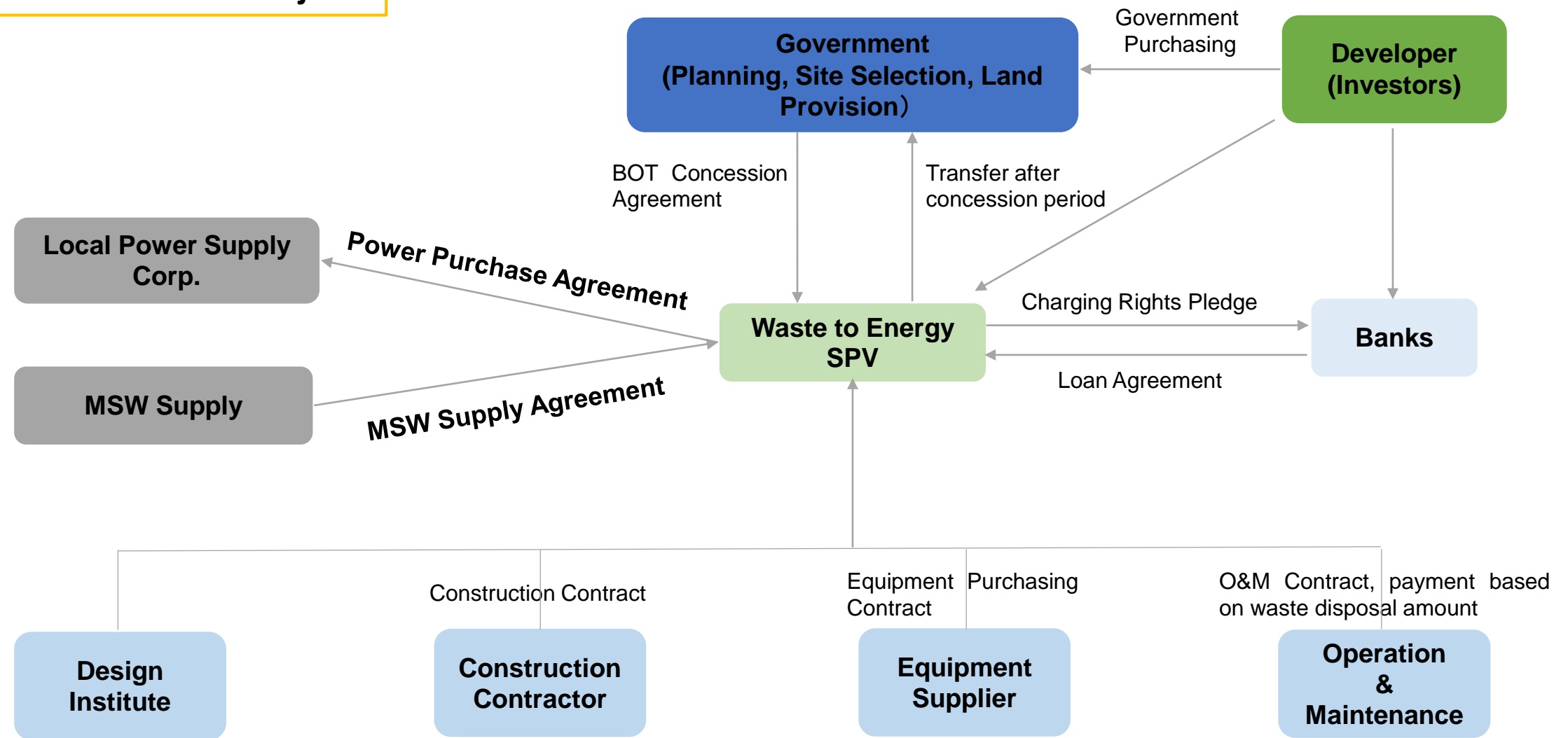
Execution Year	Articles in a Statute	Enacting body
2014	Opinions on Key Tasks of Deepening Economic Restructuring in 2014, Guo fa [2014] No. 18	NDRC(National Development and Reform Commission)
2014	Notice on Releasing the First Batch of Projects encouraging Social Investment in Infrastructure and other Fields (Issue and Reform Foundation [2014] No. 981) - launch PPP80 demonstration projects	NDRC(National Development and Reform Commission)
2014	Opinions on Strengthening The Management of Local Government Debt (Guo Fa [2014] No. 43)	NDRC(National Development and Reform Commission)
2014	Notice on Improving the Implementation Plan of PPP Projects	Ministry of Finance
2014	Guiding Opinions on Innovation of Investment and Financing Mechanisms in Key Areas to Encourage Social Investment (Guo fa [2014] No. 60)	NDRC(National Development and Reform Commission)
2017	Guidelines of the General Office of the State Council on Further Stimulating The Vitality of Effective Private Investment and Promoting Sustainable and Healthy Economic Development	General Office of the State Council
2017	Notice of SasAC on Strengthening The Financial Risk Control of PPP Business of Central Enterprises	State-owned Assets Supervision and Administration Commission (SASAC)
2017	Guidelines of the National Development and Reform Commission on Encouraging Private Capital to participate in Public-Private Partnership (PPP) Projects	NDRC(National Development and Reform Commission)

