



USAID
FROM THE AMERICAN PEOPLE



WRAPPING NOTE FOR METHODOLOGY FOR REGULATION OF LANDFILL TARIFFS FOR HOUSEHOLD SOLID WASTE

2013

The publication was produced for review by the United States Agency for International Development. It was prepared by Environmental (Green) Investments Fund LLC

This research was made possible with the generous support of the American people through the United States Agency for International Development (USAID)

The Author's views expressed in this publication do not necessarily reflect the views of the USAID or the United States Government

Public Private Partnership Development Program - P3DP

42- 44 Shovkovychna Street, Office 11-D

Kyiv 01601 Ukraine

Telephone/Fax: +38 044 234 3525

www.ppp-ukraine.org

Background

The National Commission for the Regulation of Communal Services in Ukraine requested P3DP to provide technical assistance for developing a tariff setting methodology for municipal solid waste disposal, which includes commercial and institutional solid waste as well as waste from households. Although the mandate of the Commission covers all tariffs for solid waste disposal and processing, the present task looked only at tariff setting for *landfills*. The methodology may be expanded later by the Commission to cover the other aspects of municipal solid waste tariffs.

A new legal framework for solid waste management (SWM) regulation is envisaged by Law No. 5400 (October 2, 2012), “On Amendments to Some Laws of Ukraine on State Regulation for Communal Services”, and Law No. 5402 (October 2, 2012), “On Amendments to Some Laws of Ukraine on Improving Solid Waste Management (SWM) Framework and Enhancing Liability in SWM Areas”. These laws mandate a new approach to SMW tariff setting.

The National Commission for the Regulation of Communal Services (the “Commission”) was founded by Presidential Decree No. 1073/2011 (November 23, 2013). The main responsibility of the Commission is the implementation of state policy, including tariff setting, in the area of communal services: heating, centralized water supply and water disposal. The new laws, cited above, expand the Commission’s authority to regulate the SWM sector, too. The Commission was authorized to develop SWM tariff-setting methodologies, which will be enacted as a Cabinet resolution, and then in more detail as a Commission resolution.

The present note describes the context and summarizes key aspects of the methodology that P3DP developed for the Commission.

Limited scope of the assignment

The present assignment is concerned just with setting the “gate fee” for solid waste disposal at landfills. The gate fee (sometimes called, especially in the U.S., “tipping fee”) is paid to the landfill operator by anyone who delivers waste to the landfill site. The assumption is that all landfills must have a weighbridge and that the gate fee will be charged on a per-tonne basis (where “tonne” means 1000 kg).

The gate fee is only one part of the final tariff to be paid at source by generators of waste – households, businesses, etc. The final tariff also includes components for collection, transfer, and processing of waste before it reaches the landfill.

In a broader perspective, reforms of municipal solid waste management involve much more than tariff setting. Reforms and improvements should ideally start at the top, with an overall policy framework. A panoply of regulatory instruments, both economic and non-economic, and the interaction among them, need to be considered. For example, tariff setting cannot be viewed in isolation from measures to prevent illegal dumping. In addition, other supporting measures, such as grants and subsidies, should form part of the overall policy.

Objectives of developing a methodology for the landfill gate fee

In general, a number of different objectives need to be balanced in setting tariffs for public services. These include issues of economic efficiency, environmental goals, distributional goals, affordability, feasibility of obtaining financing, ease of implementation, transparency, and administrative convenience. Trade-offs can be difficult and contentious.

The questions are more limited and straightforward for the landfill gate fee. The primary objective is for the gate fee to reflect the full financial costs of disposing of waste in the landfill, including costs to be incurred after closure of the landfill. (Other costs to the environment – “externalities” – would not be picked up in the gate fee per se but might be included in a separate landfill tax.) The cost-reflective price for landfill disposal will then be passed through to the waste generator by way of the all-inclusive MSW tariff collected at source. In principle, and if applied correctly, full-cost recovery can help ensure that optimal efforts are made to reduce the generation of waste in the first place and reduce the quantity put to final disposal by encouraging various forms of re-use, recycling, and recovery.

In addition to potentially providing the correct economic signal (depending on how the collection fee is set, of course), providing for full cost recovery is important for fiscal reasons since it avoids having to draw on the general budget of the municipality or national government.

