

Forum on Renewable  
Energy and Waste to  
Energy Projects

PPP Centre

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WASTE NOT THE WASTE

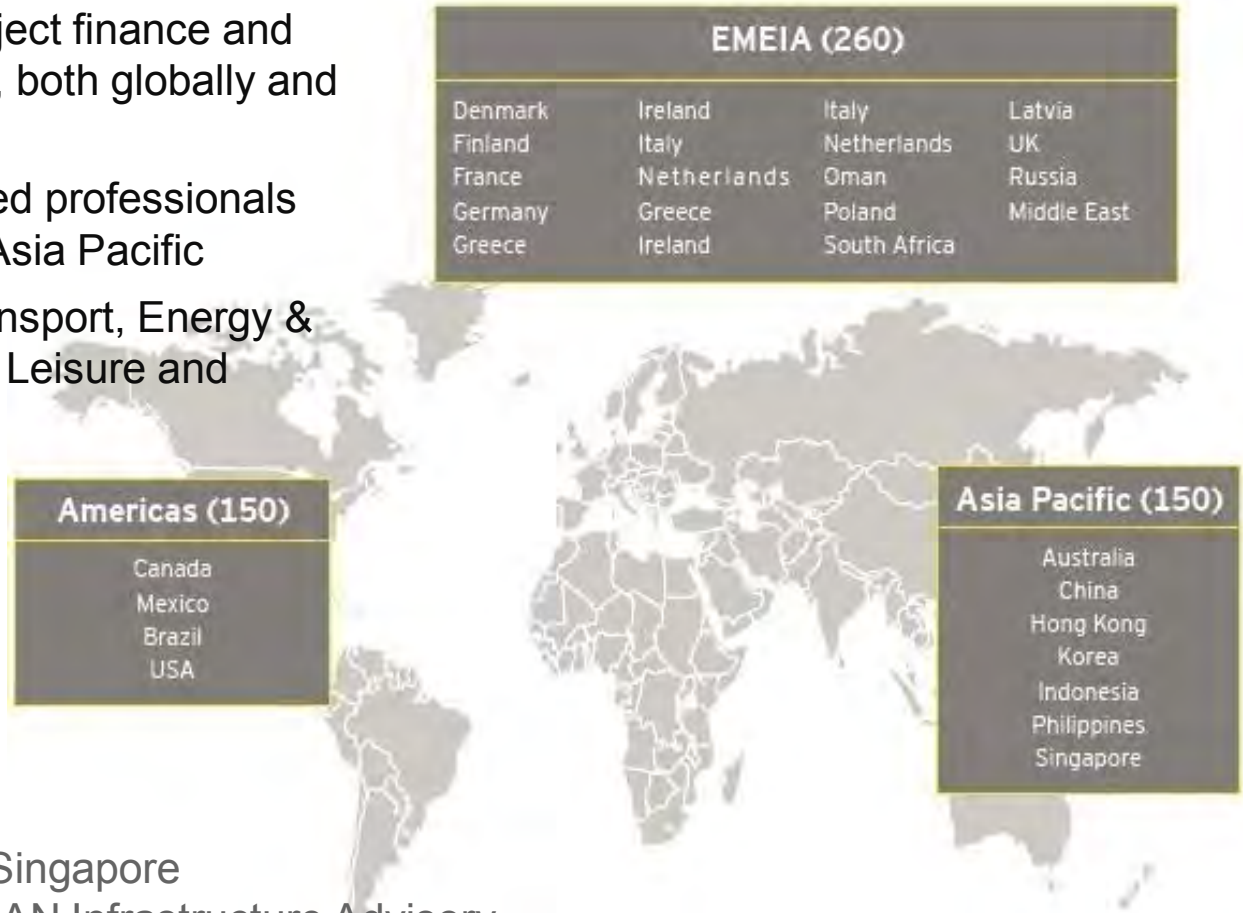
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Building a better  
working world