PPP Cases in WtE in China



PPP Cases in WtE in China

Mode of WtE PPP Project



PPP Cases in WtE in China

Ningbo Mingzhou Municipal Solid Waste-to-Energy (WtE) Project

Project Introduction

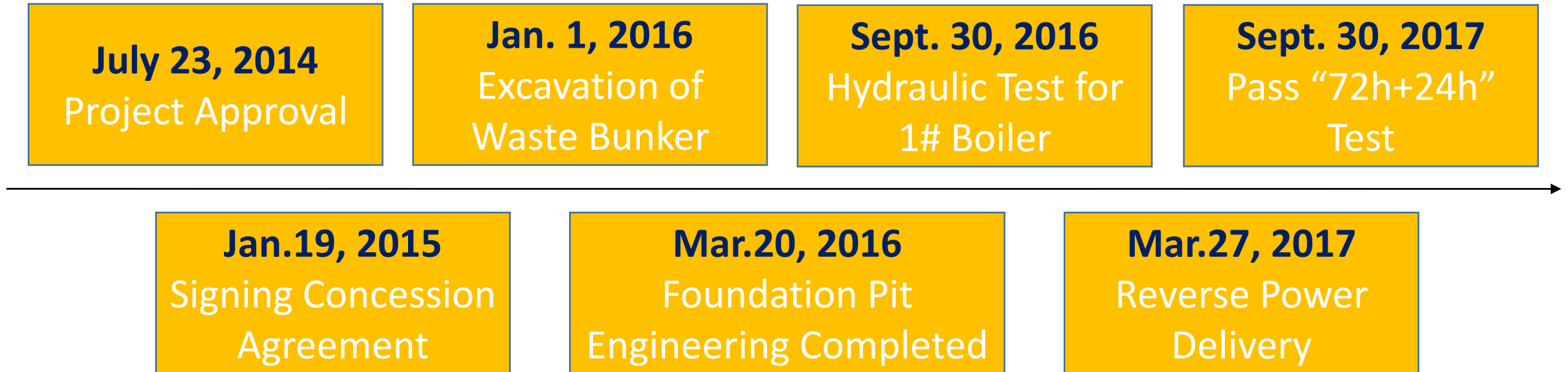
- PPP demonstrative project of the Ministry of Finance.
- Including WtE plant, landfills, kitchen waste treatment plant, food waste treatment plant and leachate treatment plant.
- Daily MSW treatment capacity of 2,250 t/d and annual MSW treatment capacity of 820,000 tons.
- The adoption of the strictest flue gas treatment process: SNCR (selective non-catalytic reduction) + Semi-dry scrubber+ Dry scrubber + Activated Carbon Injection + Bag Filter + SGH (steam-gas heater) + SCR (Selective Catalytic Reduction) + Wet scrubber + GGH (gas-gas heater). The flue gas emission is stricter than Directive 2010/75/EU and the Standard for Pollution Control on the MSW (GB18485-2014).
- The first MSW treatment museum in Ningbo with an aim of environmental protection, popular science education, and international exchange.
- The curtain wall system is designed by a French firm AIA Associés and inspired by the honeycomb.



PPP Cases in WtE in China

Ningbo Mingzhou Municipal Solid Waste-to-Energy (WtE) Project

Ningbo WtE Project Construction Milestones



PPP Cases in WtE in China

Ningbo Mingzhou Municipal Solid Waste-to-Energy (WtE) Project

Capital Provision

Total investment: 1.45 billion CNY, including 340 million equity and 1.11 billion bank loan.
Share structure: 88% of private capital and 12% of public capital, both invested in cash.