Another important goal of rate setting is to provide incentives to service providers to increase efficiency. For private-sector service providers and in some cases for public-sector providers that are set up as commercial entities, rates can be set in a way that will allow the service provider to gain more if it is able to reduce costs, and this can therefore provide significant incentives.

P3DP’s mandate does not extend to the broad goal of public service tariff reform in itself. However, ensuring that user charges for public services are set in a sound manner is essential for encouraging the involvement of private sector operators and investors, if the private sector company, under a public private partnership (PPP) arrangement, will rely to a substantial degree on revenue obtained from user charges. This is the rationale for P3DP’s involvement in this work. At the present time, one important reason that the private sector is reluctant to invest in landfills in Ukraine is that it does not have confidence in how SWM tariffs will be set and especially whether the investments it makes will be fairly remunerated.

Even though the primary motivating factor for P3DP’s involvement in this effort is the impact on PPPs, the resulting improvements in tariff regulation will benefit all companies operating and investing in landfills – both municipally owned and private sector.

Current practice in Ukraine

Household waste management tariffs are currently calculated according to procedures set out in Cabinet Decree No. 1010/2006, “On Approval of Procedures for the Formation of Tariffs for Removal of Household Waste”. Methodological guidelines for applying the procedures are set out in Decree No. 243 (August 10, 2009), approved by the Minister of Housing and Municipal Economy. Tariffs are calculated separately for collection and disposal services.

The current methodology is a “cost plus” approach in which a “profit” component is added to the sum of eligible costs: operating and maintenance costs, financing costs and depreciation. The eligibility of costs is strongly governed by legally prescribed norms.

Tariffs are estimated annually and regulated through an extensive approvals process. Draft tariff calculations (excluding the “profit” component) are prepared by the responsible communal company and forwarded to the relevant city or Settlement Executive Committee (SEC) for comment. The draft tariff proposal for the waste disposal part of the services (for settlements above 100,000 residents or for landfills accepting 50,000 tonnes or 200,000 m³ or more of waste per year) is then forwarded for review and approval by the Commission. Following approval, the communal company adds a profit component to the approved tariff, which has then to be approved by the relevant oblast Anti-Monopoly Committee. Following such approval, the communal company prepares a draft decision for approval by the city or SEC. This is then set out for public consultation over a 15-day period after which a final decision on the tariff is formally made by the city or SEC.

The “profit” component can be up to 12% of the total tariff. How the “profit” component of the tariff is recovered from users is, however, discretionary: it is typically set at a lower rate for household and budgetary institutions and at a higher rate for commercial entities.

The degree of discretion over how tariffs are currently calculated and regulated can lead to financial uncertainty. A private sector company dependent for its revenue on the periodic decisions of this regulatory process will assess the regulatory risk and determine the extent to which it constrains its participation in the sector. If regulatory risk is high, private sector firms will either add high a risk premium to their price or simply avoid becoming involved in the sector.

In summary, the existing legal and regulatory framework for setting household waste disposal tariffs is multi-layered and complicated. Many of the documents that define rules for calculating specific norms are regarded by participants as outdated or inadequate for application to real practice. The “profit” component of the tariff is arbitrary and unrelated to underlying asset values. The long and convoluted approvals process has serious implications for prices and tariffs, especially in periods of relatively high inflation.

Regulation of landfill tariffs in an international perspective

It is unusual that utility regulators cover SWM tariff setting. Looking more specifically at landfill gate fees, we see that they are typically set in one of two ways in international practice:

- For municipally owned companies, the gate fee and final tariffs are usually set by an annual budgeting exercise based on the expected *cash needs* of the service provider during the coming year. Provisions are sometimes for cash reserves for debt repayment and for heavy maintenance and replacements.
- For private sector service providers, there is typically a long-term contract (PPP contract, in effect if not in name) that sets out the price mechanism and in which the initial (base) price is often set by competitive bidding (competition *for* the market).

For this reason, it was difficult (if not impossible) to base the methodology for Ukraine on the practices of other utility regulators in the world. The approach adopted instead was to use

good economic principles and practice for SWM tariff setting and to adapt it to generally accepted good practice for utility regulation.

Overview of the recommended methodology

The main principles of the methodology are included as an **annex** to the present note. This English-language document was then elaborated more fully in Ukrainian (adding features needed to conform the instrument to typical Ukrainian resolutions of this type) to form the version submitted to the Commission.