# EY Project Finance and Infrastructure Advisory Team

- One of the leading project finance and infrastructure advisors, both globally and in Asia
- With over 500 dedicated professionals worldwide, 150 in the Asia Pacific
- Industry experts in Transport, Energy & Utilities, Social Sector, Leisure and Tourism, Real Estate



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Partner, EY Singapore  
Head of ASEAN Infrastructure Advisory

# EY Infrastructure Advisory – Energy and Environmental Finance

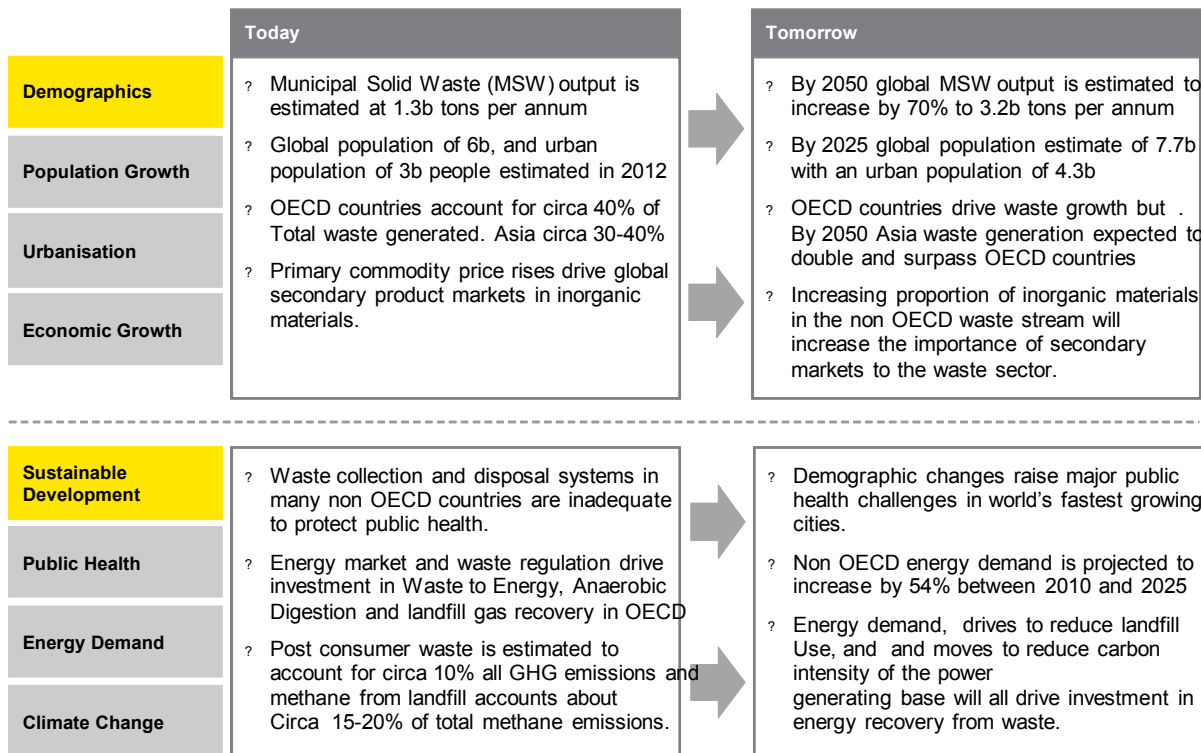
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## What we do: At a glance

- Advise national governments on renewable energy policy and strategy.
- Advise governments on the structuring and implementation of renewable energy and environmental infrastructure programmes.
- Advise developers in structuring and project financing assets across a range of renewables and waste management technologies.
- Advise utilities and developers on secondary market infrastructure M&A transactions.
- Advise major corporates on developing and implementing their energy diversification strategies.
- Advise regulators and private sector clients on the cost of renewable electricity generation and distribution using analytical capabilities and performance measurement techniques.

