

A hand is shown holding a green plastic cup. The background is a bright yellow color with a pattern of white recycling symbols (triangles forming a circle). The text 'Making polluters pay' is overlaid on the image. 'Making' is in white, 'polluters' is in red, and 'pay' is in white.

# Making polluters pay

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Individuals are  
charged for  
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## Speeding up the waste management means better service for the community



In the Dutch city of Barendrecht, waste management has become more efficient and the city is cleaner, thanks to Mobitex. Together with business partners Diftar BV and Essent Milieu, Dutch Mobitex operator RAM Mobile Data has deployed an innovative yet simple solution that handles a variety of tasks from invoicing residents for waste disposal to routing the vehicles that collect the waste.

Waste disposal may not be the most glamorous application, but waste is a growing problem in today's society as people seem to generate more waste for each year that passes. Add to this growing concern for the environment, and it is not hard to understand why Dutch authorities are making polluters pay by charging individuals for the volume of waste that they generate.

Although the principle is both fair and simple, charging residents individually for the waste that they produce could easily become an administrative nightmare. Most municipalities therefore apply a more general pricing system whereby each household is charged a flat rate for waste disposal or pricing by volume or weight is determined for an entire building or a block of apartments. Dutch authorities, however, knew that they had to find a way to offset rapidly increasing costs for waste management.

### Monitoring underground containers

RAM Mobile Data and its business partners already had most of the components required for an effective solution. In the densely populated Netherlands where space is at a premium, Diftar had installed waste containers in several cities that are located underground with only a small opening at street level. In the system supplied by Diftar, these waste stations are opened using a personal smart card containing billing and other information. The system also supports prepaid functionality and can be used to limit access to only those containers located in the user's neighborhood.

Each container location (at which there may be several containers) is served by a monitoring system that includes a single-board computer (SBC) and a radio modem for transmitting data over the Mobitex network. Billing information is passed on to the relevant authority but is also used to generate a database that can be accessed via the Internet. Information generated at the container location and transmitted over RAM Mobile Data's network also includes status information for each container indicating whether or not it is functioning properly and the level of waste that it contains.

Because each container can wirelessly report when it becomes full, routing of collection vehicles becomes extremely efficient. Only those containers that are full need to be serviced, and the waste disposal company knows exactly how much waste will be collected. The two-way data communication

offered by Mobitex also allows faulty containers to be shut down remotely.

"This is not only an extremely cost-efficient system. Because the containers can be emptied before they become full, excess waste does not end up on the street beside the collection point, thus making the city cleaner and eliminating the manual handling that would otherwise be necessary," says Essent Milieu project manager Chrétien Thijssen.

### Generating billing information

In the project, Diftar BV was responsible for the electronics and hardware, as well as the web-based interface that allows users to check billing information. RAM Mobile data supplies the wireless communication network and hosting as a WASP (Wireless Application Service Provider), while Essent Milieu contributed the billing solution.

"As a service provider, we primarily target the authorities responsible for waste management, including data registration, transmission, collection and processing prior to deposition," says Chrétien Thijssen. "We do not try to cover the entire chain ourselves, but instead employ trusted external partners. When wireless data communication is required in our projects, we rely on RAM Mobile Data and its reliable Mobitex network. With the Mobitex network, data transmission is always guaranteed, meaning that billing information is never lost. Residents can be confident that the invoices they receive will be 100-percent correct."

The result of this collaboration is the integrated waste management system, which according to Thijssen is not only extremely reliable, but also highly flexible. Essent Milieu is therefore now studying how this partnership can be expanded to offer more customers a similar system.

"Evaluation of the project is now being conducted by independent expertise. Our expectation is that waste management will be seen as a sector in which external suppliers can play a greater role by providing information in a shorter period of time. Speeding up the waste management chain means better service for the community. In this respect, wireless data communications will have an even more important role to play," concludes Chrétien Thijssen. <

### Waste management on the web

The waste management system implemented by RAM Mobile Data and its business partners Diftar and Essent Milieu is actually a hosted application that the Dutch Mobitex operator could offer as a service to many municipalities. The system pioneered in Barendrecht could be deployed very quickly in other cities using the same type of containers.

As noted in the article, the new system is now being evaluated by independent experts. However, the benefits should be obvious. Not only is waste management speeded up and collection made much more efficient. The municipality is able to charge individuals for the volume of waste that they produce, thus ensuring that polluters will pay the full cost, while more environmentally aware residents who produce less waste will also be charged less.

The added cost of introducing wireless data and an individual billing system will naturally vary depending on the infrastructure and administrative systems already in place. Experience from this type of Mobitex applications, however, indicates that pay-back time is very short and typically 12 months or less.



*Because this container will signal when it is full, there is no risk that this bag will be left on the street.*