The inclusion of CO2 accounting in the IPSAS accounting standard

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Abstract
Accounting and reporting for the CO2 footprint has become standard procedure for capital market-oriented companies since the IFRS S2 standard was released in 2023. However, the IPSAS Board have already committed themselves to: (i) include CO2 Accounting in the standard; and (ii) to orient themselves towards IFRS S2. The contribution will show what this means for public sector entities in terms of facility and energy management, procurement of capital goods, materials and services as well as waste management. It will also show how the resulting requirements can be included in ERP systems that are already in place for public sector administration.

Keywords: CO2 Accounting, Sustainability, Public Sector Accounting, IPSAS.

1. Introduction
Effective measures against climate change have become a major topic in the public discussion. In 2023, the IFRS Board for the International Financial Reporting Standard published non-financial reporting standards S1 and S2 for sustainability in general and CO2 footprint reporting, respectively. [1] [2]. The European Union passed its own sustainability and CO2 Accounting standard [3] ESRS, which is similar, however, not quite identical to IFRS S1 and S2 (for a comparison, see [4]). IFRS is relevant for capital market-oriented companies, the corresponding standard in the public sector is IPSAS. [5] The IPSAS Board committed themselves to: (i) prioritize implementation of climate-related disclosures; and (ii) to follow IFRS S2 ([6], Sections 3.11 and 5.4). IFRS covers all types of GHG emissions, however they are to be converted into CO2 equivalents, which account for the bulk of GHG emissions; hence it does make sense to use the term “CO2 Accounting”.

The focus on climate-related disclosures is also indicated by IFRS S2, even without any commitment from the IPSAS Board side. IFRS S2 generally follows the GHG protocol [7] which organizes greenhouse gas (GHG) emissions in “Scopes” (for a detailed discussion, see the next section). Scope 3.15 covers financial institutions ([8], p. 136ff) and their emissions associated with its investments in the reporting year; it covers equity investment, loans of any kind and project finance. Financial institutions are to include climate-related risks in evaluating the overall risk involved in an investment – this includes the carbon

footprint. Banks and other financial institutions are typically stock-listed companies and are hence subject to IFRS in industrialized nations and also beyond. This explicitly includes public sector entities. [9]

Hence, by its very nature, public sector entities entering the capital market as borrowers would still need to comply with IFRS S2, if their lender was a stock-listed entity. It therefore makes sense to: (i) include such provisions in IPSAS; and (ii) to follow the guidelines set by IFRS S2. This ensures compatibility of what has to be reported under IPSAS guidelines and what is expected by the financial institution under IFRS.

In the following sections, the general framework for CO2 Accounting following IFRS will be described (Section 2), organizational choices and attributability (Section 3) and how it impacts data management in a municipality (Section 4).

2. The framework

2.1. Scopes 1 and 2

The emissions of an organization are organized in "scopes". Scope 1 determines the direct GHG emissions from stationary and mobile combustion (e.g., trucks). Scope 2 pertains to the consumption of electricity and similar energy services, such as distance cooling or heating. In this field, the similarities between private sector companies and public organisations are minimal. Scope 1 will be a main topic for all public sector organisations that have a fleet of vehicles, such as police forces, municipal services (road cleaning, garbage collection, etc.) and public transport. In many of these cases, the question of attributability is key, for more details, refer to Section 3.

Scope 2 will mainly focus on electricity and (where applicable) long-distance heating, which are very common to any public organization. Since a number of public sector entities, however, already chose zero emission suppliers, there will not be much change in this regard.

2.2. Scope 3 - overview

Scope 3 covers external emissions attributable to the organization as listed below:

- 3.1: Purchased goods and services
- 3.2: Capital goods
- 3.3: Fuel- and energy-related activities (not included in scope 1 or scope 2)
- 3.4: Upstream transportation and distribution
- 3.5: Waste generated in operations
- 3.6: Business travel
- 3.7: Employee commuting
- 3.8: Upstream leased assets
- 3.9: Downstream transportation and distribution
- 3.10: Processing of sold products
- 3.11: Use of sold products
- 3.12: End-of-life treatment of sold products
- 3.13: Downstream leased assets
- 3.14: Franchises

3.15: Investments

Scope 3 is hence by far the most complex scope. One can see immediately that the footprint is captured holistically and relies extensively on ERP data (Enterprise Resource Planning, for an introduction, see [10]).

2.3. Scope 3.1 - procurement

Let us start with Scope 3.1, purchased goods or services, as an example. For these parts or services, the company takes on the footprint sunk in the purchased items. This equally applies to the footprint of transportation as well (Scope 3.4). This means that the supplier must provide the corresponding data; this is precisely why IFRS S2 has an impact far beyond the original organization that is audited following IFRS. It covers the entire supply chain. These values provided by the consecutive chain of suppliers should also be auditable, it is to be expected that corresponding auditing rights of the auditor will be included in future supply contracts. This also goes for public sector entities.