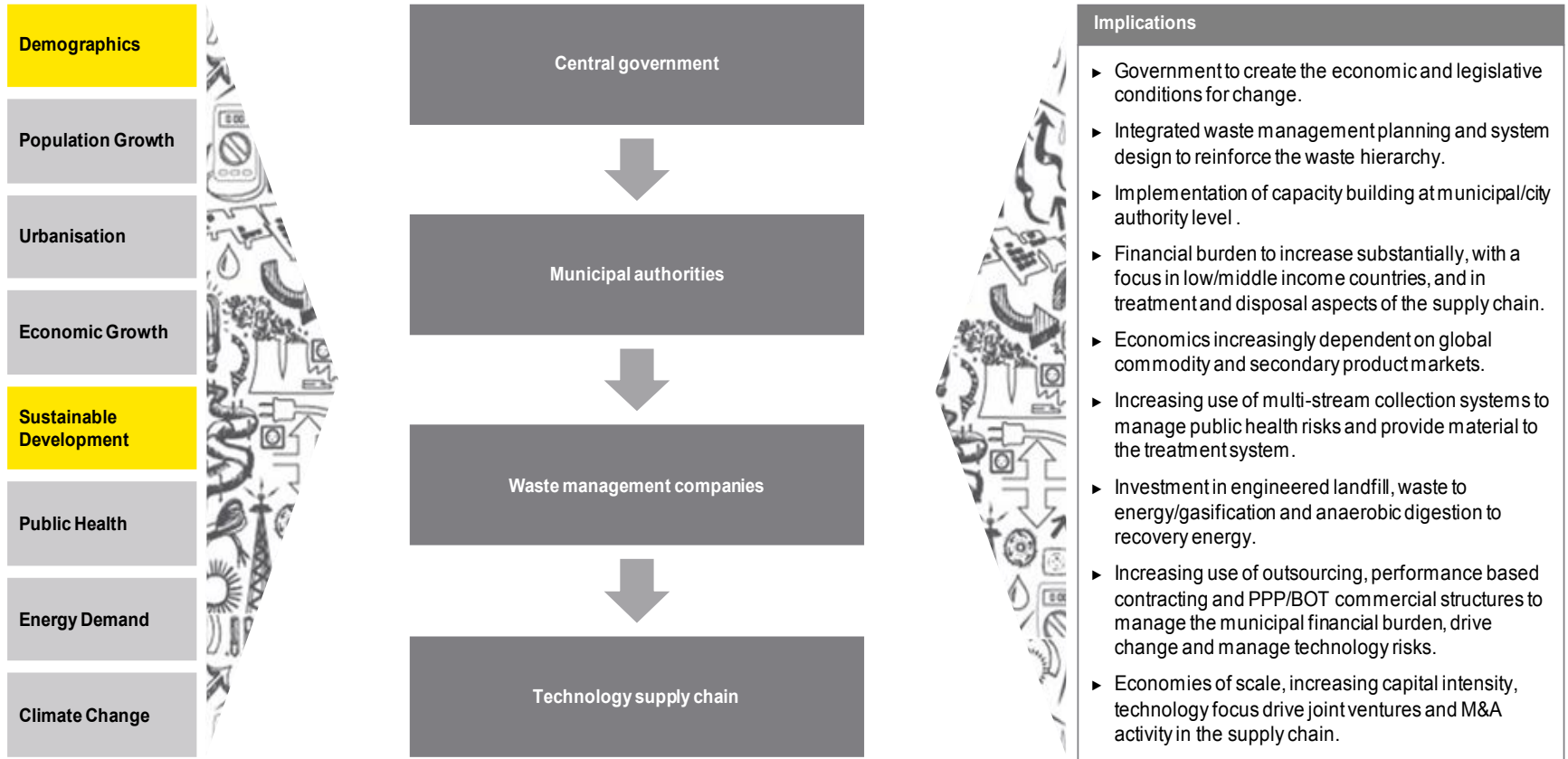
# Key 'mega trends' driving the market

Changes in demographics, through population growth, urbanisation and economic growth and the increasing recognition of the role the waste management sector can play in securing sustainable development are the 'mega trends' driving change in the sector.



