



26th Voorburg Group Meeting on Services Statistics

Newport, UK
September 19-23, 2011

SPPI Mini Presentation

SPPI on waste collection; waste treatment and disposal in France

ISIC 4.0 / 942, 943
NACE rev2 / 38.1, 38.2

Denis Gac (denis.gac@insee.fr)
Institut National de la Statistique et des Études Économiques (France)

1. The previous French classification of economic activities (NAF¹ Rev1) regarded “Waste collection” and “Waste treatment and disposal” as services. In the new classification (NAF Rev2), the two activities are classified instead as industrial activities (38.1 and 38.2 respectively), in section E, together with water capture, treatment, and distribution (36) and wastewater collection and treatment (37). Moreover, they were not included in the 2005 “Inventory of Voorburg Group PPI Activity,” which listed the business services to be examined by the Group. Yet they have been placed on the agenda of the 2011 Voorburg Group. There are, no doubt, two reasons for this: first, the ever closer interconnection between industry and services; second, the measurement of the output and characteristics of these sectors is becoming ever more relevant in economies where environmental issues are moving to center stage.

2. According to the French Commission for Environmental Accounts and Economics (Commission des Comptes et de l'Économie de l'Environnement: CCEE), environmental protection expenditure rose 4.1% to €44 billion in 2008. These outlays represented 2.25% of GDP, up from just over 2% in 2000.

Total environmental protection expenditure is defined as the sum of resources that resident economic units (government, businesses, and households) devote to environmental protection. The aggregate essentially consists of the “current” expenditure on the consumption of certain goods and services—such as water distribution, sewage treatment, and waste management—as well as capital spending.

“Environmental protection expenditure” measures the outlays by economic agents to prevent, reduce, or eliminate damage to the environment. It includes the following:

- wastewater management
- waste collection and treatment (including radioactive waste)
- street-cleaning
- protection of biodiversity and landscapes: management of protected spaces, conservation of species
- prevention of air pollution, including purchases of goods and services involving less polluting practices (such as “clean” fuels)
- noise abatement (such as soundproofing of dwellings)
- environmental research and development.

In France, the **largest expenditure item** for environmental protection in nominal terms is waste management, totaling €14 billion in 2008. The aggregate includes municipal and industrial waste management, and street-cleaning.

¹ Nomenclature des Activités Française.

Waste-management expenditure in France is financed as follows (€ million, current):

	2000	2001	2002	2003	2004	2005	2006	2007	2008
Government	1,917	1,967	2,153	2,033	2,271	2,550	2,642	2,482	2,500
Businesses	5,256	5,471	5,845	5,963	5,894	6,378	6,999	7,390	7,025
Households	2,732	2,901	3,139	3,403	3,520	3,875	4,116	4,323	4,512
Total	9,905	10,339	11,137	11,400	11,685	12,803	13,757	14,195	14,037

The attempt to measure this aggregate in nominal terms soon comes up against a major difficulty: how do we determine the volume/price breakdown? Over the past 13 years, national accountants have observed steep rises in prices paid by households per cubic meter of treated wastewater (+170%) and for waste collection (+150% for taxes paid per household). In the same period, however, the volume of waste per inhabitant (to take one example) has increased by only 12%. The latest available figures even suggest that the annual volume of household waste in France has started to decline.

While volume measures are available from official statistics (total volume of waste collected, by type, etc.), our knowledge of prices is imperfect, and the measurement of the efforts to improve the treatment of these categories of pollution and reduce their environmental impact is sketchy.

The calculation of the volume/price breakdown using volume and service-price indicators has proved to be long, painstaking, and imprecise. That is why the French Commission for Environmental Accounts and Economics (CCEE) asked INSEE in 2008 to calculate price indices in these activities. The ultimate aim is to obtain price indicators that will allow an acceptable volume/price breakdown—initially for the “market” production by waste-collection and waste-treatment firms.

1. Definition of the service being priced

Central government is an important agent in this sector, particularly for the regulatory aspects, but local authorities are also key players, as they are in charge of household-waste collection and treatment. They collect the taxes paid by households (household-waste collection tax [*taxes d’enlèvement des ordures ménagères*: TEOM]) and businesses (packaging tax: EcoEmballages). These revenues enable local authorities to finance the entire household-waste collection and treatment system. In computing the service-price index, INSEE has focused solely on services provided by private operators, excluding services rendered by non-market agents—namely, local communities, often via associations of municipalities.

Let us begin with some definitions regarding waste. Waste is not an ordinary good, i.e., the output of a classic production process. The French Environmental Code (art. L541-1) defines **waste** as “*any residue of a production process, processing operation, or utilization process; any substance, material, product, or, more generally, any movable good that has been discarded or that its possessor **intends to discard.***” Under this

definition, any discarded item constitutes waste. Yet this does not mean that the item is unusable, in its present state or after alteration. Only “final waste” is truly unusable and must be stored to avoid environmental pollution.

“An item of waste, whether or not obtained from the treatment of [another] item of waste, is regarded as **final** if can no longer be treated in current technical and economic conditions, notably by extracting its useful content or reducing its polluting or hazardous nature.” (Environmental Code)

The list of activities pertaining to waste collection and treatment is fairly simple:

38.11 Collection of non-hazardous waste

38.12 Collection of hazardous waste

38.21 Treatment and disposal of non-hazardous waste

38.22 Treatment and disposal of hazardous waste

By contrast, the list of the corresponding products and services in the European Union’s Classification of Products by Activity (CPA) is more detailed and complex, for it includes not only waste-management services (collection, transfer, treatment, disposal) but the waste itself, which, by definition, has no value since it destined for disposal. The waste “produced” in this manner is viewed as a by-product of the treatment performed (in particular, sorting) and as an input constituting the intermediate consumption of recycling activities (plastics, cullet [38.11.5]) or of activities more specialized in the disposal or long-term storage of highly hazardous materials (such as nuclear waste [38.12.21], which, as waste, can still be incorporated into “productive” processes in the longer run).