In formulating the methodology, an effort was made to conform it to the general principles of the methodologies that the Commission is adopting (or is contemplating adopting) in other sectors. Some of the features that the Commission is tending towards in other sectors, consistent with best practice for utility regulation, are as follows:

- The service provider submits a business plan every few years (e.g. every five years).
- A major tariff review is conducted at that time.
 - The tariff is set based on the costs and other indicators appropriate for a *reasonably efficient operator*.
 - Return *of* investments is dealt with by a depreciation component.
 - Return *on* investments is dealt with by applying an appropriate weighted average cost of capital (WACC) to a “regulatory asset base” (RAB).
- Tariffs are then updated every year in a mechanical way using appropriate formulas and, in some cases, pass-through components.

The basic methodology adopted is what has been called the “building block” method for tariff regulation. The *revenue requirement* for the gate fee is built up by adding together the following elements – all on a forward-looking, expected-value basis for the five future years of the regulatory “control period”, given the assumption of a reasonably efficient operator:

- Operating and maintenance costs
- Profit tax (unless accounted for in the allowed cost of capital by using a pre-tax value)
- Depreciation
- The permitted return on investments, which equals the *regulatory asset base* multiplied by the *allowed cost of capital*
- A fee for landfill closure and post-closure care (to discussed in more detail in the next section)

The gate fee is expressed on a per-tonne basis, based on forecasts for the amount of SWM to be disposed of in the landfill for each future year.

The methodology developed sets out three other kinds of rules:

- Rules for updating the value of the gate fee at the beginning of each year based on price increases of the input values. This is the gate fee that will actually be charged.
- Rules to provide a correction in case the quantity of waste is different from the forecasted quantity. When this happens, certain fixed costs are either over- or under-

recovered because the gate fee is set as a unit (per tonne) fee. So a correction is made in the following year.

- Rules to update the value of the regulatory asset base at the end of one five-year control period to bring it to the value that will be used at the start of the next regulatory control period. It is by these rules that an incentive for efficiency in capital investment is introduced.

Use of the regulatory asset base (RAB) is typical of modern utility regulation following the models made popular in the U.S. (where it is called the “rate base”), U.K, Australia, and now many other countries. The regulator’s commitment to calculate and update the RAB strictly in accordance with the agreed rules is a key feature that can give a private-sector investor assurances that the value of its investment will be protected and that it will receive a “fair return” on its investment. Without this assurance, the private investor will be less willing to invest.

Smoothing the fee over time is a key objective in tariff setting. First, this is important as a way to eliminate changes in the real tariff that result from characteristics (one could say, quirks) in the methodology used and that are not made necessary by the behavior of the underlying costs. Second, even where fluctuations in tariff level might be reflective of underlying costs, it is not helpful for people’s budgets or for planning purposes for tariffs to bounce up and down from year to year or from period to period.

There are different ways that the desired smoothing over time can be accomplished. All sound ways utilize “discounted cash flow techniques”. Some of the ways considered, involving the extensive use of “average incremental cost” calculations, would have been effective, but they diverged too much from standard regulatory practice for utilities, and so it was decided to stay with a more typical building block approach based on a conventional RAB.

Two techniques were introduced into the conventional RAB model to aid in smoothing the gate fee over time:

- Extensive use was made of *quantity-based depreciation* (in which certain capital expenditures are divided by forecast tonnes of waste as opposed to years of life), rather than time-based depreciation. This is appropriate in the context of a landfill, where the useful life of a cell or section of a landfill (requiring capital expenditures for preparation and closure) is more closely linked to the quantity of waste received than to a fixed number of years.
- Smoothing of the capital charge is carried out over the five-year control period using a formula based on discounted-cash-flow principles (where “capital charge” is defined here as the sum of time-based depreciation, return on capital, and profit tax). This prevents the saw-tooth pattern in the gate fee that would otherwise result, given the typical pattern of capital costs for preparing and closing sections of the landfill and the impact on the RAB.

Fee for landfill closure and post-closure care

The fee for landfill closure and post-closure care (see page 4, above) is an important part of the methodology. A financial provision is needed to meet landfill closure and post-closure

obligations. This includes the need to meet remediation (clean-up) costs should adverse events specified in the landfill license occur. It does not include cover of the risk for the future viability of a landfill operator or potential third party claims against it: unless these claims are covered by adequate insurance the cost of the claim may bankrupt the operator. Such third party insurance must be organized and financed separately from the financial provision.