# Implications of ‘mega trends’

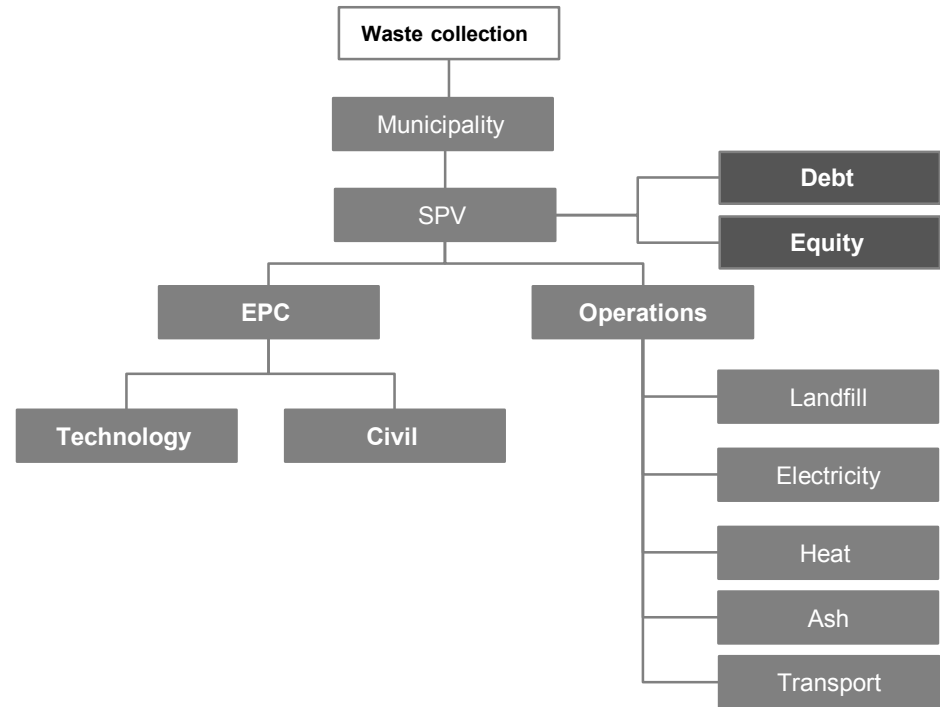
The developments in the sector have generated different considerations and implications for the public and private sector participants.



# Traditional arrangements for PPP in Waste Management

## Key Attributes

- Private sector designs, builds, finances and operates key facilities.
- Funding structure provides a strong link between design, build and operation.
- Risk allocation transfers the balance of design / due diligence, performance, management and project failure risk to the private sector.
- Established market positions, precedent and familiarity amongst contractors, funders, advisers and client side.
- May be underpinned by project or corporate finance.



- Globally, countries including USA, UK, EU countries including Poland, Greece, Russia have developed waste to energy PPP schemes as part of their national waste management systems and policy
- In Asia, China (85 million ton/year, over 200 plants are under PPP) and Singapore (3-4 million ton/year, 5 plants, 2-3 PPP) WtE plants installed under PPP schemes, and other governments including Thailand, Indonesia, Malaysia, Vietnam and Philippines are actively looking to develop similar schemes as part of overall approach to improved municipal waste management.

# Traditional arrangements for PPP in Waste Management

## Key Considerations

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Specific consideration for WtE PPP Projects include:

- Appropriate Technology
- Waste Supply, Composition and By Products ( Ash, Leachate etc)
- Local Authority Credit Risk
- Waste Collection and Transport (including pre-sorting)
- Law, Regulations and Licenses
- Perceived negative environmental and health impact (NIMBY factor)
- ▶ Power Purchase Agreements

• While well managed waste to energy facilities can play a vital role in waste management , WtE schemes face specific issues across the delivery and value chain, starting from the processes for waste collection and sorting, specific environmental and waste regulations to securing renewable energy status eg FIT