Depending on the classification, these waste products comprise services (the largest proportion) and goods (generally with a view to future recycling). The waste products to be recycled include by-products of sorting activity, such as paper and cardboard, cullet, and scrap metal.

CPA 2008:

- 38.11 Non-hazardous waste; collection services of non-hazardous waste
 - 38.11.1 Collection services of non-hazardous recyclable waste
 - 38.11.2 Collection services of non-hazardous non-recyclable waste
 - 38.11.3 Non-recyclable non-hazardous waste, collected
 - 38.11.4 Wrecks, for dismantling
 - 38.11.5 Other recyclable non-hazardous waste, collected
 - 38.11.6 Services of transfer facilities for non-hazardous waste
- 38.12 Hazardous waste; collection services of hazardous waste
 - 38.12.1 Collection services of hazardous waste
 - 38.12.2 Hazardous waste, collected
 - 38.12.3 Services of transfer facilities for hazardous waste
- 38.21 Treatment and disposal services of non-hazardous waste
 - 38.21.1 Non-hazardous waste treatment for final disposal services
 - 38.21.2 Non-hazardous waste disposal services
 - 38.21.3 Waste organic solvents
 - 38.21.4 Ashes and residues from waste incineration

38.22 Treatment and disposal services of hazardous waste

38.22.1 Nuclear and other hazardous waste treatment services

38.22.2 Nuclear and other hazardous waste disposal services

2. Pricing unit of measure

Enterprises in these sectors have different kinds of relations with their customers and different billing methods. We need to consider two types of price measures:

(1) Collection of household waste (or equivalent) is handled by local authorities. They can perform collection operations directly or outsource them to specialized firms. In the latter case, local communities and specialized firms sign multi-year contracts, typically for 4-5 years. The price that should be tracked here is obviously the price of the total contract, which is negotiated by the two parties. Collection contracts involve a large set of technical specifications and may very well be amended over time. The parties may sign riders that change the scope of the agreement. As in other activities where such arrangements are the rule—such as cleaning and security—price monitoring should be adjusted to the contract characteristics.

Contracts for household-waste collection obviously take all household waste into account. The tonnage collected is not the decisive price-setting variable, although it is a marginal adjustment variable (like population size) that allows year-to-year changes in the total contract value.

Contracts based on a per-ton price are possible but seldom used. They include tonnage ranges or a minimum guaranteed tonnage.

(2) The collection and treatment of industrial waste (as against household waste and equivalents) are simpler to track, since agreements are more *ad hoc* and the services sold are quantifiable—on the basis, for example, of quantity, volume, type of waste (plastic, chemicals, metals, and so on), or process (for treatment, storage or disposal). In this type of contract, it is easier to choose tonnage, volume, or any gauge of the quantity of waste handled as a suitable measurement unit. This is true for the collection of industrial waste but also for its transportation, treatment or disposal.

3. Market conditions and constraints

3.a. Industry size

3.a.1. Quantities of waste involved: when we talk about waste, what waste do we mean, and in what quantities?

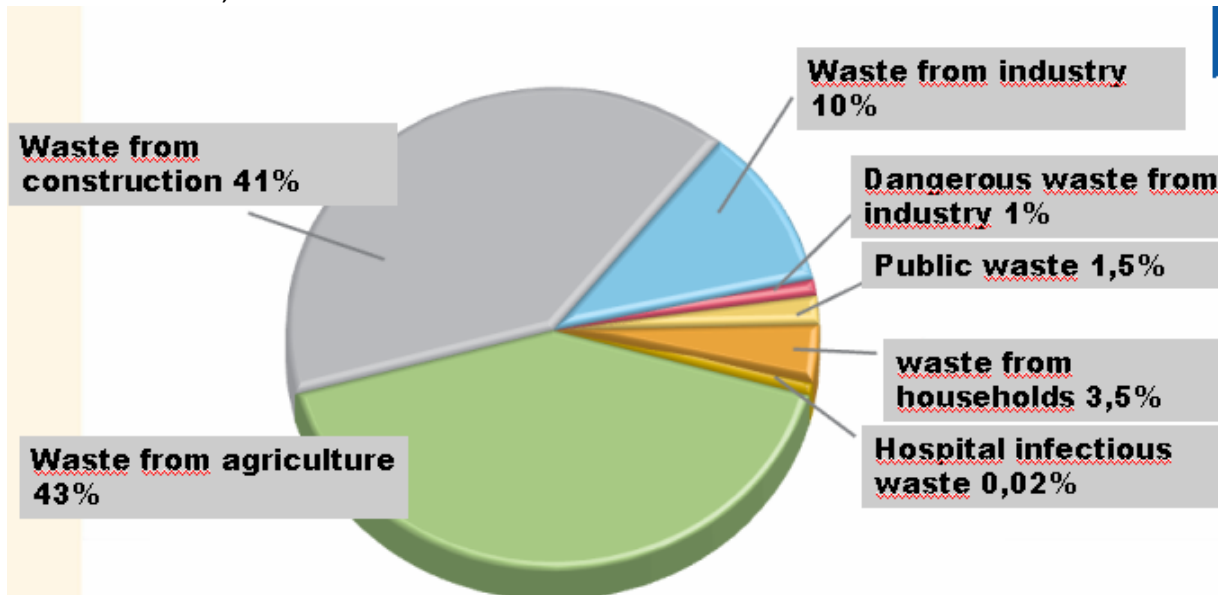
Waste production in France in 2006: 868 million metric tons

