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The scope of eco-innovation in the Swiss waste management sector

Maxime Jean Zufferey, Master's Graduate, Development Studies, The Graduate Institute

Over the past decade, Switzerland has gradually moved environmental concerns up the political agenda by making climate action a priority, most recently reaffirming its ambition to achieve carbon neutrality by 2050 (OFEV, 2020).

One of the main challenges for Switzerland is therefore to reduce current resource-intensive consumption and production patterns since the average Swiss person's lifestyle requires resources equivalent to those of three Earths. This striking figure highlights the unsustainable nature of current linear consumption practices (Hy et al., 2015). And what other sector than waste management can exemplify this better?

A Swiss waste management system at a crossroads

The paradox of Switzerland lies in its position as one of the best recyclers but also one of the largest producers of waste in the OECD (CleantechAlps, 2014). While it seems that over the last decade a transition has started with a reduction in material consumption and a trend towards more integrated rather than end-of-pipe technologies, this hoped-for transition remains limited. The recycling rate is stagnant and the production of municipal solid waste per capita is only marginally decreasing (*Figure 1*).

Switzerland needs more radical changes involving the adoption of innovative prac-

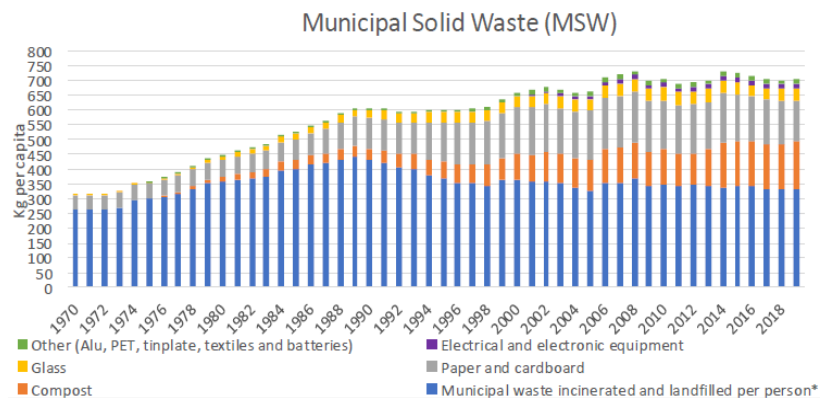


Figure 1: Municipal Solid Waste per Capita (MSWIs et al., 2021, March 19)

tices in the waste management sector and a shift to a more circular waste hierarchy focusing on slowing down the material at the source. This implies optimizing the use of resources, extending the life of products, and promoting reduction, reuse, repair and ultimately recycling solutions (Stahel, 2016).

More than technological eco-innovation, a stronger institutional framework is required

Eco-innovation encompasses technological, institutional, social, and organizational innovations. Although technological eco-innovations – e.g. technologies aiming to reduce resource use and raw materials – play an important role, they are not a panacea (Rennings, 2000). Research shows that most technologies in the waste sector are rather low-tech, already available, and mature and it does not make sense to wait for a technological revolution before addressing the problem.

What seems to be missing instead is a stronger institutional framework with more ambitious waste management policies than the current liberal framework based on voluntary initiatives and incentive policies. The framework based on self-responsibility seems to have paid off in terms of good waste sorting and resource efficiency, as these actions have a direct economic benefit or offer a cheap way to satisfy people's environmental commitment without overly constraining the linear consumption model.

However, this approach remains resource-intensive and does not really encourage the behavioral change needed to prevent and better reuse waste. Other closing-loop solutions are not yet economically competitive in Switzerland, as it is often cheaper and more accessible to buy new than to repair the majority of common objects or to buy second-hand. This problem is amplified in Switzerland by the high cost

of labor combined with low raw materials prices.

The way forward

The transition to a more integrated and circular resource management system will require a better internalization of environmental externalities, with prices of raw materials that reflect their real cost and scarcity, as well as a paradigm shift to overcome the current path dependency that economically locks consumers and producers into a linear and resource-intensive pattern.

Taking advantage of a certain momentum, notably instilled by the development of the EU Circular Economy (CE) policy framework, it seems appropriate to promptly implement more integrated policies in this area of waste recovery. The establishment of a national policy framework for resource management and quantified long-term targets for waste reduction and recovery processes, as well as more rigorous green taxes, could send a strong signal to the market about the future direction of production and consumption. In addition, significant efforts are needed to overcome current social norms and shift the discourse and negative perception of waste and secondary materials towards greater social acceptance.

From a technological point of view, Switzerland must be able to capitalize on its undeniable capacity for innovation and its good physical and financial pool to strengthen its position in the development of eco-innovations. To do so, an increase in the share of environmental R&D and the promotion of partnerships with private capital could be a good way to escape the «valley of death» that prevents many inventions from being born.

Construction sector

The construction sector is the largest generator of waste in Switzerland and its legislation on resource recovery is currently weak, as evidenced by the SIA 430 standard, which appears outdated and non-binding. The harmonization of the national legislation requiring precise objectives in terms of recycling rates per building site – as already proposed by the European legislations or at the level of the cantonal regulations of Geneva or Zurich – would allow being less dependent on the goodwill of the builders. The interpellation (21.3196) recently submitted by the State Councilor, Adèle Thorens, on the potential adoption of a digital «material passport» based on the European policy framework for sustainable products would offer concrete support to organize the CE transparently and would allow the integration of

the challenge of the long-term vision in the construction sector.

Municipal solid waste

For municipal solid waste, expanding new extended producer responsibility schemes to make companies more accountable for their products or the integration of buyers into the production chain offer opportunities to change market behavior. This change can be achieved by enacting federal measures to slow the flow of materials, such as extending product warranties to avoid programmed obsolescence, improving access to spare parts at reasonable prices, or introducing a reparability index. In general, new legislation, such as the current CE parliamentary initiative (20.433) on the design of products that facilitate disassembly, repair, or recycling, can achieve similar results. Finally, new consumption patterns could also be encouraged and facilitated by repair vouchers or a more favorable tax regime to make these labor-intensive solutions more competitive.

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CENTRE FOR INTERNATIONAL ENVIRONMENTAL STUDIES

GRADUATE INSTITUTE OF INTERNATIONAL AND DEVELOPMENT STUDIES

Case postale 1672, 1211 Genève 1

T +41 22 908 44 61

cies@graduateinstitute.ch

www.graduateinstitute.ch/cies