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Cost recovery and tariffs setting. MS experience. Estonia

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Polluter pays principle

In environmental law, the **polluter pays principle** is enacted to make the party responsible for producing pollution responsible for paying for the damage done to the natural environment.

It is regarded as a regional custom because of the strong support it has received in most Organisation for Economic Co-operation and Development (**OECD**) and European Community (**EC**) countries.

It is mentioned in Principle 16 of the Rio Declaration on Environment and Development.



Polluter pays principle – distant ideal and practical implementation

In ‘clear cut’ would polluter pays principle mean, that Waste management should be financed fully in ‘business-as-usual’ approach:

- Any cost, investments etc. should be covered by companies or other actors, based on loans etc or their own means – and redeemed through the service fees.**



Polluter pays principle – distant ideal and practical implementation (2)

- **In real life hardly implementable in the Countries, where waste management needs huge investments within short time for the Basic infrastructure, but where general income level does not allow to direct all related costs to the initial waste holder.**
- **It means, ‘polluter pays’ principle should be implemented step by step, starting from all ‘running costs’, then covering the investments components also.**



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Cost's components



Where from to start?

Hence, the 100 % 'cost recovery' is not always possible in short term

Costs recovery could be looked from two ends:

- **Waste holder's fees** -> initial collection costs incl. separate collection on site, transport, transfer stations, recycling yards -> treatment facilities -> recovery and disposal facilities
- **Recovery and disposal facilities 'gate fees'** -> amortisation of the initial investments, operational costs, closure and aftercare of landfills



Cost of the landfill of waste

Landfill Directive (1999/31/EC) Article 10

Member States shall take measures to ensure that all of the **costs involved in the setting up and operation of a landfill site**, including as far as possible the cost of the financial security or its equivalent referred to in Article 8(a)(iv), and the **estimated costs of the closure and after-care of the site for a period of at least 30 years shall be covered by the price to be charged by the operator for the disposal of any type of waste in that site.**

Subject to the requirements of Council Directive 90/313/EEC of 7 June 1990 on the freedom of access to information on the environment(9) Member States shall ensure transparency in the collection and use of any necessary cost information.



Cost of the landfilling – real life

- New landfill were build on **1999-2006** with the large financial support from the State, ie. those grants should not be repaid.
- ‘gate fees’ of the landfills are **25-30 €/t + landfill tax 30 €/t = 55-60 €/t**
- This gate fee is paid to the landfill company by company, who delivers the waste to the landfill
- ‘Gate fees’ are not controlled by the public authorities, but set by landfill companies, which are mostly under the control of Municipalities.



Cost of the landfilling – real life (2)

- Landfills are also companies - they can't allow losses for longer period of time, ie 'gate fees' should cover the actual costs (incl. future obligations).
- Although financial support, it could be concluded, that landfill price of **25-30 €/t in (excl. LF-tax)** in average covers the costs of landfilling on new landfills, IF the landfilling capacity is **>100 th t/y.**



Cost of the energy recovery of the mixed municipal waste – real life

- No significant investment support was delivered to the energy recovery solutions – as landfilling gate fee **50-55 €/t** was convincing and triggered the investments to the recovery solutions.
- On 2014 ca **6 %** from the total MSW was landfilled, on 2010 it was **70 %**.





Cost of the energy recovery of the mixed municipal waste – real life (2)

- The gate fees of the Waste-to-Energy (WtE) and MBT facilities are in direct competition situation ca **30-35 €/t**, WtE gets also 'green energy' and co-generation subsidies – without it would be **40-45 €/t**.
- **Those prices are 'all costs included'**
- It's cheaper, then landfill gate fees, hence is economical not to landfill.





Cost of the recycling

- High variation by different materials streams, dependent from the general market prices for metal, paper, plastics etc.
- Waste treatment costs also depend from the purity of the source-separated materials, after-sorting etc technological choices etc.





Cost of the recycling (2)

- In general does the pre-treated (aftersorting etc) material price cover the costs of collection of all metals, paper and cardboard, when collected in settlements
- Mixed plastic waste (packages etc) does often have negative value, if to consider also collections costs



Cost of the recycling (3)

- Bio-waste: high-quality composting costs ca **40 €/t** (ie more, then incineration!), could be lower if local requirement level is lower (analyses, screening, air-emissions, output Quality standard etc).
- The market price of compost – ca **5 €/t**, when in sold in bulk





Transfer-stations costs

- Mixed municipal waste, when transported to facilities **> 50 km** away, may require change of transport, ie transfer stations
- Usual collection truck takes a load **6-7 t**, average costs of transport **1 €/km**,
- It means for example per **100 km** trip $2 \times 100/7 = \mathbf{28,5 \text{ €/t}}$
- If loaded to the special pressed containers (truck+trailer), up to **38 t** is allowed.
- Then are the costs $2 \times 100/38 = \mathbf{5,2 \text{ €/t}}$



Transfer-stations costs (2)

- But transfer station itself is an investment + operational costs
 - it needs good calculation, when (distance, also waste amounts, waste types etc) is transfer station solution justified.