Public waste	Household waste (HW)		Industrial waste (excluding agriculture and construction)		Agriculture and forestry waste	Healthcare waste	Construction waste
14	31		90		374	0,2	359
Roadways Markets Sludge Green waste	Bulky waste and green waste	Household waste (in narrow sense)	Non-hazardous waste	Hazardous waste	Livestock breeding Crops Forests		Building Public works Non-hazardous waste
	11	20	84	6	of which non-organic waste	356	
			of which collected with HW	of which collected privately	1,2		Hazardous waste
			5	79			3
Municipal waste					(million metric tons)		
Household waste and equivalents							

Sources: ADEME, SOeS (ex-IFEN) – Data from surveys, studies, and estimates produced between 1995 and 2007

Quantity of waste produced in France, 2006

Sources: ADEME, IFEN

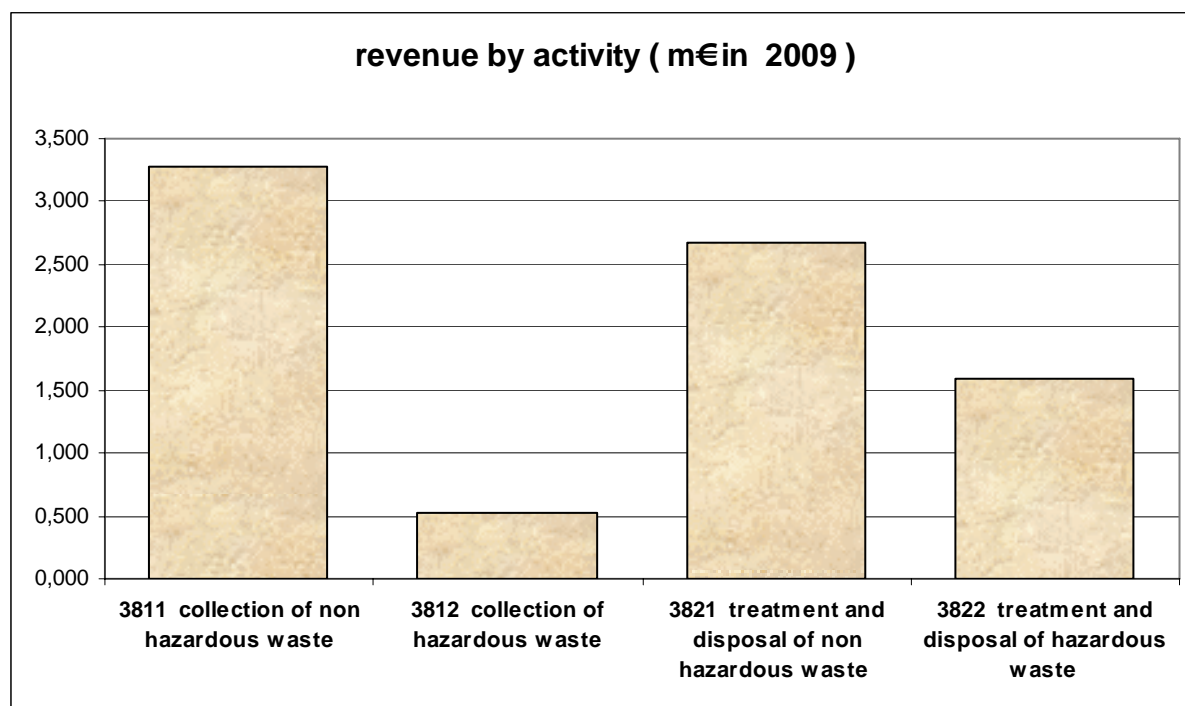


In fact, almost all of the nearly 374 million metric tons of waste from agriculture is treated on site (manure buried or spread in fields, burnt straw, and so on) and does not represent a market for firms. The situation is practically identical for waste from construction (cement, concrete, timber, and earth), often re-used on site or nearby (embankments). Its treatment frequently consists in a single operation to dispose of it in appropriate landfills using the construction firm’s own machinery.

The categories of genuine interest to us are therefore municipal waste (household waste and equivalents, plus public waste) and industrial and hospital waste, which still add up to 135 million metric tons.

3.a.2. Municipal waste is not managed solely by **specialized firms**. While local authorities are in charge of municipal-waste collection and treatment, they do not always have the resources to organize the collection, the purchase of garbage trucks,

the hiring of trash collectors, and so on. As a result, these tasks are outsourced through a bidding process to private-sector firms that take on the entire operation. **Two-thirds of municipal waste management in France is handled by the private sector** for a total €4.1 billion.² The firms involved in waste collection, treatment, and disposal are highly concentrated. Two industrial groups (GDF-Suez and Veolia) control the largest market share in France. These conglomerates were mostly formed through external growth by acquisition of local operators. Between them, they account for some 55% of total sales in the sector. Industrial-waste management is generally handled by highly specialized companies.



Source: ESANE 2009-structural survey

Competition is stiff in waste collection, a market that functions on a procurement basis. New “cut-rate” players emerge, often from the transportation sector.

Sector	Number of firms, 2008	Workforce in full-time equivalent terms, 2008 (number)	Number of employees, Dec. 31, 2008	Sales (net of VAT), 2008 (€ millions)	Value added, 2008 (€ millions)	Labor expenses, 2008 (€ millions)
38 1 Waste collection	743	33,255	35,863	4,276	1,951	1,474
38 2 Waste treatment and disposal	640	21,897	23,813	5,791	2,296	1,095
38 3 Recycling	4,803	22,323	25,164	11,603	2,050	1172

Source: ESANE 2008, Sector production

² *Rapport de la Commission des Comptes et de l'Économie de l'Environnement (CCEE), 2010 ed.*

3.b. Special conditions and restrictions

Government is a major player in the sector: Waste is an issue that concerns the environment, health, and conservation of raw-material resources. It is therefore closely monitored by the authorities. The EU adopted a Directive (November 19, 2008) to protect the environment and human health by preventing the harmful effects of waste production and management. All Member States were required to incorporate the Directive into their legislation by end-2010.