Obligations on the landfill operator typically continue beyond landfill closure, whereby the operator is expected to take any measures necessary to protect the environment. If the operator fails to take the requisite action, or no longer exists in law, then the competent agency may draw upon the financial provision. Financial assurance must therefore be provided in a form that guarantees its provision beyond the existence of the operator. The financial assurance package should therefore name the competent agency as the party able to draw on the financial assurance.

Financial provision must generally be in place for at least 30 years beyond landfill closure. There is typically a strict requirement to ensure that sufficient funds are at all times available under the worst case to cover the costs of immediate third-party closure of the site, third-party post-closure care and third-party performance of remediation actions.

Mechanisms for financial provision must satisfy three core conditions: that the mechanism is secure, the amount of funds is sufficient, and the funds are available when needed. Mechanisms widely used internationally include escrow accounts and surety bonds.

Financial provision is calculated in today's prices and is adjusted annually in arrears during the active life of the facility to account for inflation. Future expenditures must not be discounted to net present values for financing purposes. These factors influence the amount of revenue needed per tonne of waste disposed of to landfill to realize the financial provision and to satisfy the adequacy, security and availability conditions.

A zero real discount rate may be needed to satisfy these conditions. This means that the financial provision has to be provided directly by users (and not partly by investment income). To put this in perspective, the average unit cost per tonne of waste over a 30-year operating period is four times higher if future costs are discounted at 0% rather than at 8%. This has implications for the proportion of the tariff needed for financial provision.

