Electronic invoice service
Oeste CIM, Portugal

- Dematerialisation of invoice processing by the 12 municipalities associated to Oeste CIM
- During the duration of the contract (3 years) savings of 8.7 t CO$_2$e and 7.3 toe
- During the duration of the contract (3 years) savings of 9.4 t of paper

Benchmark
Standard paper invoice service
- 4.4 t CO$_2$e/year
- 2.7 toe/year

GPP 2020 tender
Electronic invoice service
- 1.5 t CO$_2$e/year
- 0.2 toe/year

Results
- 2.9 t CO$_2$e/year
- 2.4 toe/year
- 8.7 t CO$_2$e/3 years
- 7.3 toe/3 years
Tender

- Contract Tender for the purchase of an electronic invoice service by Oeste CIM – Intermunicipal Community of the West, Portugal - to be provided to the 12 associated municipalities.
- 36 month contract for the development and maintenance of the electronic invoice system. The solution does not have an estimated end of life.
- Total cost: 36,000 € (excluding VAT).

Procurement approach

Oeste CIM aimed to acquire an electronic invoice solution that will serve its 12 municipalities. The electronic invoice solution offers substantial savings in paper and processing time of invoices. This process is part of the objective of the 12 municipalities to dematerialize some of their operations and achieve economic and environmental savings.

The tender followed a direct agreement procedure, after a brief consultation with the market to determine the technical parameters of the service.

The main objective was to achieve dematerialisation; as such no special environmental criteria were developed.

Results

This solution has no expected end of life. Thus, we present the result on an annual basis, for the contract time and for a 10 year period. We use the 10 year period as an indicator of the potential that this solution has to escalate with time.

- CO₂ and Energy consumption savings – 12 municipalities of Oeste CIM

<table>
<thead>
<tr>
<th></th>
<th>CO₂ emissions (t CO₂e)</th>
<th>Energy consumption (toe)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Low Carbon Solution (per year)</td>
<td>1.5</td>
<td>0.2</td>
</tr>
<tr>
<td>Benchmark (per year)</td>
<td>4.4</td>
<td>2.7</td>
</tr>
<tr>
<td>Savings (per year)</td>
<td>2.9</td>
<td>2.4</td>
</tr>
<tr>
<td>Savings (3 year contract)</td>
<td>8.7</td>
<td>7.3</td>
</tr>
<tr>
<td>Savings (10 years)</td>
<td>29.0</td>
<td>24.4</td>
</tr>
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</table>
• **Paper Savings – 12 municipalities of Oeste CIM**

<table>
<thead>
<tr>
<th>Period</th>
<th>Weight of the paper (t)</th>
<th>Sheets</th>
</tr>
</thead>
<tbody>
<tr>
<td>Savings (per year)</td>
<td>3.1</td>
<td>75,600 envelopes + 604,800 A4-print</td>
</tr>
<tr>
<td>Savings (3 year contract)</td>
<td>9.4</td>
<td>226,800 envelopes + 1,814,400 A4-prints</td>
</tr>
<tr>
<td>Savings (10 years)</td>
<td>31.3</td>
<td>756,600 envelopes + 6,048,000 A4-prints</td>
</tr>
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</table>

**Calculation basis**

In order to estimate the CO₂ and energy savings that will arise from the electronic invoice system, LNEG performed a screening LCA comparing two invoice systems:

• **Benchmark**: paper invoice, printed and sent by normal mail (road transportation) and processed by the municipalities to conclude payment. This is the current system in place.

• **Low carbon solution**: electronic invoice system. File produced by suppliers using the system, sent via internet to the municipalities electronic invoice system, and subsequently processed by the municipalities.

These systems include the following processes:

• **Benchmark:**
  - Production of paper (for A4 sheets and envelopes): forestation, mill and transport to supplier (information on CO₂-emissions and energy consumption taken from Ecoinvent 3).
  - Printing of paper: digital printing (information on CO₂-emissions and energy consumption taken from Ecoinvent 3).
  - Mail transport by road (light duty van - information on CO₂-emissions and energy consumption taken from Ecoinvent 3).

• **Low carbon solution:**
  - Operation of the servers where the electronic system is installed.
  - Operation of the desktop PCs by the municipalities' workers to process the invoices.

Not all processes were included. In some cases not enough information was available to model the process and in other cases it was assumed that the impact was not significant enough to justify their inclusion.

**Reference flows**

The two systems have different material and energy flows, so LNEG defined a reference flow for each one considering information provided by Oeste CIM.
Benchmark

- **Paper invoice**: 1 paper invoice consisting of an envelope and 2.5 80g/m² A4 printed paper sheets (on average).
- **Mail transportation and distribution**: Transport by road from the supplier to the municipality, done by a light duty van for an average of 50 km. The sorting by the mail services was ignored as it seems minor in terms of impacts.
- **Processing by the municipalities**: Each invoice originates a payment order that needs to be processed by the municipality. According to Oeste CIM, each payment order consists on average of 5.5 sheets of printed A4 paper.
- **Annual values**: Oeste CIM estimates that on average a municipality receives around 6,300 invoices per year. For the 12 municipalities this amounts to 75,600 paper invoices.

Low Carbon solution

- **Server operation**: The electronic invoice system is going to be hosted in a server to which users will have access via their desktops. No data was available that would allow to determine the energy consumption of the servers that could be allocated to the electronic invoice. In light of this limitation an average of the values provided by Moberg et al. (2008) of 3.9 Wh/electronic invoice for server operation was used.
- **Desktop operation**: Oeste CIM estimates that each invoice follows a process route that will include 5 municipality workers (including top management), and can take up to 30 minutes to fully process (from receiving to payment). It was assumed that the desktop-PCs have and active power similar to the one available in the GPP 2020 ICT CO₂ calculator (68.8 W), and considered the operation of the five PC as a global value, i.e., they were modelled as only one PC working for 30 minutes to process the invoice. The energy consumption in sleep mode and off mode was ignored, as this wouldn’t be significant when allocated to the invoice processing.

**Information sources:**

Data sources for the various systems and processes include EcoInvent 3, Oeste CIM, GPP 2020 ICT CO₂ calculator and the study by Moberg et al. (2008).

**Lessons learned**

This purchase represents a considerable process simplification and the natural evolution towards the modernization of the public services.

In the future, the use of electronic invoice services is going to be replicated in two other Intermunicipal Communities and is likely to expand even more, since it is more flexible and easy to use and eliminates completely the use of paper.
Oeste CIM has learned that to assure the success of the procedure, the users in the municipalities and the ERP (Enterprise Resource Planning) providers have to be involved and collaborate since the beginning.

Reference


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About GPP 2020

GPP 2020 aims to mainstream low-carbon procurement across Europe in support of the EU’s goals to achieve a 20% reduction in greenhouse gas emissions, a 20% increase in the share of renewable energy and a 20% increase in energy efficiency by 2020.

To this end, GPP 2020 will implement more than 100 low-carbon tenders, which will directly result in substantial CO₂ savings. Moreover, GPP 2020 is running a capacity building programme that includes trainings and exchange. – www.gpp2020.eu

About PRIMES

Across six countries in Europe; Denmark, Sweden, Latvia, Croatia, France and Italy, PRIMES project seeks to help municipalities overcome barriers in GPP processes, many of which lack capacity and knowledge.

PRIMES aims to develop basic skills and provide hands-on support for public purchasing organisations in order to overcome barriers and implement Green Public Purchasing. This will consequently result in energy savings and CO₂ reductions. – www.primes-eu.net

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