# Case Study 1:

## 5<sup>TH</sup> WtE PPP Project, Singapore



# Singapore's 5<sup>th</sup> Waste To Energy Plant Background

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Decision to develop 5th WTE plant using PPP model was part of objective to liberalize incineration industry in Singapore, having successfully built and operated 4 WTE plants, and privatized waste collection service in 1999

- Inject competition into waste incineration sector to increase efficiency
- Develop environment engineering industry by transferring expertise residing in the Government to private sector

The NEA decided to engage private sector under a long-term Public Private Partnership arrangement to deliver public services, to

- Make optimal use of public and private sectors' expertise, resources and innovation • more value for money public services • meet public needs effectively and efficiently
- Shift specific risks to private sector
- Public sector focus on acquiring services at most cost effective basis

The project was first tendered in 2001 and developers to undertake finance, design, operational and demand risk.

Tenders not well received in the market – only one bid received (non compliant)

***Key reason developers unable to bear the demand risk – uncertain waste provision – after taking into account the high capital outlay.***

# Singapore's 5<sup>th</sup> Waste To Energy Plant Procurement Approach

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After a study on commissioned to undertake lessons learnt to develop the project and in 2005, the 5th WTE plant was re-tendered. Key terms:

- 'take-or-pay' approach - with the price determined by competition
- Government to bear demand risks by giving operator full capacity payment, regardless of the actual utilization rate of the plant
- a concession of operating plant for 25 years, private sector raised equity and long term debt financing
- Measurable Performance Outcomes : • Available Incineration Capacity • Contracted unit of electricity export • Ash quality and flue gas to meet standards • Plant service level : EHS, turnaround time, etc. Financial penalties for non-performance

Tender attracted good response from market. Nov 2005 - Keppel Seghers awarded the tender. Plant commenced operations in 2009 and plant operational without any major incidents

***The market's concerns were addressed and allow private sector to bid more competitively***

*The plant is equipped with two incinerator-boiler units with one condensing turbine-generator. Incorporating Keppel Seghers' in-house technologies such as the air-cooled grate and flue gas cleaning system, the plant is able to treat 800 tonnes of solid waste daily to generate about 22 MW of green energy.*

# Singapore's 5<sup>th</sup> Waste To Energy Plant

## Key Agreements

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### Incineration Services Agreement (ISA)

- Government to enter into a long-term 'take-or-pay' ISA with a Special Purpose Company (SPC) set up by the developer to purchase 100% of capacity
- Government to collect gate fee to finance and pay SPC
- Government to mandate electricity is exported to electricity grid
- SPC to deliver services based on tendered/agreed price, technical, commercial, legal terms and conditions and service performance standards □
- SPC to comply with environmental regulations