The Directive describes the major stages of waste management, ranking them by priority: prevention, re-use, recycling, recovery (particularly for energy purposes), and, lastly, disposal. It describes the now broader responsibilities of waste producers and owners, with waste-management costs now carried by waste producers.

The market is therefore subject to restrictive legislation that applies not only to collection and treatment processes but also to quality standards for residues such as fumes and leachates. The legislation is designed to address health problems (such as the effects of incinerator emissions) and environmental impacts (such as management of leachates in landfills, and reduction of greenhouse-gas emissions from landfills). These requirements inevitably add to costs throughout the waste-management chain.

Waste-mass reduction and waste-recycling objectives are spurring the introduction of ever more numerous and complex systems for sorting and recovering products such as used tires, batteries, oils, and electrical and electronic appliances. By generating these processes, government intervention thus ultimately impacts the value of the collection service.

From the above, we can conclude that the quality of service provided is a key factor to consider when measuring the sector's production volume. And this quality of service provided is a consequence not of the household's voluntary choice, but of decisions concerning the environmental public interest, which transcends personal interest.

The operator's legal status affects the costs carried by the operator, and hence the prices charged. The operator may be either (1) a public-service concessionaire, managing investments (in facilities) that may be made by local authorities, or (2) a "conventional" private-sector provider, fully responsible for its facilities and investments.

The sector requires major facilities such as household-waste incineration plants and, in a related activity, wastewater treatment plants. These investments may be made by local authorities and managed either by the authorities themselves or by private-sector operators under service concession contracts of varying complexity.

Alternatively, the facilities may be built by private-sector operators under "public-service concession" agreements. In such cases, the facilities belong to the operator for a duration specified in the contract. The operator acts as a public authority in the domain specified in the contract. If the consortium of municipalities (*communauté de communes*) is in charge of making the investments needed to bring the incineration plant up to current standards, the impact on the price charged by the operator will be



smaller than if the investment is made directly by the operator. The evidence shows, however, that even when the investment in the incinerator is made by the local authority, the operator will nevertheless pass on price increases to users owing to higher management costs.

Note: one could take the view that if the service provider's income is not determined by the selling price of the service, the price of the service provided depends not on the cost of waste treatment but on the price stipulated in the overall contract for the "basic" infrastructure management service.

In sum, financing for waste-management projects is provided both by market-sector entities (private-sector operators) and by non-market entities (through investment in infrastructure or via work performed directly by municipal employees). These connections should be taken into account when measuring the price of the total service. In France, the first choice of approach for measuring market-service prices was based on the assumption that their variations matched those of non-market services.



3.c. Record-keeping practices

The growth of enterprises working in this sector has often been driven by demand from local communities. Many of them began as local transportation companies that branched out into waste collection. In waste treatment as well, many firms were previously involved in waste transportation or recovery.

The two French conglomerates currently operating in the sector have expanded via external growth by successively acquiring local firms.

The markets, however, have remained very local. Calls for bids typically concern a single town or a grouping of municipalities. For waste treatment, storage facilities are often managed locally. While the parent companies track their subsidiaries' financial performance and centralize strategic information, they do not possess the quantitative indicators that would be useful for the kind of price monitoring of interest to us.

Often, therefore, we have trouble achieving consistency between the information collected from local operating units and the financial information held by the national entities or regional offices of enterprise groups, which may be responsible for managing several distinct legal units in their geographical sphere.

4. Standard classification structure and detail related to the area

(does the standard include necessary product detail based on identified price-determining characteristics?)

INSEE has calculated price indices for 38.1 and 38.2, setting aside 38.3 (Materials recovery services; secondary raw materials) for the time being. The activities of 38.1 and 38.2 are performed fairly often by the same firms.

While the four-digit classification is perfectly understood by professionals (distinction between hazardous and non-hazardous), the fifth digit is less relevant to their concerns.

For **waste collection**, the price-determining characteristics are as follows:

Household waste or industrial waste: Household waste is generally regarded as non-hazardous; industrial waste is generally regarded as hazardous.

HW Type of collection

- collection in standard rounds with truck + one or more trash collectors (the current trend is to use a “truck + single collector” combination, or a truck fitted with an articulated arm that empties the containers without requiring a collector)
- collection of sorted waste
- collection of residual portion (excluding sorted waste)
- collection of glass, cartons, used clothing, etc. from voluntary drop-off points
- collection of bulky waste (“monsters”)
- collection of waste from dumps
- collection of packaging and street-market waste

HW Collection area

- dense urban area (limited collection speed, heavy traffic, narrow streets, fines for traffic violations: *e.g. Paris*)
- peri-urban area, single-family homes (lower population density)
- rural area, diffuse (scattered dwellings, long rounds, longer spells between collections)

HW Collection frequency

- varies from a single collection per week to continuous collection in some wealthy Parisian suburbs)
- collection days may be officially mandated (weekends or weekdays)
- collection hours may be mandated as well (e.g. very early in the morning, before start of deliveries in shopping districts)

HW Types of containers

- standardized containers (bins)
- bags rather than containers
- are containers grouped together in collection points?
- do containers need to be put back “with the handle facing the resident”?

