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## A look inside the nation's rubbish bins

The Swiss recycle a great deal, which is exemplary. However, a look inside the nation's rubbish bins reveals that as salaries and prosperity rise, so automatically does the mountain of refuse. And the vast amounts of food that end up in the rubbish raise moral and ethical issues.

By Marc Lettau

Let's take a typical family and call them the Zubers. The four Zubers – two parents and two teenagers – sustain Switzerland's image as a clean nation. The Zubers always put their rubbish in the correct containers, and they participate with a degree of pedantry in recycling, a Swiss national sport. They conscientiously take waste glass, empty cans, batteries, PET bottles and old clothing to the collection points. The Zubers can be seen carrying organic waste to their local compost site. These "islands" in the everyday urban environment represent an interface between neat and tidy Switzerland and practical Switzerland. In early summer, the local residents gather here for the "compost share-out". The organic waste produces a rich soil ideal for growing geraniums or vegetables. It is handed out free of charge.

However, this is not all the Zubers do when it comes to rubbish. The family bundles up almost 700 kilos of waste paper over the year for recycling. The four family members provide the recycling industry with 1.4 tons of material in total. A further 1.4 tons of household garbage ends up in the rubbish bin. To be precise, 347 kilos of rubbish is recycled and 346 kilos disposed of as household garbage per person per year in Switzerland (2012). Here are the statistics to go with the Zubers' practices: 97% of waste paper is recycled in Switzerland; 96 out of 100 glass bottles are reutilised; the collection figures are good for aluminium (92%) and tinplate (86%); and the return of PET bottles (81%) and batteries (73%) is satisfactory.

### Toxins seep from landfill sites

A key principle in the Swiss refuse disposal system is that household garbage is no longer deposited in landfill sites but instead incinerated at specialist plants. A landfill ban on burnable waste has been in force since 2000. Now only the combustion residue, the cinders, is deposited in landfill sites. The shift from landfill to

waste incineration was a key part of the new environmental policy strategy. Michel Monteil, head of the Waste and Resources Division at the Federal Office for the Environment (FOEN), is aware that the general public draws different conclusions about the chimneys at the waste incinerators in light of the clouds rising from them. Every chimney is associated with the notion of air pollution. However, it is landfill sites that present a greater threat to the environment, he says. "Switzerland has decided against landfill sites because the gas methane, which is very harmful to the environment, is released from the landfill mass," remarks Monteil. Plastic waste,

which causes chemical reactions in the landfill mass, is partly responsible for the formation of methane. In contrast, the CO<sub>2</sub> produced during the incineration of garbage is comparatively harmless – but only because the Swiss waste incineration plants use sophisticated filter systems that prevent the emission of pollutants. Monteil also points out that another reason for abandoning landfill is that polluted effluent often seeps from conventional sites. If only the ashes produced during the incineration process are deposited, the risks to water and groundwater are greatly reduced: "The decision to focus on garbage incineration was a decision taken to im-



In 1897, the Zurich engineer Jakob Ochsner developed a dust-free waste disposal system and later on the legendary rubbish bin

prove climate protection and to prevent water pollution," he says.

It was also a decision taken by a nation with few natural resources to use all the energy found in waste. All of Switzerland's refuse incineration plants are significant energy providers. Heating for entire residential districts is provided from the waste heat. These plants also produce electricity that is fed into the grid. Power generated in this way today meets around 3% of Switzerland's total electricity requirements: "If the energy content of rubbish is put to use by incinerating, the use of other energy sources can be reduced," explains Monteil.

### Miners in the trash mountain

Vagrants and other poverty-stricken figures sifting through rubbish bins for useable items are a rare sight in Switzerland. Rumaging through rubbish is nevertheless part of everyday life in our alpine country, albeit using technically sophisticated methods enabled by the term "urban mining". At the Development Centre for Sustainable Man-

agement of Recyclable Waste and Resources in Hinwil, Zurich, for example, a lengthy process is used to search through the finely grained combustion residue from the incineration plant. Powerful magnets firstly pull iron from the cinders. The other metals are then sifted out. Aluminium and a fine mixture of copper, silver, zinc, lead and gold trickle out of the end of the high-tech system into the collection containers. The reclamation of copper is particularly productive. The amount of copper found in Swiss rubbish is similar to that in a viable copper mine. Urban mining is quite literally a gold mine for waste recycling firms owing to the high global market prices for metals. An estimated 150 to 250 kilograms of gold also end up in Swiss rubbish bins every year. This is found in the tiniest quantities, partly because many electronic devices contain small amounts of gold. Around 15% of this "discarded gold" can now be recovered.