### Power Purchase Agreement (PPA)

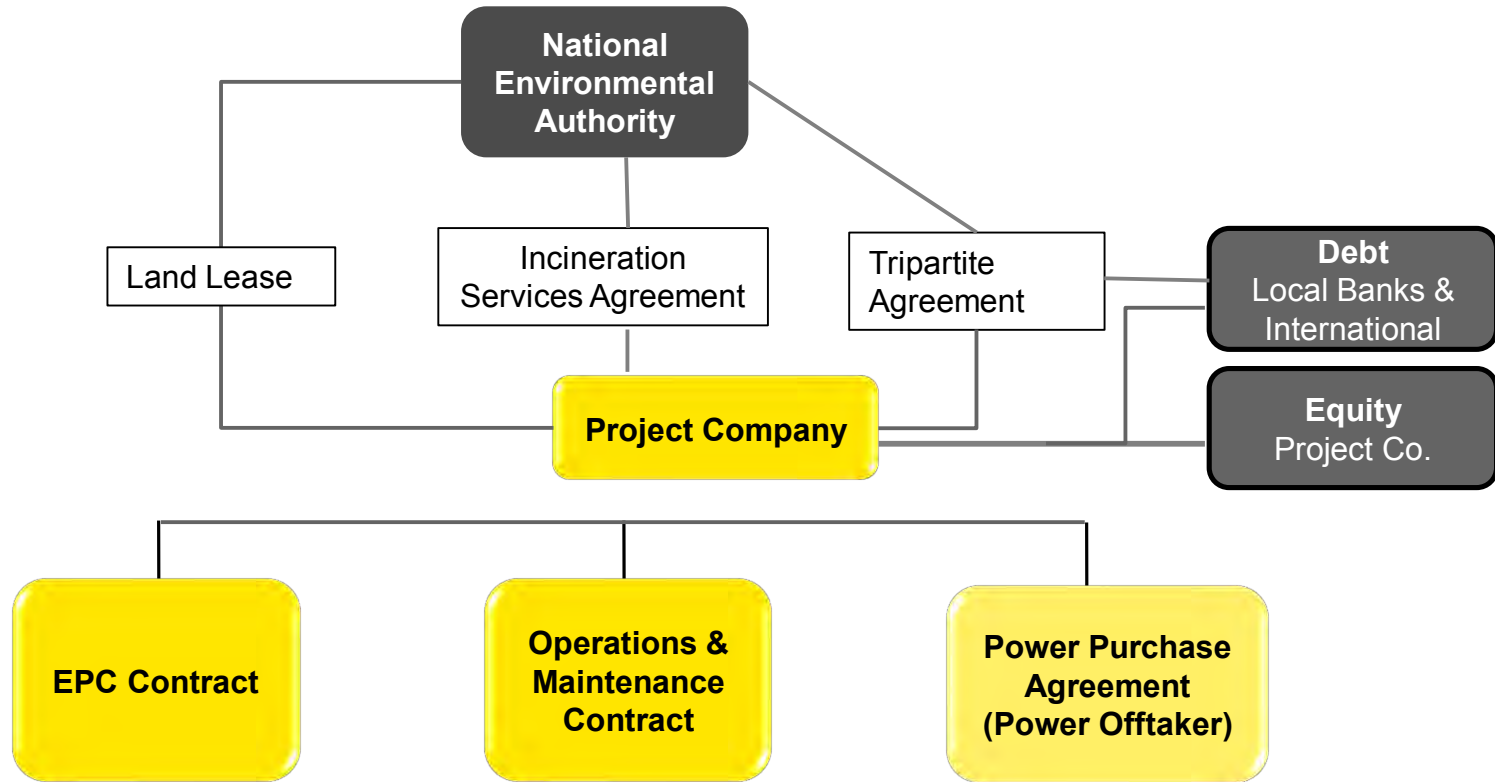
- Export of electricity to grid
- Power revenues to the government
- Technical, commercial and legal terms & conditions

### Tripartite Agreement (TA)

- Financiers may step in and take over WTE plant when SPC is in default
- Government may step in and take over if SPC is unable to render service due to an insolvency event



# Singapore's 5<sup>th</sup> Waste To Energy Plant PPP Contractual Arrangement



# **Case Study 2:**

## **Buckinghamshire WtE PPP, UK**

# Buckinghamshire WtE PPP Project Project Summary

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## Overview

The Buckinghamshire Waste to Energy PPP is a 300,000 tonne per annum waste PPP, which reached financial close earlier in 2013

Our client was Buckinghamshire County Council, the municipal authority responsible for the residual (post recycling) waste of approximately 0.5m residents

The PPP contractor is FCC Environment, which owns 100% of the equity. EPC contract is let to Hitachi Zosen Corporation.

The technology is conventional moving grate EfW technology.

The project is innovative in its financing structure, which reflects an evolution in PPP approach, to recognise unique post-financial crisis circumstances.