HW Requirements for collection vehicles

Characteristics: diesel, natural gas, noise level. Local communities may demand certain types of vehicles depending on their environmental requirements. The obligation to use natural gas necessitates a gas-compression facility, which represents a heavy investment.

HW Discharge location

Discharge or storage locations may be specified in the contract. Distance from the storage facility is a price-determining characteristic.

For **waste treatment**, the price-determining characteristics are as follows:

Container: drum, bin, shrink-wrapped pallet, bulk

Hazard level: HW or chemical product, radioactive material, explosive, etc.

Quantity: grams, metric tons, or other unit

Consistency: liquid, paste, solid

Distance from treatment facilities: some types of highly specialized centers are rare, and some waste may have to be shipped all the way across France

Type of landfill site suited to the waste treated

class 1 for toxic waste

class 2 for household waste and equivalents

class 3 for inert waste

Capture rate for sorting centers

Capture rates in sorting centers are specified by contract.

For example, a 70% capture rate applied to sorted newspapers means that, for 100 kg of sorted waste containing 40 kg of newspapers, 28 kg must be recovered (otherwise, penalties will apply).

5. Evaluation of standard vs. definition and market conditions

CPA 2008 Division 38 includes enterprises with highly complementary activities. Often, the units are actually involved in several of the industries forming the Division. All the stages of the waste-management process are included. By logic, this would be an argument for calculating indices for all Division activities in parallel, i.e., including the recycling of materials.

It may be objected, however, that these recycling specialists are absent from the waste-collection process—whereas waste-treatment firms derive part of their revenues from recovering recyclable raw materials. This is particularly true of household-waste incineration plants, an aspect that can significantly influence the price of incineration services.

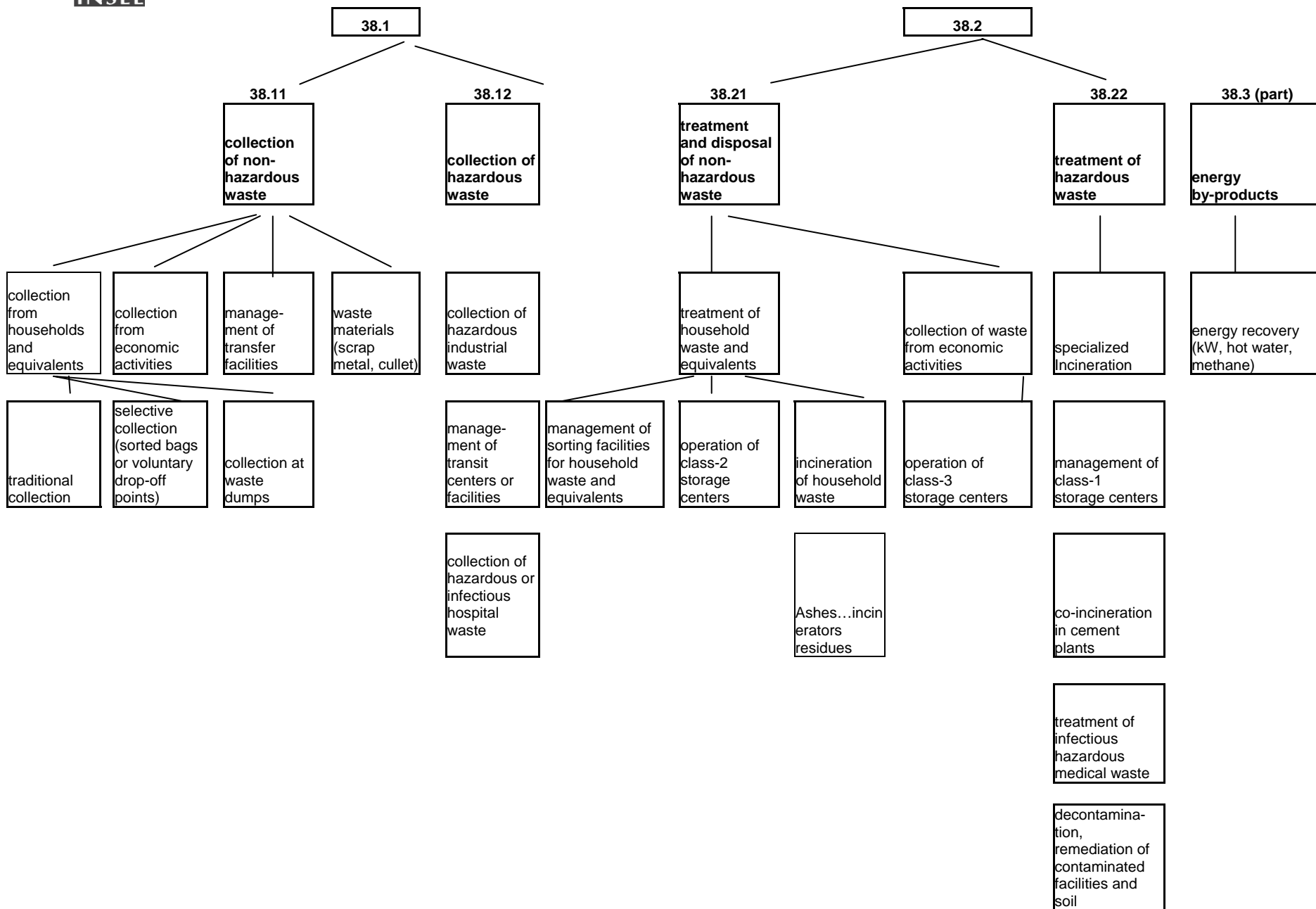
If the incineration or waste-treatment activity generates a by-product involving energy recovery (hot-water production) or biological recovery (compost production), this can have a measurable effect on the selling price of waste-treatment services.