No.	Names of Entities	Shares in Registered Capital	Remarks
1	Ningbo Yinzhou District Urban Construction and Investment Development Co., Ltd.	12.00%	Representative of Public Entity
2	Shanghai SUS Environment Co., Ltd.	68.00%	Private
3	CITIC Environment Investment Group Co., Ltd.	15.00%	Private
4	Greata Group Co., Ltd.	5.00%	Private
total		100%	

PPP Cases in WtE in China

Qingdao Xiaojianxi Municipal Solid Waste & Sewage Sludge Co-incineration Project

Capital Provision

Concession Period: 30 years (Phase I)

Commercial Operating Date: 8th September, 2019

Installed Capacity: $2 \times 30\text{MW}$

Land Area: 579,336.23 m²

Daily MSW Treatment Capacity: 2250 (Phase I) + 1500 (Phase II) tons/d

Daily Food Waste Treatment Capacity: 100 (Phase I) + 100 (Phase II) tons/d

Flue Gas Purification: SNCR + Semi-dry scrubber + Dry scrubber + Activated carbon injection + Bag filter + SGH + SCR + Wet scrubber + GGH

Project Highlights:

1. Advanced environmental protection mode.
2. Ultra-low emission is stricter than European standard (2010/75/EU).
3. Highly intelligent.
4. Garden-style factory.
5. Open science base.
6. Efficient eco-industrial park mode.



PPP Cases in WtE in China

Qingdao Xiaojianxi Municipal Solid Waste & Sewage Sludge Co-incineration Project

Capital Provision

Total investment: 1.292 billion CNY

Investors: Shanghai SUS Environment Co., Ltd. (34.125%)

Qingdao Solid Waste Disposal Co., Ltd. (0.875%)

Financing Entities: China CITIC Bank (65%)

No.	Names of Entities	Registered Capital Proportion	Remarks
1	Shanghai SUS Environment Co., Ltd.	97.5%	Private
2	Qingdao Solid Waste Disposal Co., Ltd.	2.5%	Private
total		100%	

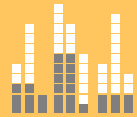
PPP Cases in WtE in China

Qingdao Xiaojianxi Municipal Solid Waste & Sewage Sludge Co-incineration Project

Supports for Sustainable Development Goals

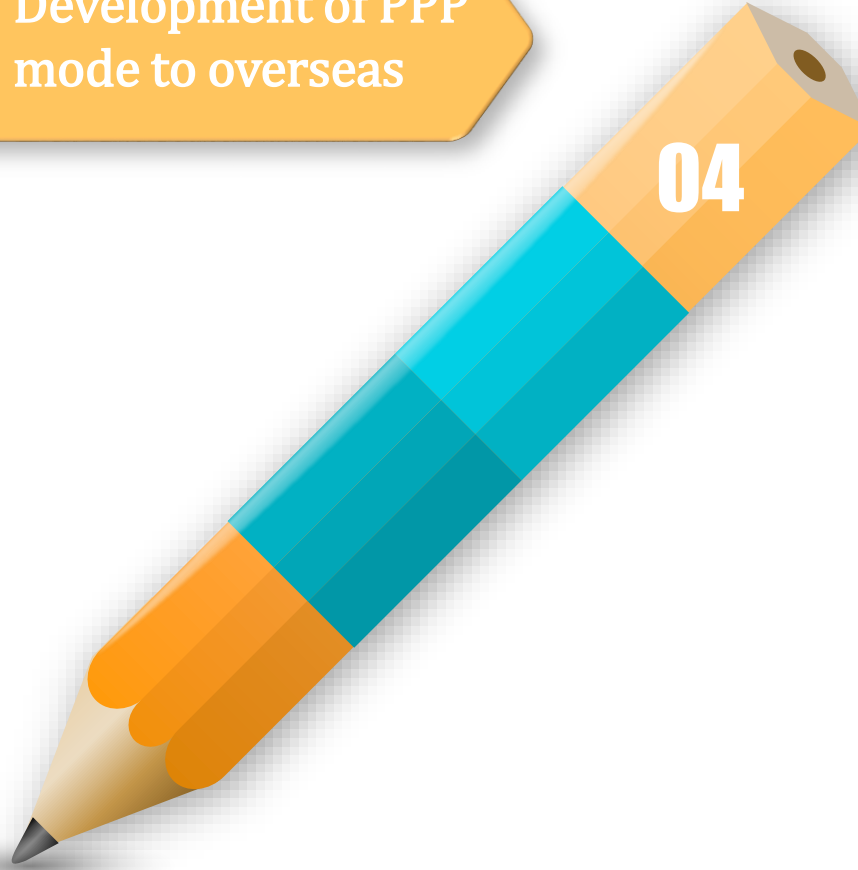
No.	Sustainable Development Goals	No	Partly	Largely	Comments
1	No poverty		•		
2	Zero hunger	•			
3	Good health and well-being for people			•	
4	Quality education		•		
5	Gender equality	•			
6	Clean water and sanitation			•	
7	Affordable and clean energy			•	
8	Decent work and economic growth		•		
9	Industry, Innovation, and Infrastructure		•		
10	Reducing inequalities	•			
11	Sustainable cities and communities			•	
12	Responsible consumption and production		•		
13	Climate action		•		
14	Life below water		•		
15	Life on land		•		
16	Peace, justice and strong institutions			•	
17	Partnerships for the goals			•	