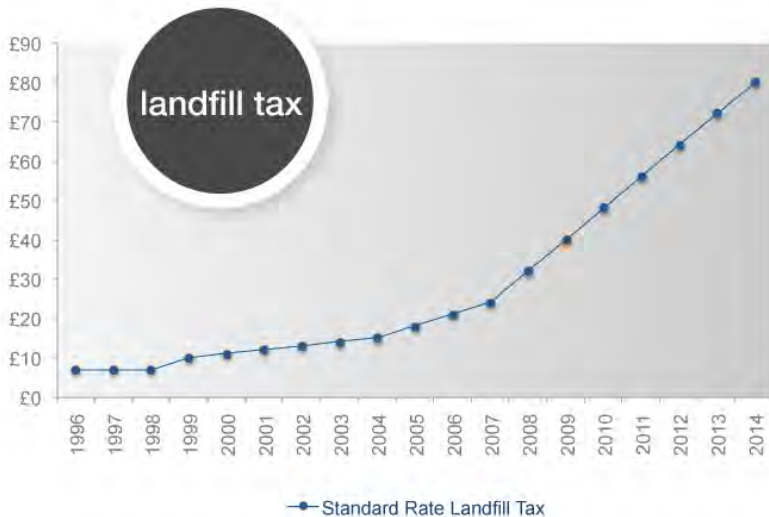


# Buckinghamshire WtE PPP Project

## Project Objectives

### Issue 1: Cost of Landfill

- ▶ To enforce EU landfill directive compliance, national landfill tax rates have, and will continue to increase.



- ▶ **The Client therefore wanted a cost effective residual treatment solution as compared to landfill.**

### Issue 2: Affordability / Cost of Debt

- ▶ Post financial crisis, longer tenor debt margins have increased significantly, whilst underlying swap rates have fallen.
- ▶ Third party debt carries a range of additional costs, through covenants, and importantly by constraining the levels of non-unitary charge income (third party waste and electricity income) that can be used to offset / subsidise the unitary charge.
- ▶ Public sector borrowing remains relatively cost effective, and capital availability at municipal level is good.
- ▶ **The Client wanted a solution that leveraged the benefits of public sector cost of finance as far as possible.**

# Buckinghamshire WtE PPP Project

## Project Objectives

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### Issue 3: Value for money

- ▶ PPP contracts have a rigorously and carefully developed balance of risk transfer, which protects value for money for the public sector
- ▶ In Waste to Energy projects the key risks are perceived to be in the technology, and in the construction phase, and in realising third party income forecasts.
- ▶ In PPP projects funders play a key role in monitoring and enforcing performance, and create the link between construction and operations phases.
- ▶ **The Client wanted to preserve the balance of risk transfer in a traditional PPP / DBFO project as far as practical.**





# Buckinghamshire WtE PPP Project Solution

## The Solution

The private sector finances the construction phase using equity and construction finance (short tenor) loans

Debt is refinanced by the public sector during operations.

Equity remains in the project vehicle for the duration of the project.

An enhanced guarantee structure from the operator manages differential risk exposure

## Why it works

The private sector takes full construction phase risk (as per standard PPP project) on a conventional, 'bankable' technology.

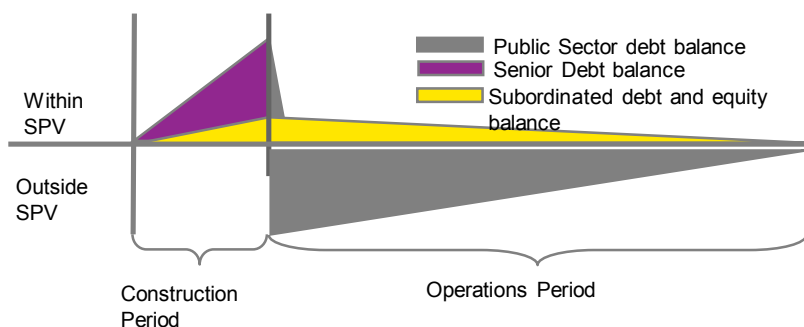
Short tenor construction finance debt is lower cost than longer tenor project finance debt.

Debt is refinanced by low cost public sector debt during operations, once construction and technology risks are resolved

The absence of operating phase debt allows project to make a better offer on third party income.

Equity remains in the project vehicle for the duration of the project to incentivise performance and link construction and operation phases.

Range of contractual protections cover risk transfer gaps.



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**Thank You**