Since public procurement typically will be based on tendering procedures, the footprint and other sustainability-related criteria need to be included in the tender documents to ensure compliance with public procurement laws. The footprint thereby becomes an awards criteria like price, quality parameters or durability. In this regard, regional procurement will also play a part as it determines the transportation footprint. Where applicable, the best way to ensure regionality, is to split the overall requirement into regional procurement lots thereby partially forgoing the price advantage of demand bundling. The benefit on the other hand is to ensure increased sustainability by using regional suppliers and to promote SMEs (for an example see [11]).

It also needs to be clarified how the CO2 footprint of the purchased part should be stored in the ERP system. The first step is the info record, which contains the supplier-specific information about the material, such as price, terms, delivery periods, etc [12]. Now the CO2 footprint reported by the supplier is added including the transport and logistics footprint according to Scope 3.4. If there are several suppliers (and thus info records) for a purchased part, a price comparison is already displayed in the source of supply determination in any typical ERP system. In addition, this will contain the additional CO2 information of the respective source of supply added-up for the procurement lot.

Presumably, there will now be an overall consideration of price and footprint. This procedure will apply to all cases, where there are multiple framework contracts that apply to a part, which would be a typical situation for “manufacturing-like” entities in a city administration, such as repair centers for public transport or municipal utility maintenance services.

The footprint information must be stored in the stock level (plant stock, storage location stock) and in the valued stock in the accounting view of the material master after the goods receipt. There are two ways to do that:

A lot can be created and the footprint can be managed per lot. Whenever a material is withdrawn, the footprint of the lot is applied. Alternatively, a weighted footprint can be formed analogous to a moving average price. In the case of very different footprints of the suppliers, the former method has the advantage that, for example, for exports to countries

without a CO2 regime, the presumably cheaper and more CO2-intensive part can be used, in countries with a CO2 regime the presumably more expensive, but less footprint-laden part can be used. Ideally, the ERP system offers the possibilities to store or use this data in info record, vendor assignment, price comparison, order and material. An add-on product must then be able to at least access this data in the ERP system via a data extractor.

The same statements can be made for Scopes 3.2 (capital goods) and 3.8 (leased assets).

Leasing enables an interesting room to maneuver with regards to the emissions. The lease agreement may allocate, who is responsible for the CO2 emissions associated with the use of the asset. This could include emissions from operation, maintenance, and end-of-life disposal. This room may enable interesting models: a leasing company that is not subject to IFRS and does not need any finance from capital market institutions may buy assets (including their sunk emissions) and may then lease them out to lessees that are – directly or indirectly – subject to IFRS. This enables the lessee to operate leased assets free of attributable carbon footprints. IFRS S2 appears to enable such models subject to the auditing practice that is yet to be established. It remains to be seen, whether such room for maneuver will also be enabled by IPSAS. Given the enormous amount of assets in a municipality, such creative scope would certainly be a point to consider.

2.4. Scope 3.5 - waste

Waste treatment represents a two-fold challenge.

On the one hand, ERP systems typically do not enable waste management apart from very specific cases, such as pharmaceuticals or the chemical industry, where there are legal obligations to comply with. From an ERP system perspective there are some points to consider:

- Is there a material type “waste”?
- Can it be linked to organizational processes, i.e., where they are generated?
- How far can disposal methods (combustion, landfill, recycling, etc.) be configured?
- Can these methods be associated with costs and footprints?

This will need to be included in the ICT landscape of an organization, whether into the ERP system or a stand-alone system that nevertheless needs to have access to ERP data.

The second issue is the method of disposal, where the focus on CO2 may have negative external effects. Combustion, for instance, saves fossil fuels and reduces the landfill volume, but it certainly creates emissions that need to be taken into account in Scope 3.5. The same applies to the end-of-life treatment in Scope 3.12. For reasons of CO2 avoidance, landfill may hence be selected, where combustion may be the better choice.

2.5. Concluding remarks

It should be noted that many of the Scope 3 items appear to have little application to the typical public sector entity, particularly most of the downstream entities. A public sector

entity, even in the municipal domain, creates a service, not a physical product. Hence, many of the downstream scopes have little to no application to the public sector.

3. Attributability

The GHG protocol [13] determines the boundaries of the organization under consideration and thereby the attributability of emissions (Chapter 3). Two methods of setting organizational boundaries may be chosen: equity share or financial control. One can see the difference in the examples in Table 1.

Table 1. Equity share vs. financial control

	Equity share	Financial control
Associated or affiliated companies	To the extent of the share	0%
Franchising (assuming no share in the franchisee and far-reaching financial influence of the franchise-giver)	0%	100%

Source: GHG protocol [14]

This has considerable repercussions on the planning of municipal service providers. An example could be the German "public transport privilege":

According to this privilege, the spun-off energy provider and the public transport provider of a municipality can offset each other's profits/losses. This is a considerable advantage, as public transport would typically operate at a loss, whereas energy is typically quite profitable and – being a spun-off company – would be liable to profit taxes. This "privilege" however can only be used if the municipality holds a majority share in the company. If private investors buy parts of the utilities providers, the formal majority is still maintained for that reason (typically 51%), however, the public and private shares are syndicated in a way that give the private investor the main profit share and effective control over the company (for instance, the municipality may only exercise 40% of its 51% voting rights according to the syndication).