Development of PPP Mode to Overseas



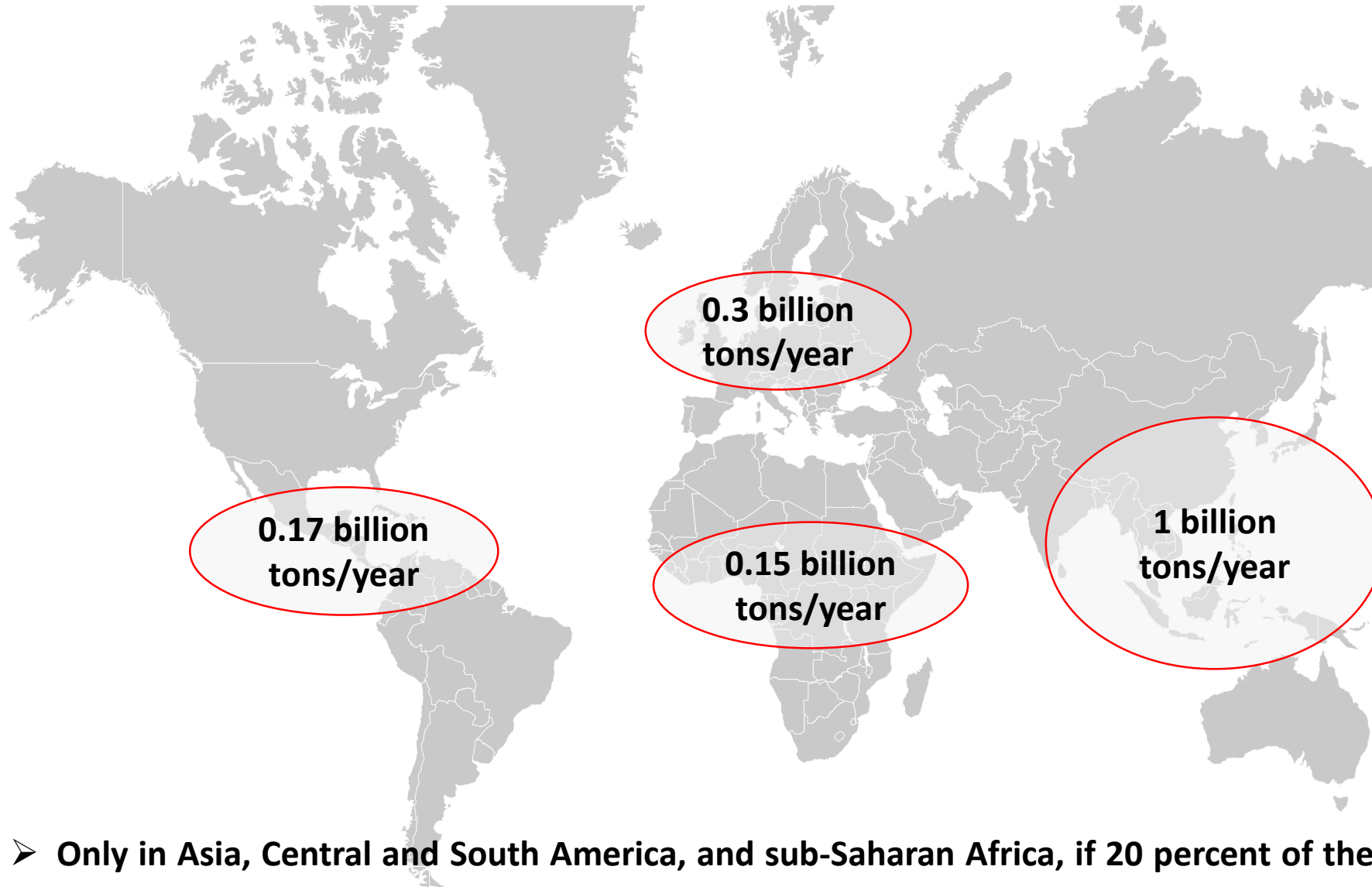
Development of PPP
mode to overseas

04



Development of PPP Mode to Overseas

Is it possible to
INTRODUCE our PPP
mode to overseas WtE
market?



- Only in Asia, Central and South America, and sub-Saharan Africa, if 20 percent of the waste is incinerated to generate electricity, 750 facilities with a daily capacity of 1,000 tons will be needed.

Where Is SUS Going to ? (Global Market)



THANK YOU

