Electronic Recycling Done Right

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Peter Segga-Solomon Johnson, a production worker at Stena Metall, removes hazardous materials from fluorescent light frames.© Sven G. Simonsen

While consumers across the world increasingly recycle their old batteries, coffee makers and MP3 players, most electric and electronic waste from offices and factories still ends up in landfills. But in Norway, an industry-run program now collects 98% of such waste.

Industrial machines, high voltage equipment, escalators, pumps, generators and other machinery often pack more environmentally harmful materials than consumer goods. But governments have so far mostly failed to establish systems to take care of such waste. As a result, enormous amounts of hazardous materials and greenhouse gases are released into nature.

Ten years ago, that was also the case for Norway. Only 5% of electric and electronic (EE) waste from enterprises was collected. But in 1999, a program negotiated between the industry and the government came into effect, which in four years boosted the ratio to over 80%.

World Leader

"This is a great success story. Norway is clearly the world leader in the collection and recycling of EE waste," says Ellen Hambro, director of the Norwegian Pollution Control Authority. In the 1990s, she worked for the Ministry of the Environment, and she participated on

behalf of the government when the program was negotiated.

At the time, the Ministry was considering introducing new taxes as a solution to the problem of EE waste. The industry on its part asked for a time-out to prove that it could regulate itself. The solution became a model where the government set minimum targets for the industry, while the industry set up the institutional framework to make sure they were met.

The government insisted on an 80% collection ratio by 2004. "Too ambitious," suggested the industry, which nevertheless agreed to give it a try. A nonprofit enterprise, RENAS, was set up to administer the EE program. It didn't take long before it became clear that RENAS would actually exceed that target with good margin.

"In fact, whereas the European Union's WEEE directive, which regulates the collection of EE waste, has set a target of 4 kg per capita, in Norway 31 kg is collected per capita. The main reason for that is that a much broader range of waste is collected in Norway; the EU directive only covers consumer goods," Hambro says. "It is true that Norwegians also buy more EE goods, but 31 kg per person is a great achievement," she adds.

A Nice Journey

A large part of Norway's EE waste is processed at Stena Metall, one of Europe's largest recycling sites, outside Oslo. Here, workers dismantle every imaginable kind of discarded equipment, removing hazardous materials and optimising remaining parts for further treatment. Overall, the material recovery rate is well over 90%.

The size of the recycling market is to a large part a result of government regulation, explains Rune Stensli, Stena Metall's

business area manager for WEEE in Norway. "Laws and regulations are essential to the business. And the better regulated the waste market, the more we can invest to improve our techologies further."

Stensli recalls joining the company in 1996, just as it began recycling electric and electronic waste. "That year, we received and processed about 3-5 tons a day. Now, we process 150-200 tons per day. It’s been a nice journey."

Polluters Pay

To RENAS director Gunnar Murvold, the key to Norway’s recycling success lies in the model that was chosen. "In my opinion, state regulation and taxation is often sensible. But in some cases, it’s better to allow the industry to do things its own way. And this has proven to be one such case," Murvold says.

The baseline of the program is the principle that polluters pay. In practice, this means that RENAS collects a recycling fee from importers and producers on all EE goods that are imported or produced domestically. Participation in the program is mandatory.

For the buyers, on the other hand, recycling will be the most convenient and the only free-of-charge way of disposing of the goods when, in the future, they become waste. All carrots and no whip, in other words — which is key to explaining the scale of the RENAS success.

The fee that importers and producers pay varies, depending on the product and the overall cost of running the program. The average fee now stands at 0.3% of net value.

The main office of RENAS is a very small operation, with only four

staff. The collection of waste has been outsourced to 160 privately operated sites around the country that are paid according to how many tons they collect, with rates varying between product groups.

In sum, the performance is remarkable. Last year RENAS collected some 50,000 tons of EE waste. Given that the total population of the European Union (where Norway is not a member) is more than 100 times that of Norway's 4,5 million, and that the EU has not regulated the collection of EE waste from commercial enterprises, Murvold loosely estimates that a comparable 98% effectiveness across the EU would have prevented emissions of 27,000 tons of lead, 2000 tons of mercury and 20,000 tons of PCB over the last ten years.

Since 2001, RENAS has also been running the world's only program for the collection and recycling of SF6, a gas widely used in power plants. SF6 is a super-potent greenhouse gas, with a global warming potential 23,000 times that of carbon dioxide.

"Norway is the only country in the world where the EE industry has formally committed itself to reducing SF6 emissions," Murvold explains.

Whereas the government's target for SF6 collection was 30% by 2010, RENAS reached 55% already in 2008. "If we convert that into CO2 equivalents, on a European scale, the SF6 we have collected so far equals one year's emissions from 10 million cars," Murvold says.

Lobbies and Leadership

What is keeping other countries from being equally effective?

"Powerful lobbies, and weak politicians," suggests Murvold. Norway is a small and well-off country, but in his view that is not the main

reason why this has worked so well. "I think the main reason is the combination of visionary political leadership when the system was established, and the industry's readiness to take on the responsibility."

Ellen Hambro agrees. "I think the genius lies in the combination of a clear, law-regulated obligation, and a voluntary agreement where the industry takes on the responsibility. Cooperation between competing businesses may be easier with fewer players, but the principle could also work in a much bigger country."

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