This has repercussions on the attributability according to the GHG protocol. According to the financial control criteria, the emissions would have to be attributed exclusively to the private investor; according to the equity model, 51% would be attributable to the municipality. This may lead to interesting discussions as it is highly unlikely that the syndication contract between investor and municipality would have foreseen this.

Also, it is mandatory that each entity either applies the equity share or the financial control criteria uniformly over all its associated organisations. An investor owning stakes in maybe dozens of municipalities hence cannot pick and choose a different model for each municipality, but has to apply one uniform way of attribution. This will lead to rather interesting negotiation scenarios.

4. Data Requirements

The data requirements particularly in procurement will be considerable. For each part, the CO2 content needs to be ascertained and verified [15].The footprint also needs to be stored

in an information system in order to be retrievable for reporting. This by far exceeds the capabilities of the average government agency. Hence, central procurement agencies will play a much larger role in public procurement.

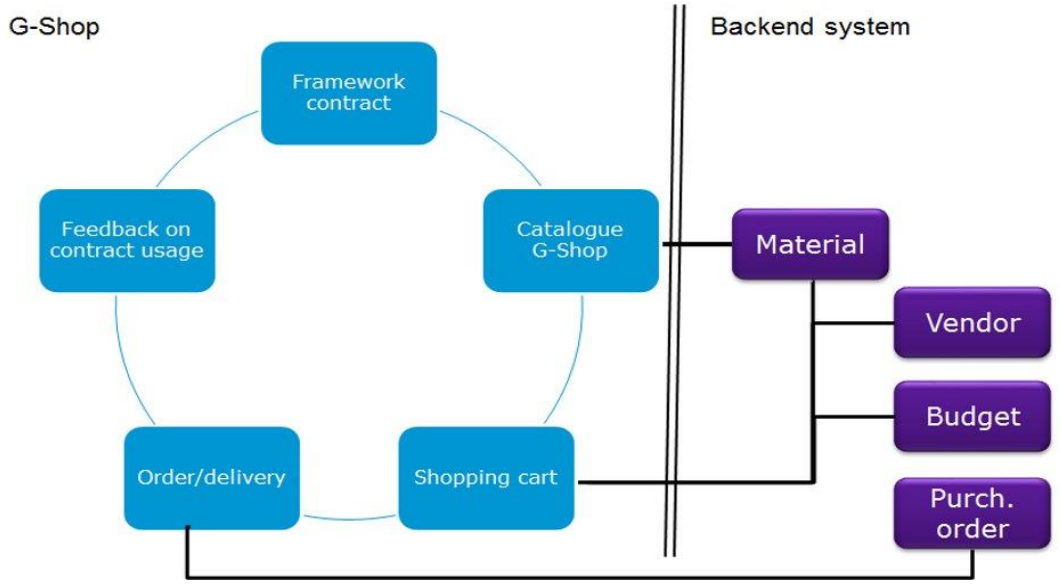

Fig. 1. Central procurement agency and the backend system
Source: Own depiction

The model is depicted in Figure 1. The central procurement agency organizes the tender procedure which includes an auditable framework for footprint declaration by the vendors.

Once the contract is awarded, the items (including their footprint information) are uploaded into the government catalogue and shop system (G-Shop). Government agencies then order from that shop composing a shopping cart and ordering it, possibly with an associated approval procedure. The backend processing will then typically be done in an ERP system.

The main issue here is that the footprint associated with each item in the catalogue is

- auditable;
- made transparent within the catalogue (similar to the price);
- attributed to the government agency ordering the item.

The last point is less stringent, if all orders come from the same level of government, for instance the federal level only. If, however, also regional authorities and municipalities use these services, correct attribution of footprints will become essential and must be covered by the information systems as well.

This will necessitate the large-scale usage of information systems, particularly ERP systems. The footprint information will then either have to be included in the ERP system or be managed by an add-on system, which however still needs access to ERP data.

5. Summary

IPSAS will soon include CO2 Accounting, whereby the footprint will influence the re-financing terms of a territorial entity. As far as the published information goes, the IPSAS Board will align themselves by the IFRS S2 standard to ensure maximum compatibility with the private financial sector.

The footprint information is organized in scopes that are intended to holistically cover the entire value chain from own consumption of electricity, operating a fleet of vehicles to procurement and waste management. This will massively affect the usage of information systems, particularly ERP systems, that must either be enhanced or supplemented with add-on systems managing the footprint information.

CO2 Accounting will therefore be a massive push for eGovernement and the digitization of public services.

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