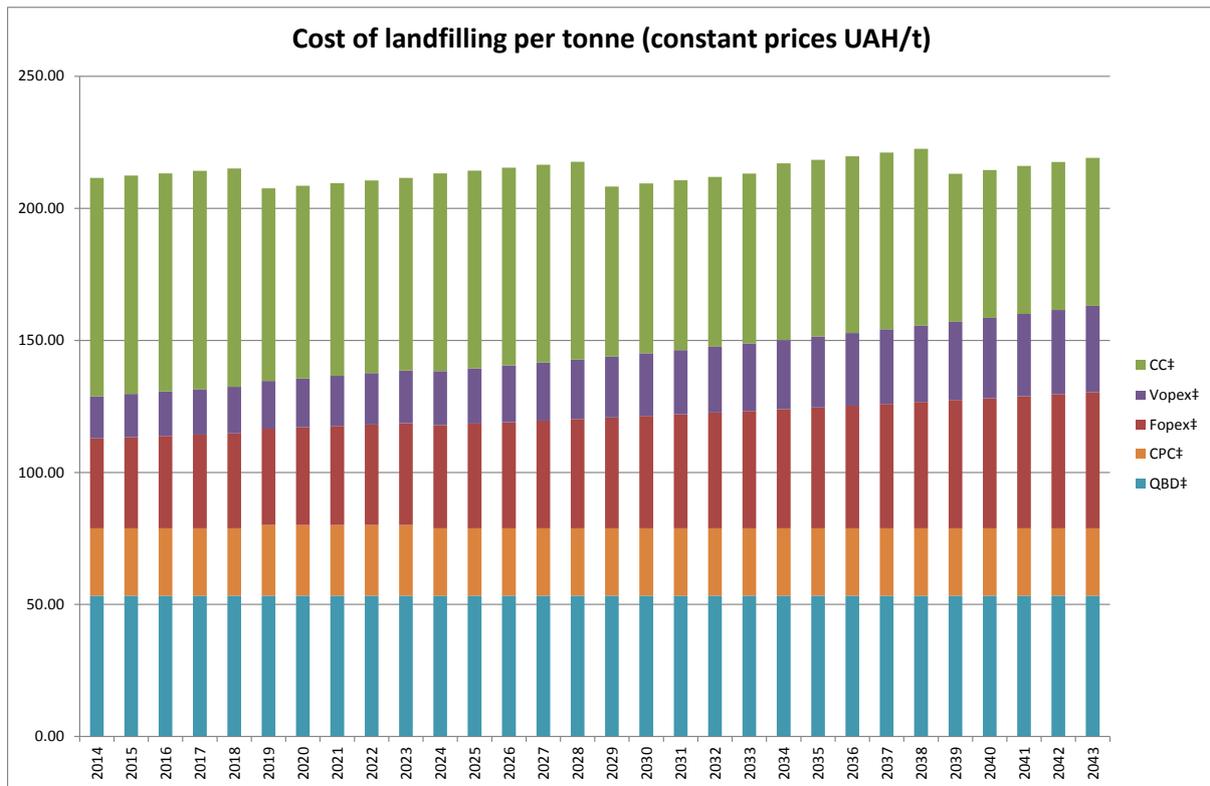
Modeling the methodology

A stylized financial model was created to examine the results of using the methodology. Figures 1 and 2 illustrate the results. They show the gate fee in constant prices of year 2013. This will be referred to as the "real gate fee".

In understanding the results of the model, it should be noted that many landfills are constructed using a modular cell-based approach, for which cell life is typically five to seven years. A financial rationale for this is that it enables the investment burden to be distributed more evenly over landfill life, thereby reducing up-front requirements. Of course, certain costs need to be incurred at the start since they apply to the entire landfill – e.g. roads, water and electricity supply, and administrative buildings. This design feature is captured in the modelling.

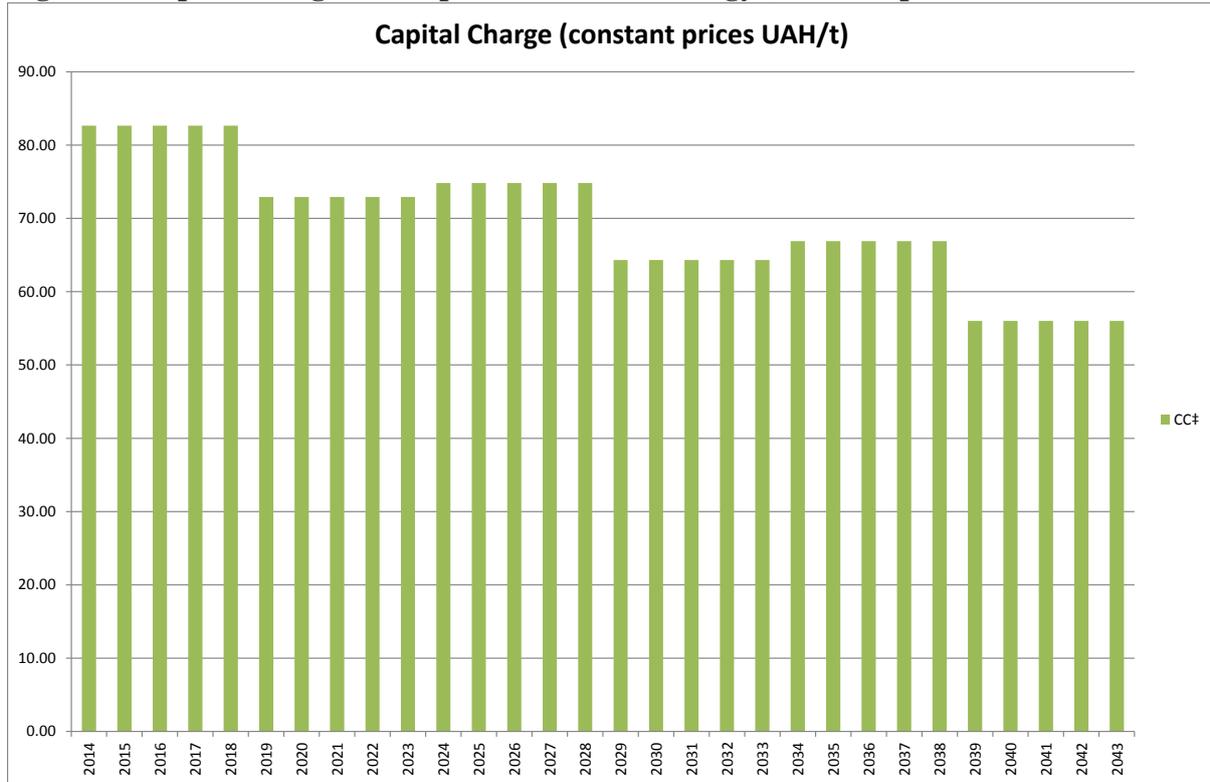
As may be seen in Figure 1, the real gate fee is roughly constant over time – a desirable characteristic. It is interesting to note that a slight increase over time caused by operating costs increasing at a rate that is greater than general price inflation is counterbalanced by a progressive decrease in the capital charge (see Figure 2). This decrease arises because the landfill – unlike, say, a water utility system – has a fixed life. As the end date approaches, assets used for the entire landfill are no longer renewed. The RAB therefore decreases, and so does the return on RAB, a component of the capital charge. This offsetting effect was not an intended feature, but it is a happy coincidence.