Switzerland's urban mining is not just restricted to Zurich. All of Switzerland's 29 waste incinerators separate metals from the cinders. The search for metals also makes the plants cleaner. Large amounts of zinc can even be recovered today from the filter residue of flue gas cleaning installations. The hydrochloric acid required for this process also comes from the flue gas cleaning installation. Michel Monteil regards this as a stroke of good fortune: "The acid produced during combustion previously presented a problem for the waste incineration plants. Today it is the chemical that we use to recover a valuable metal. That's urban mining in the extreme."

Such success encourages urban miners to dream about even greater achievements. Their long-term goal is to separate all heavy metals entirely from the residue. "If this could be achieved, then the cinders could be used as a starting material in construction," explains Monteil. This would mean that very little burned waste would have to be disposed of in landfill sites. The household waste that the Zubers pack into bags and put out onto the street every week would almost completely become part of a closed loop. Monteil nevertheless concedes that there is still a very long way to go before such visions can be realised.

### Rising salaries, growing mountain

So, successful miners plough through the trash mountain and turn it into money. And

up and down the country people are contributing in their everyday lives towards the fact that Switzerland now recycles over half of all rubbish. But the situation is not entirely encouraging. One trend in particular is concerning – the mountain of rubbish is becoming bigger every year despite ever improved methods for recovering recyclable material. The amount of waste per person has more than doubled between 1970 and today. There is an obvious direct correlation between prosperity and the trash mountain. The volume of rubbish is increasing in parallel with rising gross domestic product. If people in Switzerland have more money, they produce more waste. Michel Monteil: "In Switzerland, we have not yet succeeded in uncoupling our prosperity from our consumption. The notion of the more prosperous we are, the more we consume still applies."

### Delicacies from the rubbish bin

A scene change. In the town of Zug, which has a high number of wealthy residents, blonde-haired Lotta Wyss searches through supermarket rubbish containers for food after closing time. The 19 year old has been fishing vegetables, fruit and bread from the rubbish for two years. Wyss is not poor; she is committed to a political cause. She refers to her actions as "a silent protest against the throw-away society". What she pulls out of the containers is "perfectly good food". The general use-by dates for food in Switzerland mean that far too much food still suitable for consumption ends up in the rubbish.

Lotta Wyss is drawing attention in her own way to an issue that Switzerland only really became aware of in 2011. The FAO, the Food and Agriculture Organization of the United Nations, gave the authorities a wake-up call at that time when it said that around one third of food produced for human consumption in Europe ends up in the garbage. In 2012, the WWF reiterated the point with a study on food waste in Switzerland, calculating that two million tons of perfectly good food is thrown away each year across the entire food chain.

Research work conducted at the University of Basel (João Almeida) and the Swiss Federal Institute of Technology Zurich (Claudio Beretta) has provided the data that Swiss authorities are also using today. The researchers' most surprising finding is

that consumers transgress the most. Swiss households do not adopt a frugal approach to food and are responsible for 45% of all food waste. Over 400 kilograms of food each year ends up in the garbage rather than the stomach at the home of our Zuber family. The WWF says that a small 320-gram meal per person is thrown away every day in Switzerland. Thirty per cent of the wastage is accounted for by the food industry, which rejects fruit and vegetables that are too big, too small and too misshapen to satisfy conceptions and aesthetic criteria that are too restrictive. By contrast, the food waste levels recorded in the retail sector are relatively low.

#### Ethically dubious

"The production of all the food never eaten in Switzerland – based on Swiss production conditions – requires a cultivation area of around 3,500 square kilometres," points out

Corina Gyssler, media officer at WWF Switzerland. In light of the scale involved, the experts at the Federal Office for Agriculture (FOAG) have also recognised that a serious problem exists. Vinzenz Jung and Werner Harder of the FOAG believe that the wastage of food is alarming from both an environmental and an ethical perspective. Harder: "Raw materials, such as non-renewable energy, fertilisers, fodder and drinking water, are also used for food that is thrown away." Pigs have been fed with soya, and forests in South America have been cut down for the cultivation of soya, in order to produce meat that is thrown in the bin: "For every piece of wasted meat, fodder is distributed in vain and the natural environment is put under unnecessary pressure."

The connections outlined by Harder are by no means trivial. Around 30% of total environmental pollution can be attributed to food consumption. If a third of the food produced for human consumption is wasted, this means that a tenth of environmental pollution is caused by food produced but never eaten. The fact that nobody would have to limit their food consumption if the wastage were avoided provides food for thought.

The moral and ethical aspect of food waste is tremendously important as, according to the FAO, the food thrown away worldwide would be sufficient to feed over three billion people. Switzerland cannot ignore such estimates, especially now in the wake of the food crisis of 2007 and 2008, when the number of malnourished people in the world soared from around 850 million to one billion. Vinzenz Jung believes that the environmental and ethical issues have become closely linked ever since: "By deploying resources for the production of foodstuffs that we ultimately discard, we are undermining the capacity of some of the world's population to feed themselves."