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Organisation of Municipal waste collection



Municipal Waste Collection

Under Waste act, are Municipalities **obliged to organize a municipal waste collection scheme, based on tenders:**

- to set up list of waste holders (waste holders register i.e. households, companies)
- to define service packages (volume of the collection) on waste management, incl terms for source separation – households can choose the service package





Municipal Waste Collection (2)

- **organize a tender** and pick up a best service offer, within a contract period (up to 5 y) is only contract Partner allowed to collect municipal waste in the given area
- the waste holders, which were not exempted from the system by Municipality, are **counted 'as joined'**, and **charged** according to minimum package of service
- the prices have come down in the towns, on some places even remarkably (**50-60 %**), but in the Country-side, it could not be so....
- **The service prices to the households are based on the results of the tender, ie. There is no institution needed, to adopt the service fees.**



Municipal Waste Collection (2)

Municipality defines 'service packages' and technical conditions

- This means types of containers (or other equipment used for collection), size of containers
- Collections frequency minimum on one-family houses – if on the property has options for composting, then could private houses get collections frequency reduced to **4 x in year.**
- Otherwise minimum **once per 4 weeks**





Costs coverage in tenders based collection model

The collection companies make their offers, where usually for every containers size (waste bag) is offered price, sometimes is offered prize for '1 m³ of collection' – best offer gets the contract up to **5 y** period, in area with up to **30 th** inhabitants.

In fact should company itself calculate, with which prices they can offer the service and on the same time pay the costs of waste, they deliver to the receiving facilities, each of those with their own gate fee.



Costs coverage in tenders based collection model (2)

As prices are for collection volume, but treatment prices are for weight, should the companies itself evaluate the average density on collection.

In statistics, where needed, it is assumed **0,12 t/m³**, but on one-family houses it is usually less.

Within **10 y**, only couple of occasions, where collection company have not been able to offer the service on the contracted conditions, ie. 'offered too low price'.

Minimum number of Containers and frequency of collectionin dwelling houses in Tallinn

Number <- mixed municipal waste
and

-> <- bio-waste -> <- paper

| Korterite arv | 240 l ja 370 l segaolme | | 600 l ja 660 l segaolme | | 800 l ja 1100 l segaolme | | | | 2 500 l segaolme | | | | 4 500 l segaolme | | | 140 l-240 l biojäätmed | | | | 600 l paber ja kartong | | |
|---------------|-------------------------|---------|-------------------------|---------|--------------------------|---------|---------|---------|------------------|---------|---------|---------|------------------|---------|---------|------------------------|---------|---------|---------|------------------------|---------|---------|
| | 1 x ndl | 2 x ndl | 1 x ndl | 2 x ndl | 1 x ndl | 2 x ndl | 3 x ndl | 4 x ndl | 1 x ndl | 2 x ndl | 3 x ndl | 4 x ndl | 1 x ndl | 2 x ndl | 3 x ndl | 1 x 2 ndl | 1 x ndl | 2 x ndl | 3 x ndl | 1 x 2 ndl | 1 x ndl | 2 x ndl |
| 5-9 | 1 | 1 | 1 | | 1 | | | | | | | | | | | | | | | | | |
| 10-29 | | | 2 | | 1 | | | | | | | | | | | 1 (240) | | | | 1 | | |
| 30-49 | | | 4 | 2 | 3 | 2 | 1 | | | | | | | | | 1 (240) | 1 (140) | | | | 1 | |
| 50-79 | | | 6 | 4 | 5 | 3 | 2 | | | | | | | | | 1 (240) | 1 (140) | | | | 2 | |
| 80-99 | | | | | 6 | 3 | 2 | | 2 | 1 | | | 1 | | | | 1 (240) | | | | 2 | |
| 100-119 | | | | | 7 | 3 | 2 | | 3 | 2 | | | | 1 | | | | 1 (240) | | | 3 | |
| 120-139 | | | | | 8 | 4 | 3 | | 3 | | 1 | | 2 | 1 | | | | 1 (240) | | | 3 | 2 |
| 140-169 | | | | | 10 | 5 | 4 | 3 | 3 | 2 | 1 | | 2 | 1 | | | 3 (240) | 2 (140) | 1 (240) | | 4 | 2 |
| 170-189 | | | | | | 6 | 4 | 3 | 4 | 2 | | | 2 | 1 | | | 3 (240) | 2 (140) | 1 (240) | | 5 | 3 |
| 190-209 | | | | | | 7 | 5 | 3 | 4 | 2 | | 1 | 2 | 1 | | | 3 (240) | 2 (240) | 1 (240) | | 5 | 3 |
| 210-229 | | | | | | 8 | 5 | 4 | | | 2 | 1 | 3 | 2 | 1 | | 4 (240) | 2 (240) | 2 (140) | | 6 | 4 |
| 230 ja enam | | | | | | 9 | 6 | 4 | | 3 | 2 | 1 | | 2 | 1 | | 4 (240) | 2 (240) | 2 (140) | | | 4 |