The production of recyclable products (including compost 38.21) falls within the scope of the index. Energy recovery—including production of electricity, steam, hot water, and methane—does not.

We have sampled firms in the four NAF Rev2 classes 38.11, 38.12, 38.21, and 38.22, from the files used by national accountants to calculate production.

The detailed classifications used for segmenting production are based on preliminary contacts with trade organizations and executives of the two or three main enterprise groups operating in France. This breakdown derives from the official classification but also relies on the stages or processes well identified by industry representatives (we borrow their terminology) and existing regulations (for example, the distinction between the three classes of landfills).

We use the following aggregation tree:



6. National-accounting concepts and measurement issues relevant to GDP measurement

- 1 In the new national-accounts base under NAF Rev2, national accountants work at the two-digit level (38), which therefore also includes category 38.3 (recovery).

More than 50% of production at this level includes activities classified as services in NAF Rev1: waste collection, treatment, and disposal. Around 40% consists of recovery activities already classified under industry in NAF Rev1.

NAF Rev1 did not identify secondary raw materials as such. They were recorded as a transfer of production between recovery and the corresponding industries (glass, paper, plastics, metal, and so on).

- 2 National accountants begin by calculating the production of a sector, reconciling it with the tax returns filed by firms in the sector.

NAF Rev2		Share of output (%) ³
38.1	Collection of waste	29
38.11Z	Collection of non-hazardous waste	25
38.12Z	Collection of hazardous waste	4
38.2	Treatment and disposal of waste	31
38.21Z	Treatment and disposal of non-hazardous waste	20
38.22Z	Treatment and disposal of hazardous waste	11
38.3	Recovery	40
38.31Z	Dismantling of wrecks	3
38.32Z	Recovery of sorted waste	37

Source: National Accounts

However, because of the economic organization of enterprises classified in these activities, we have decided to analyze two groups of activities separately: (1) waste collection and treatment (38.1 and 38.2); (2) recovery (38.3). The reason is that the Annual Sectoral Surveys (Enquêtes Annuelles Sectorielles: ESANE) show that, while waste-collection firms also engage in waste treatment, waste-recovery firms are not involved in either of those activities.

- 3 Volume/price breakdown: For 38.1 and 38.2, we use the services producer price indices (SPPIs) calculated by INSEE. For 38.3, national accountants use data from FEDEREC, the French recycling and recovery industry association. For 38.3, volumes are calculated from detailed FEDEREC data.

³ Annual Production Survey (Enquête Annuelle de Production: EAP), 2009.

7. Pricing methods and criteria for choosing various methods

It is important to separate collection activities from treatment and disposal activities.

7.a. For HW collection, an essential point: the service provided by firms cannot be segmented. Waste collection effectively consists in picking up **all** waste that residents leave out in front of their homes, and not just a single part of that waste. Consequently, tracking the price per metric ton is not a feasible solution, despite its very frequent use as an indicator by private-sector operators and by stakeholders who note that household-waste volume is leveling off or declining slightly even as the collection bill is rising.

In France, households pay not according to what they put out for collection, but according to the “cadastral rental value” of their dwellings, which also serves to assess other local taxes. Some local communities are attempting to introduce “pay-as-you-throw” (“PAYT”) as an incentive to increase recycling and curb waste generation, since the price to pay is no longer a flat rate, identical whatever the quantity of waste left to collect.

With “PAYT”, we can determine a unit price for households involved. “PAYT” is theoretically suitable for calculating a consumer price index (CPI), i.e., what the household pays to its local community for the service (although the index would not take into account the quality effect due to the introduction of different collection procedures for recyclable and non-recyclable waste). In practice, however, “PAYT” is inappropriate for calculating a PPI, since the operator does not bill on that basis.

Some French municipalities have introduced a fee system similar to PAYT called *à la levée* (literally, “per pick-up”), as an incentive to reduce the amount of waste collected. It involves a microchip on the bin, a lock, and a charge for each time the bin is emptied.

7.b. The most effective method for measuring the service price appears to be **to monitor the contracts** signed between private-sector operators and local communities. However, we need to determine whether the contracts are identical over time, with the same collection area and the same frequencies. Collection areas often widen because of the inclusion of new neighborhoods in the collection route. One way around this problem is to measure the price of **the collection hour** for a given arrangement, typically, one truck and two collectors. When the contracts are drawn up, their amounts may be pegged partly to population size and partly to cost indices, typically for fuel oil and gross wages.

The price per resident is a good way to address short-term fluctuations in unit prices, if the characteristics other than the collection area have not changed radically.

Recycling incentives often lead to **changes in the collection process**. The process now comprises not only (1) the collection of unsorted waste, but also (2) the collection of bins at voluntary drop-off points (*PAV: Points d'Apport Volontaire*) for glass, paper/cardboard, and plastics, and (3) pick-ups of sorted waste (yellow bag for paper, blue bag for green waste). The increase in the number of waste dumps—where households go to deposit their sorted waste themselves—also reflects a more advanced collection method. Access to the dumps is not billed directly, but included in the “household-waste collection tax” (*TEOM*) that households pay annually.

Accordingly, the pick-up of a bin at a voluntary drop-off points, an hour of maintenance at a waste dump (with a distinction between operations in the “upper loading area” [i.e., at the reception end] and “lower loading area” [i.e., at the removal end]), and an hour of waste collection are acceptable units for measuring these new services.

As collection is an increasingly segmented service, the prices to be observed must also reflect this ever greater market segmentation. The average price per metric ton for all materials combined no longer suffices.