Figure 1. Gate fee under preferred methodology (constant prices)



Legend: CC = capital charge; Vopex = variable operating costs; Fopex = fixed operating costs; CPC = fee for closure and post-closure care; QBD = quantity-based depreciation. See page 5 for an explanation of the term “capital charge”

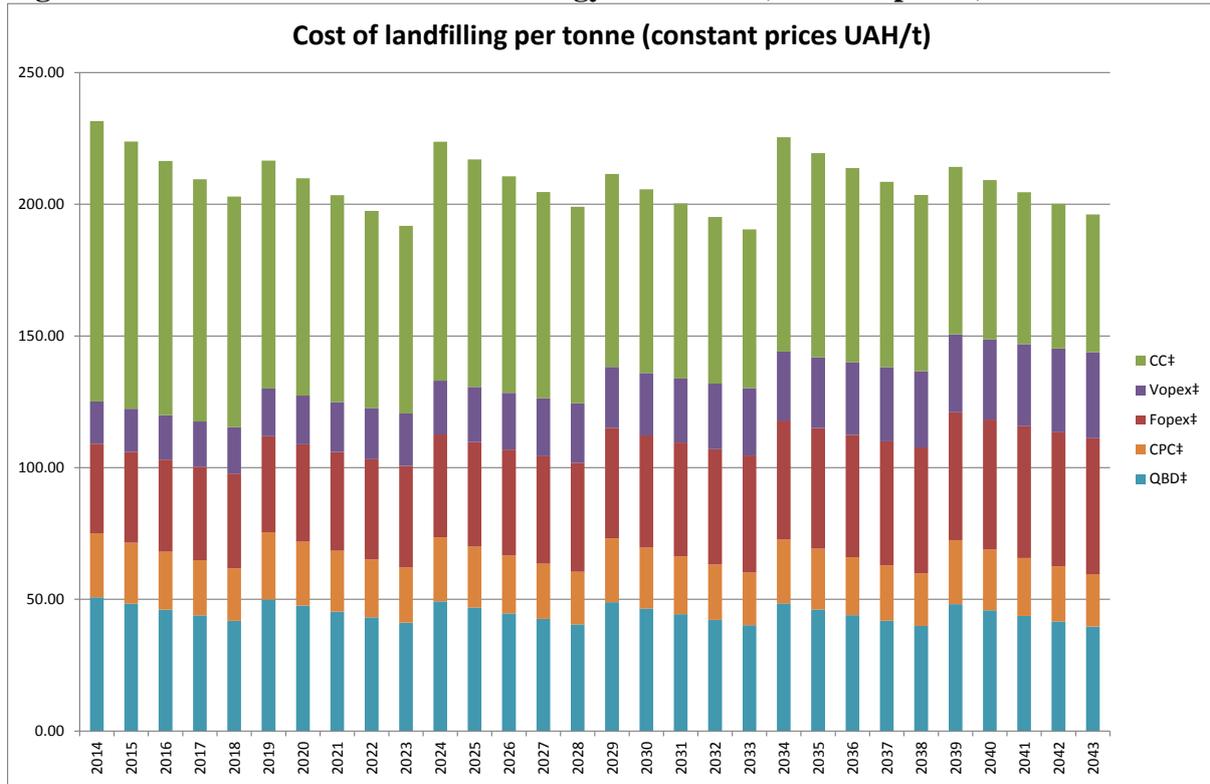
Figure 2. Capital charge under preferred methodology (constant prices)



It is important to note that the capital investment profile of different landfills can be different, and this can have a significant effect on the profile of the gate fee. For example, where a larger share of investment is incurred initially (e.g. where the landfill is constructed in more hilly or mountainous terrain), coupled with lower periodic expenditures on landfill cell replacement, the progressive decrease in the real gate fee over time will be more pronounced because of the larger proportion of the RAB accounted for by investments relating to the entire landfill. But for typical values of general price inflation, it is expected that the gate fee in *current prices* (i.e. the “nominal gate fee”) will generally increase over time.