collections
per week



Assumptions on collection frequency table

Minimal household – 1,5 person, average 2,3 persons

Generation of the :

mixed municipal waste – 5,2 l/d/inh

Bio-waste – 0,57 l/d/inh

Paper – 1,4 l/d/inh

Mixed municipal waste volume – 240 l per household per month



Municipality set price model, used in Tallinn on some Districts

City Governments have had two level service tenders:

- 1) On treatment facility (MBT or WtE), getting fixed price there**
- 2) On collection, where collection company gets paid only for pick-up of given number of containers and delivering the waste to the given treatment facility**

Municipality pays directly for the treatment and separately for collection. Service fees for collection are calculated by municipality.



**Collection prices in Tallinn,
where City Government
have set the prices, collects
fees and pays itself to the
collection company**

Collection prices- Tallinn City model

| District | North-Tallinn |
|-------------------------------|----------------------|
| | Kalamaja-Paljassaare |
| Contracted collection company | Ekovir OÜ |
| Valid from | 1.02.2013 |
| volume | EUR |
| waste bag 40-150 l | 1,26 |
| 140 l | 2,34 |
| 240 l | 2,58 |
| 370 l | 3,24 |
| 600 l | 4,62 |
| 800 l | 5,40 |
| 1100 l | 7,14 |
| 2500 l | 16,14 |
| 240 l paper and cardboard | free of charge |
| 600 l paper and cardboard | free of charge |
| 800 l paper and cardboard | free of charge |
| 1100 l paper and cardboard | free of charge |
| 2500 l paper and cardboard | free of charge |
| 4500 l paper and cardboard | free of charge |
| 140 l bio-waste | 2,34 |
| 240 l bio-waste | 2,58 |



Division of costs in the dwelling houses

Taking, that collection volume of mixed waste is **240 l/household/month**, it follows through the density **120 kg/m³**, that average weight of container is $120 \times 0,24 = 28,8$ kg

As volume based price for collection of the **mixed waste** in dwelling houses is ca 3-5 €/household, it follows **100- 173 €/t**

It means, that collection makes a rather significant share from total costs



Division of costs in the dwelling houses (2)

On each dwelling houses there is whether:

- 1) Association of the flat owners
- 2) Contracted property services company (deals with cleaning, snow removal, water data, heating, electricity etc – but also with waste), also in municipally owned houses

The actual WM costs are divided between flats based on area of the flat or number of persons living in the flat – each house can decide itself, which option they use.

More usual is ‘based on the square meters’.



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Other costs related



Municipal Waste Collection – three layer system

- 1) **Collections on the site of generation-** responsibility of the waste owner : typically containers, on some cases plastic bags etc- mixed municipal waste, optionally source separated paper and cardboard, kitchen- and garden waste
- 2) **bring-points**, ca 500 m in towns, until some km in rural areas – packages, in some places paper and cardboard, clothes
Packaging containers may be responsibility of packaging organizations
- 3) **Waste stations/ recycling yards** – in towns ca 1-4 km: In country side 10-15 km : Bulky waste (furniture, C&D waste, WEEE tires, garden waste, metals, paper, packaging, HazW from households etc.



Municipal Waste Collection – three layer system (2)

If recycling Yards are very important level of collections – if it does not exist, relevant waste types end up in the mixed municipal waste (WEEE, HazW etc) or be subject to illegal treatment.

Bring system could be replace on certain extend by tighter on-site collections and recycling Yards - economically is bring system part of the optimal collections.

It is nearly impossible to replace fully on-site collection, this collection level should be directly linked to the property (living house)



Other costs

Average municipal waste station/recycling yard costs ca **300**
th €

- Running costs **20-30 th €/y**
- The service areas are very different, but in average it makes **< 0,5 €/household per month**
- Optional, whether to include this also to the costs model, where costs are covered by fees, set by Municipality



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Conclusions



- **Costs recovery of the municipal waste management is possible, but needs step by step approach**
- **The Basic treatment facilities should be considered as ‘normal companies’ and their service fees be set accordingly**
- **Investments supports scheme should be targeted to the issues which will have positive impact to the future – more for recycling, less for disposal**



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Thank You!