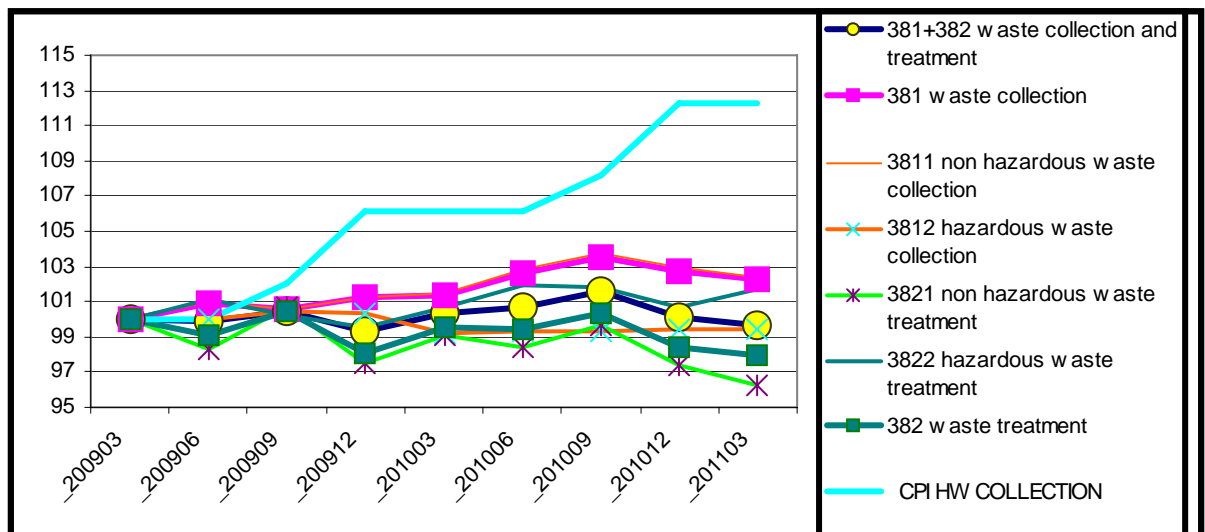
7.c. For waste treatment and disposal, the most appropriate solution seems to be price per quantity. Characteristics that should be taken into account include:

- type of product (solvent, grease, paint, radioactive material, nano-material, etc.)
- format (liquid, unsorted/bulk, etc.)
- quantity (50 g, 10 metric tons)
- process to be implemented (storage, landfill, incineration, etc.).

We need to be as consistent as possible with the process that will be implemented. Unit prices at company level are not a good solution.

For household-waste incineration plants, prices per metric ton of “input” are an acceptable solution.

SPPI in France from Q1 2009 to Q1 2011



8. Quality-adjustment methodology

The improvement in the quality of service provided may call for a quality adjustment. Overall quality in waste collection and treatment is not determined solely by the buyer and seller, for this activity sector also concerns health, pollution, and the environment. In keeping with EU Directives, the authorities are involved in regulation, setting pollutant emission standards, defining the procedures to be implemented, and setting guidelines for local policies. In France, for example, the multi-party conference known as “Le Grenelle de l’Environnement” set the following targets:

- reduce household-waste production by 7% per year
- increase recycling of materials and organic substances in order to raise the share of recycled household waste and equivalents from 24 % in 2004 to 35% in 2012 and 45% in 2015
- reduce incineration volume by 15% between 2009 and 2012.

Regarding incinerator fumes, for example, the standards are complex and hard to summarize, assuming the data are available. Moreover, in some cases, the reduction in pollutant emissions due to a change in incineration-plant filters may not have been achieved by the private-sector operator, which simply manages the facility. The adjustment of waste-incineration prices according to the chemical composition of the fumes is a subject still to be explored.

Aside from technical improvements, the detailed analysis of **collection processes** must be conducted with maximum attention to contracts and geographic areas. The current trend is to separate waste-collection flows, thereby increasing total collection activity. If we track unit prices at too broad a level, we cannot meet that requirement for precision. In some localities, for example, a twice-weekly collection of unsorted waste may be changed to a single collection of unsorted waste and one collection of sorted waste.

Do **productivity gains** affect price measurement? Collection equipment is becoming ever more productive. Trucks can now pick up unsorted and sorted waste at the same time, avoiding a double collection. Vehicles formerly operated by two persons are now operated by a single one, as an articulated arm is now capable of handling the bins. Monitoring the collection hour should be confined to a specific type of collection. The local community pays for waste removal, not for a particular collection arrangement. If the collection hour is an adequate proxy for the service price, then the productivity gains will accrue to the operator.

9. Evaluation of comparability with turnover/output measures

Supply-and-use table, 2010 figures (€m, provisional)

DIVISION "38" PRODUCTION, BASIC PRICES	15,700
Market production of non-market industries	5,500
PRODUCT PRODUCTION, BASIC PRICES	21,200
Total imports	1,300
TOTAL SUPPLY	22,500
TOTAL INTERMEDIATE CONSUMPTION (IC)	16,000
TOTAL FINAL CONSUMPTION (FC)	3,800
TOTAL EXPORTS	2,700
TOTAL USE	22,500

Source: INSEE, 2010 national accounts

France compiles supply-and-use tables at Division level, i.e., level 38 of the NAF Rev2 classification.

Industry (*branche*) 38.3 (Materials recovery services; secondary raw materials) accounts for half of the production of Division 38.

A/ The measurement of production of Division 38 therefore depends heavily on how well we can measure the production of Industry 38.3. However, the latter is generated both by services (recovery and recycling) and by the production of goods (copper, nickel, paper, cardboard, glass, etc.). The value of these goods, in turn, is strongly determined by commodity prices, which—as we have seen in recent years—are extremely volatile.

B/ Part of the production of Division 38 (26%, according to national accountants) is generated by non-market industries, i.e., waste collection performed by municipal employees in public-sector entities. The measurement of this activity is fundamentally different from the measurement of market activity. The assumption made in France is that market-sector price indicators can also apply to non-market services in waste-related activities.