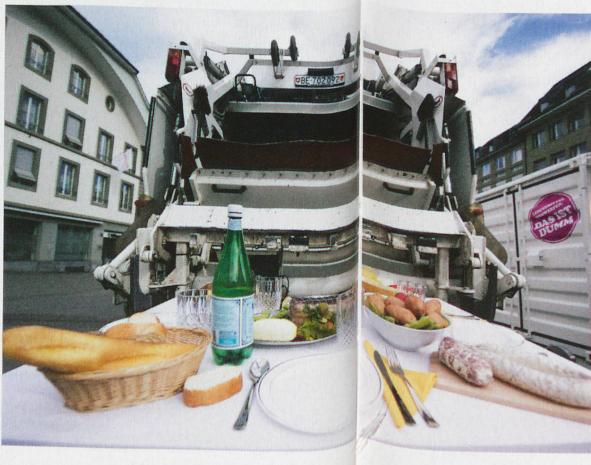
What needs to change? Werner Harder says: "Food is a means of survival. The value of nutrition must be better conveyed at school and as part of vocational training in future." Harder's objective in terms of raising awareness is simple – we need to relearn whether food is edible using our own senses. "Unopened yoghurts are often thrown out today with a mere glance at the expired use-by dates." The aim must be to



Reusable materials, such as copper, aluminium and even gold, are sorted out from the cinders of waste incineration plants



If disposed of properly, the huge amounts of green waste produced in gardens and kitchens becomes compost for the garden



Around a third of Europe's food ends up in the bin. Photo from the "food waste" exhibition in Basel

at least open the lid: "In all likelihood, it will still be perfectly good."

However, federal government does not wish to delegate all responsibility to educational institutions. The FOAG, together with other federal offices, has engaged in expert dialogue with all stakeholders in the food chain from the field to the plate. The goal is to convince all parties concerned to make a contribution towards reducing wastage – producers, the food processing sector, retailers and, in particular, the catering industry. Federal government has also initiated dialogue among researchers. The Federal Food Safety and Veterinary Office, which was newly founded at the beginning of 2014, will address the pressing issue of whether and how Switzerland should introduce new regulations on the dating of foods.

#### Coop has responded

However, Switzerland has no wish to set specific objectives with regard to food waste, in contrast to the EU, which plans to reduce it by 50% by 2050. Harder: "You can set such a target, but the costs involved in regularly and comprehensively recording waste quantities in order to measure target attainment would be unfeasible." The agricultural expert nevertheless remains confident even without benchmarks: "I am delighted that so many initiatives aimed at reducing food waste have been launched in Switzerland within such as short space of time." Jung also believes there is a relatively high level of willingness to understand the problem: "Many consumers change their behaviour when they realise the scale of what is being wasted." The market bears out his viewpoint. Coop, a major supermarket chain, introduced the "Únique" label in summer 2013 – this is for "fruit and vegetables deviating from the norm", which reveal "the vagaries of nature". Crooked carrots, oversized cauliflowers and apricots slightly blemished by hailstorms have since returned to the shelves and have sold extremely well.

Switzerland aims to obtain a much more accurate understanding of waste disposal behaviour and meticulously examines the nation's rubbish bins every ten years. As part of the latest "rubbish bag study", the household garbage from over 30 selected communes was scrutinised on behalf of federal government and carefully sorted,

weighed and analysed according to 23 criteria. The results of the analysis will be published in spring. Harder and Jung are particularly anxious to learn one figure – the amount of food in its original packaging ending up in the rubbish will also be recorded for the first time.

#### The Zubers require 2.8 planets

And what does the future hold? Michel Monteil of the FOEN says that Switzerland is today capable of resolving highly complex refuse management issues but the possibility of new products and new consumer habits presenting new waste and environmental problems can never be ruled out.

Observed objectively, the main problem remains the fact that the Swiss consume too many raw materials. "If everyone lived as we do in Switzerland, we would need 2.8 planets," reveals Monteil. The Federal Council aims to address this excessive environmental footprint by focussing efforts on a green economy. According to its "Green Economy Action Plan", raw materials and energy are to be used much more efficiently in future than at present in Switzerland. The approach will also target more rigorous environmental legislation, less food waste and the expansion of recycling activities in the aim of reducing the environmental footprint of the Swiss to 1.8 instead of 2.8 planets within 30 years.

But not everybody is applauding. Sectors of the economy fear State interference. Several environmental organisations would like to see more radical plans. The Green Party wants binding targets and is calling for a green economy and "One Earth" objective by 2050 through a popular initiative. Fundamental critics who argue that a truly better world cannot be achieved without sacrifice are also entering the political debate – even a "green" T-shirt comes at an environmental cost, they say.