

Overview

Introduction

The energy content based on lower heating value of all waste fractions in Switzerland summed up to 124'000 TJ in 2012. With 63'800 TJ, municipal solid waste (MSW) contributes significantly to the energetic potential of the Swiss waste management. MSW highlights two areas for further optimisation: (i) increasing the current average electricity and heat-recovery efficiency from waste incineration (direct energy savings), and (ii) optimising material recycling from the waste (indirect savings). Chemical and pharmaceutical sectors are responsible for ca 15% of industrial energy demand in Switzerland. Considerable amounts of high-calorific residues accrue in these sectors, and appropriate management of these industrial wastes (IW) can also lead to substantial energy savings.

Structure

The joint project 'wastEturn' consists in four subprojects (SP; Fig. 1). Each of them addresses technological, systemic and application-related aspects in the corresponding field. The four subprojects together cover all 3 pillars of sustainability to reach an overall optimisation of the system. Close collaboration with several external partners and stakeholders (Fig. 1), both bilaterally within subprojects and through the project's two advisory boards, ensures a strong link to practical issues.

Objectives

The *wastEturn* project aims to:

- identify and assess potential measures to increase eco-efficiency of the most energy-relevant waste streams;
- evaluate the financial viability of an environmentally optimal waste management;
- analyse barriers and drivers of the transition to optimal waste management systems and assess strategies for practical application;
- support implementation and operation of Waste-to-Energy (WtE) systems through models dealing with planning and scheduling problems under uncertainty;
- foster capacity building among industry, policy-makers, and academia in the direction of resource efficient waste management systems and sustainable development.

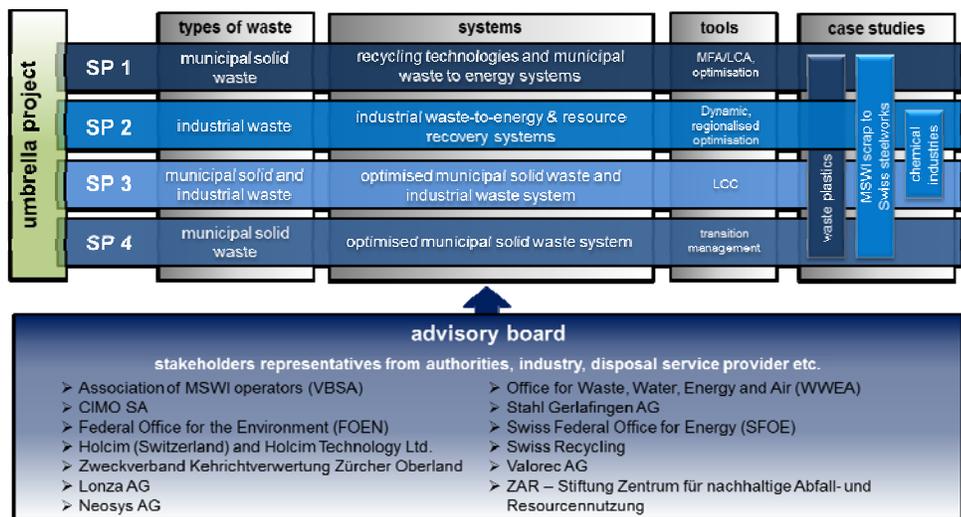


Fig. 1: Organisational scheme of the joint project. (SP: Subproject, MFA: Material Flow Analysis, IW: industrial waste, LCA: Life Cycle Analysis, LCC: Life Cycle Costing, MSW: Municipal Solid Waste, MSWI: Municipal Solid Waste Incineration, WtE: Waste-to-Energy).

Subprojects



The four subprojects were set up to cover the most important waste streams (IW and MSW) and to jointly cover all three pillars of sustainability. All subprojects are closely interlinked by information exchange, methodology transfer and common case studies encompassing various key waste flows (Fig. 1)

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|-------------|--|
| Environment | <p>SP 1: Optimising the energy recovery and the sustainability of Swiss municipal solid waste management;
Project leader: Stefanie Hellweg, ETH Zürich, ESD</p> <p>SP 2: Optimisation of industrial waste-to-energy (WtE) and resource recovery systems;
Project leader: Konrad Hungerbühler, ETH Zürich, SETG</p> |
| Economy | <p>SP 3: Economic assessment of industrial and municipal waste treatment options and waste-to-energy (WtE) systems;
Project leader: Christoph Hugli, FHNW</p> |
| Society | <p>SP 4: Initiating transitions of Swiss municipal solid waste management (InTraWaste);
Project leader: Michael Stauffacher, ETH Zürich, NSSI</p> |

Energy Turnaround

MSW and IW management in Switzerland show a large improvement potential in terms of direct (Fig. 2) and indirect energy savings. The joint project *wastEturn* aims at optimising the contribution of the Swiss waste management system to the Energy Turnaround, under consideration of environmental and economic performance, and to develop socially robust transition strategies for its implementation.

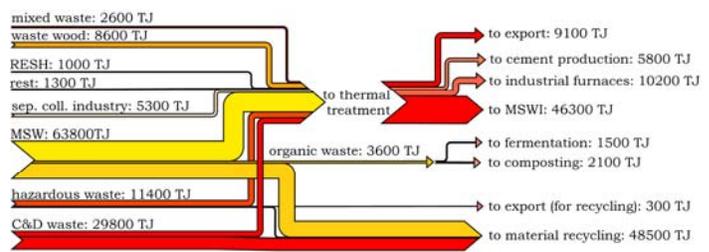


Fig. 1: Energy flow analysis of Swiss Waste management 2012. (RESH: residues from shredding, C&D: construction and demolition, MSWI: MSW incineration)

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