C/ Household consumption in the accounts of Division 38 exactly matches expenditures on household-waste collection and treatment. Until now, the price index was an indicator based on the cost per household of the "household-waste collection tax" (*TEOM taxe d'enlèvement des ordures ménagères*). The SPPI calculation will allow a more accurate adjustment of that index to the sub-indices for household-waste collection and treatment.



10. Summary

Since September 2010, INSEE has been publishing seven producer price indices (38.11, 38.12, 38.1, 38.21, 38.22, 38.2, and the sum 38.1+38.2) with 2010Q1 = base 100. These indices are calculated from surveys of 56 firms, involving observations of 600 provisions of services totaling €4.8 billion in sales. This represents some 50% of sector activity measured in France.

These indices are already used by national accountants to deflate the share of production generated by waste collection and treatment. The calculation of price indices concerning household waste alone will serve to better deflate household consumption.

Annex 1 / CPA 2008 classification

38.1 Waste collection This group includes the **collection of waste from households and businesses** by means of refuse bins, wheeled bins, containers, etc. It includes collection of non-hazardous and hazardous waste e.g. waste from households, used batteries, used cooking oils and fats, waste oil from ships and used oil from garages, as well as construction and demolition waste.

38.11 Collection of non-hazardous waste

This class includes:

- collection of non-hazardous solid waste (i.e. garbage) within a local area, such as collection of waste from households and businesses by means of refuse bins, wheeled bins, containers etc may include mixed recoverable materials
- collection of recyclable materials
- collection of refuse in litter-bins in public places

38.12 Collection of hazardous waste

This class includes the collection of solid and non-solid hazardous waste, i.e. explosive, oxidizing, flammable, toxic, irritant, carcinogenic, corrosive, infectious and other substances and preparations harmful for human health and environment. It may also entail identification, treatment, packaging and labeling of waste for the purposes of transport.

This class includes:

- collection of hazardous waste, such as:
 - used oil from shipment or garages
 - bio-hazardous waste
 - nuclear waste
 - used batteries etc.
- operation of waste transfer stations for hazardous waste

38.2 Waste treatment and disposal This group includes the disposal and treatment prior to disposal of various forms of waste by different means, such as treatment of organic waste with the aim of disposal; treatment and disposal of toxic live or dead animals and other contaminated waste; treatment and disposal of transition radioactive waste from hospitals, etc.; dumping of refuse on land or in water; burial or ploughing-under of refuse; disposal of used goods such as refrigerators to eliminate harmful waste; disposal of waste by incineration or combustion. Included is also energy recovery resulting from waste incineration process.

38.21 Treatment and disposal of non-hazardous waste This class includes the disposal and treatment prior to disposal of solid or non-solid non-hazardous waste:

- operation of landfills for the disposal of non-hazardous waste
- disposal of non-hazardous waste by combustion or incineration or other methods, with or without the resulting production of electricity or steam, compost, substitute fuels, biogas, ashes or other by-products for further use etc.
- treatment of organic waste for disposal

Treatment and disposal of hazardous waste This class includes the disposal and treatment prior to disposal of solid or non-solid hazardous waste, including waste that if explosive, oxidising, flammable, toxic, irritant, carcinogenic, corrosive, infectious and other substances and preparations harmful for human health and environment.

This class includes:

- operation of facilities for treatment of hazardous waste
- treatment and disposal of toxic live or dead animals and other contaminated waste
- incineration of hazardous waste
- disposal of used goods such as refrigerators to eliminate harmful waste



- treatment, disposal and storage of radioactive nuclear waste including:
 - treatment and disposal of transition radioactive waste, i.e. decaying within the period of transport, from hospitals
 - encapsulation, preparation and other treatment of nuclear waste for storage

Annex 2

Source: French Mayors' Association (Association des Maires de France: AMF)

A RANGE OF MANAGEMENT METHODS

1 The term **direct management** is used when the public authority manages the service itself, notably with its own human and financial resources. Direct management of the public service by the municipality or the public agency for intermunicipal cooperation is known as a *régie*. There are three types of *régies*:

- basic or direct *régie*, an arrangement that municipalities can continue to use if it predates December 28, 1926
- *régie* vested with financial independence only
- *régie* recognized as a financially independent legal entity, in which case it is designated as a local public agency (*établissement public local*).

Under service contracts subject to the public-sector procurement code, *régies* sometimes outsource all or part of the service management to private-sector operators. Such tasks may include operating a wastewater treatment plant, inspecting networks, remote meter-reading, or billing.

Household-waste collection is often handled via direct *régie*.

2 **Indirect management:** service management may be outsourced to a third party in the public or private sector. This is known as *gestion déléguée* ("**delegated management**"). "Delegation of public service" (*délégation de service public*: DSP) is a management arrangement in which a community subcontracts the management of all or part of the public service for which it is responsible to a concessionaire, after a competitive bidding procedure. The community sets the service prices and the concessionaire is bound by contract to the community. The concessionaire's remuneration will depend on the operating income from the service, in compliance with the obligations and prices specified in the contract. The concessionaire may be asked to build facilities or acquire goods needed to provide the service. Concessions are always supervised by public authorities.

Household-waste incineration plants may be outsourced under the DSP procedure.

The most common form of outsourcing of public service is known as **affermage**, followed by **concession**. Another form of outsourcing is the "stakeholding *régie*" (***régie intéressée***), in which the operator, designated as "stakeholding *régisseur*" (***régisseur intéressé***), is paid by the community under a profit-sharing arrangement. Hybrid contract forms are also common, such as **affermage** contracts with concessionary provisions.