The discussion above is based on the initial methodology submitted to the Commission. Although the Commission had no objection *in principle* to this methodology, because of certain constraints – including current interpretation of various regulations and precedent in other sectors – the Commission requested certain modifications. The principal changes requested were (i) not to adjust the RAB and the depreciation base by the consumer price index but to use historical values, and (ii) to smooth the capital charge in *nominal* terms (rather than real terms) for each five-year regulatory control period. Although this has the undesirable effect of accentuating the tendencies of the gate fee to decrease in *real* terms both over the entire landfill life and over each five-year control period (as may be seen in Figures 3 and 4), the impact is not severe. Despite the decreases in real terms, the gate fee in *nominal* terms (assuming general price inflation of 5% per year) does not decrease in any year, as illustrated in Figure 5.

Figure 3. Gate fee under final methodology submitted (constant prices)



Legend: CC = capital charge; Vopex = variable operating costs; Fopex = fixed operating costs; CPC = fee for closure and post-closure care; QBD = quantity-based depreciation. See page 5 for an explanation of the term “capital charge”.

Figure 4. Capital charge under final methodology submitted (constant prices)

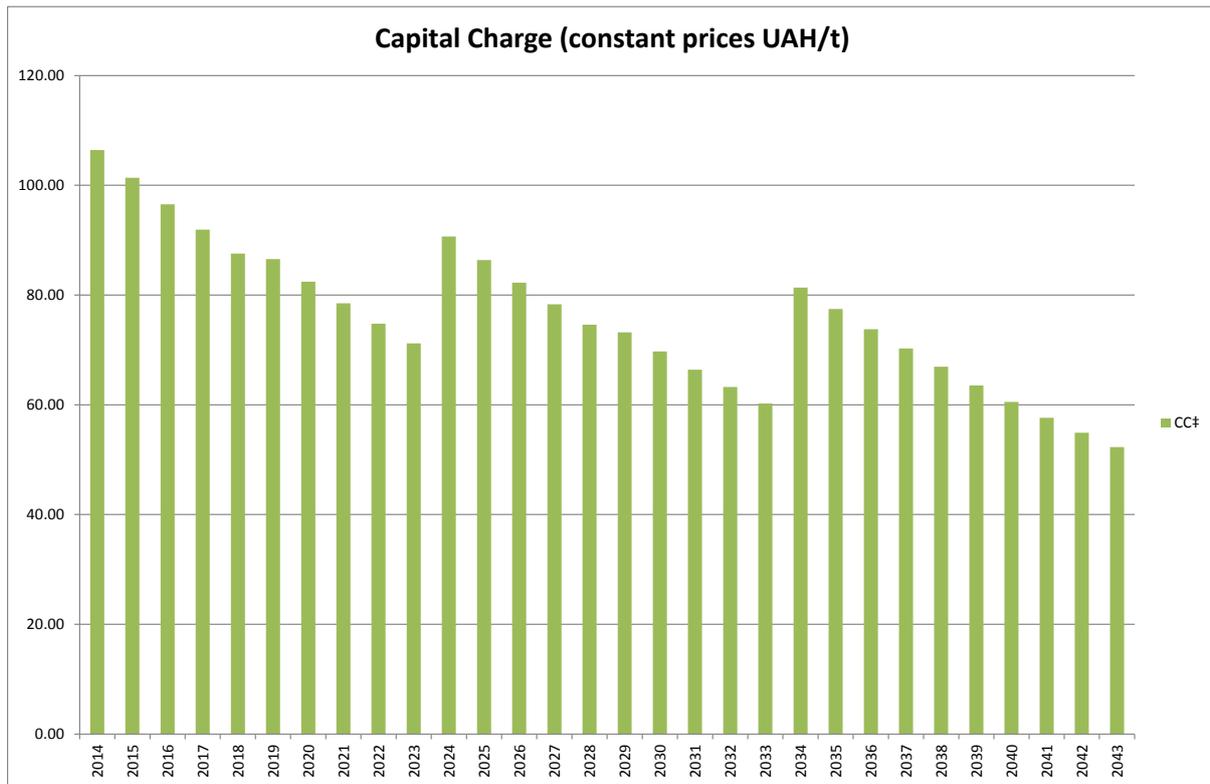
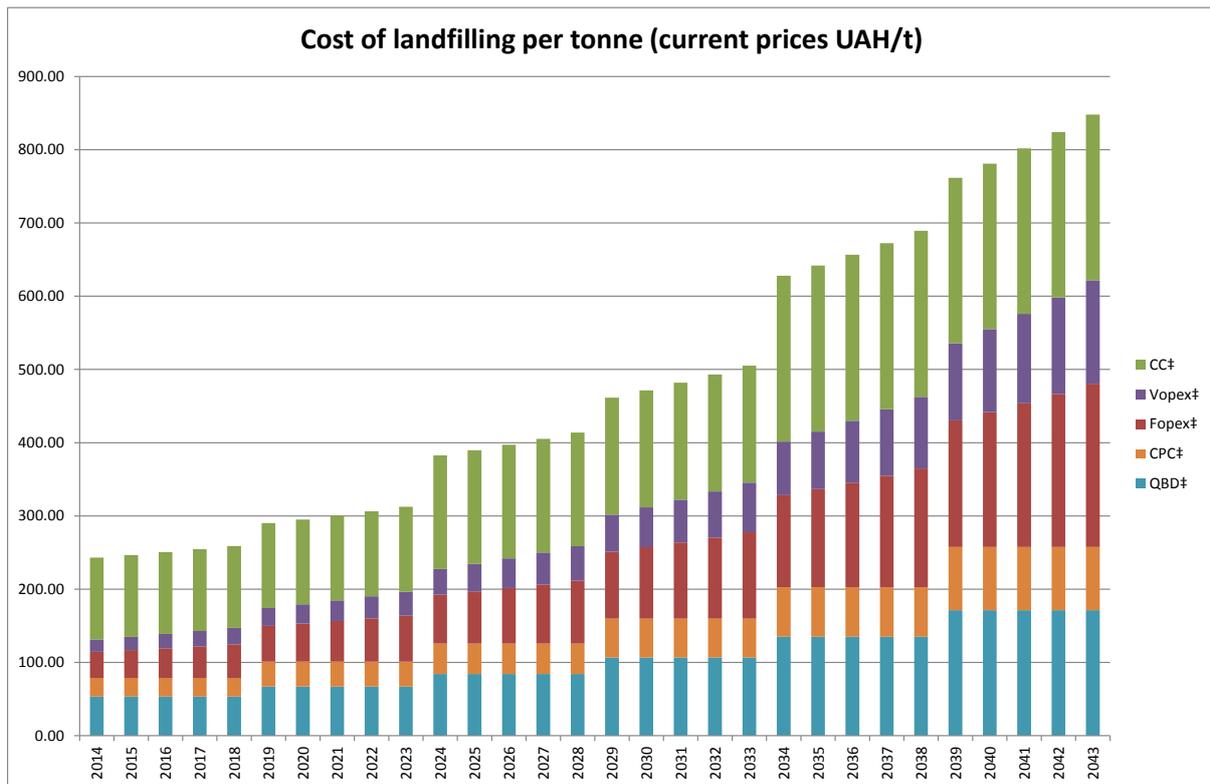


Figure 5. Gate fee under final methodology submitted (current prices)



Conclusion

The new methodology represents a step forward – and an increasing convergence with international standards – by improving transparency and predictability and by giving further assurances that capital investments will be remunerated appropriately. The latter aspect is especially important to encourage private sector investment in the MSW sector.

The methodology has not completely solved all the issues involved in setting the gate fee. An important issue is the trade-off between affordability and financeability.

From an affordability perspective, a constant or gently rising real tariff profile would be desirable, particularly when starting from a relatively low current tariff base and if real household income is projected to rise. But this might jeopardize the ability of operators to raise financing. Whereas it may be feasible in a developed market economy, such as in many EU countries, to smooth investment costs over the 30-year life of a landfill, this is an unlikely scenario in Ukraine, where long-term financing (or short term financing that can easily and reliably be rolled over) is difficult if not impossible to find.

Despite this constraint, the Commission may wish to carry out further analyses to examine different ways to balance the need for affordable prices and adequate financing, especially if this is done within the context of the development of the government's wider SWM policy and implementation program.