

CLEAN CYCLES & FINAL SINKS

Key Issues for Sustainable Waste Management

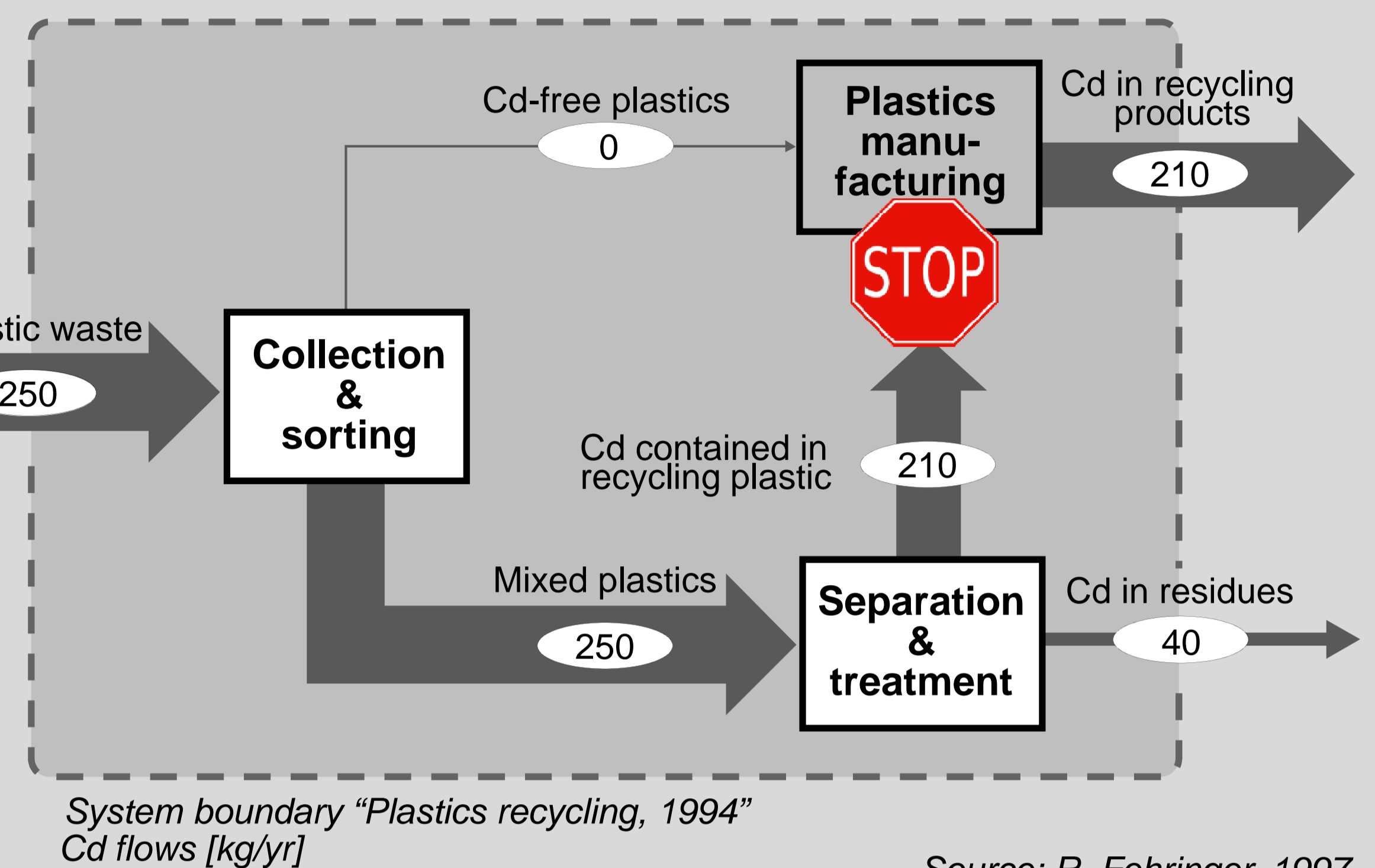
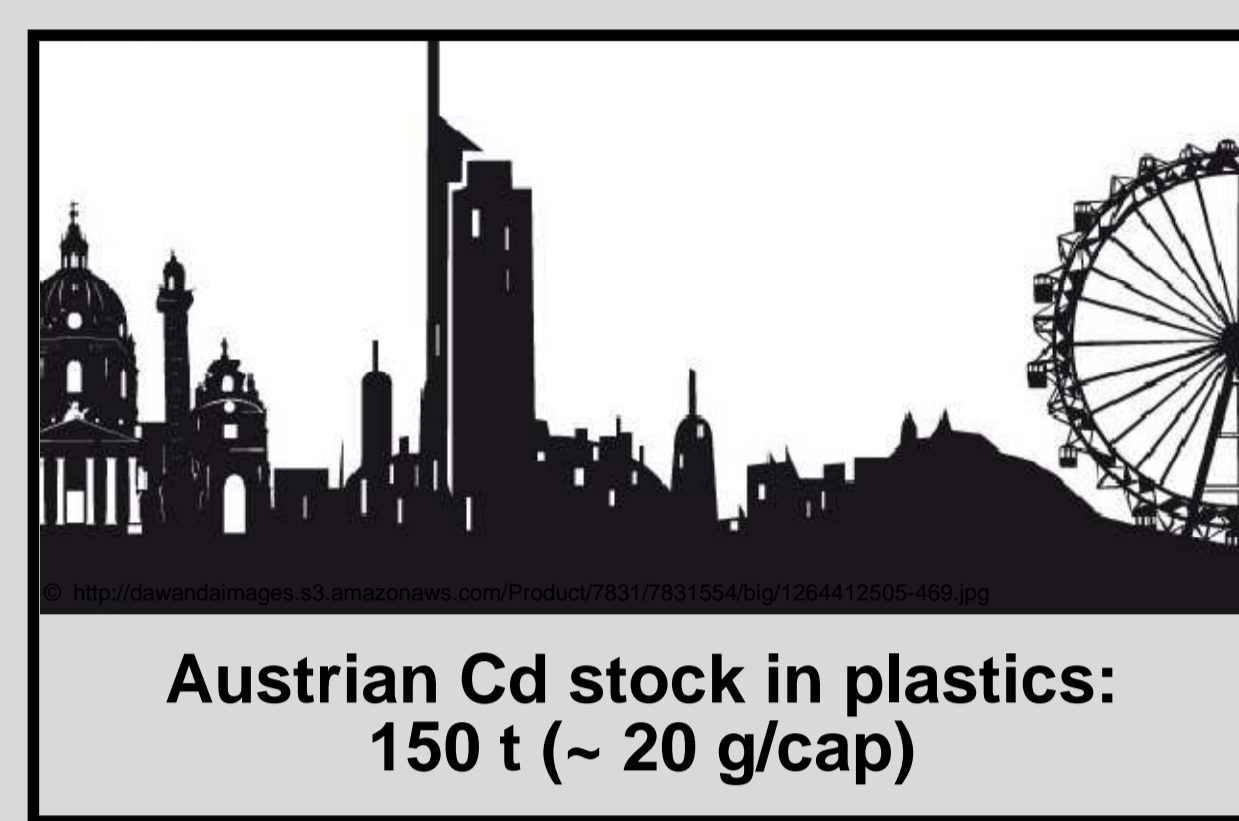
Today, regulation concentrates on quantitative recycling, without taking qualitative aspects of recycling material into account. For high quality recycling products and for environmental protection, a 'clean cycle' strategy is mandatory, removing detrimental substances from cycles.

Problem

Cadmium from plastic stocks contaminates plastic recycling systems

After December 2011, Cadmium will be banned from all plastic products by the EU. Due to large stocks of 'old' plastics containing Cadmium, strategies are necessary to prevent them entering secondary plastic products.

CADMIUM in recycling plastic



Source: Reisinger et al., 2009

Source: R. Fehring, 1997

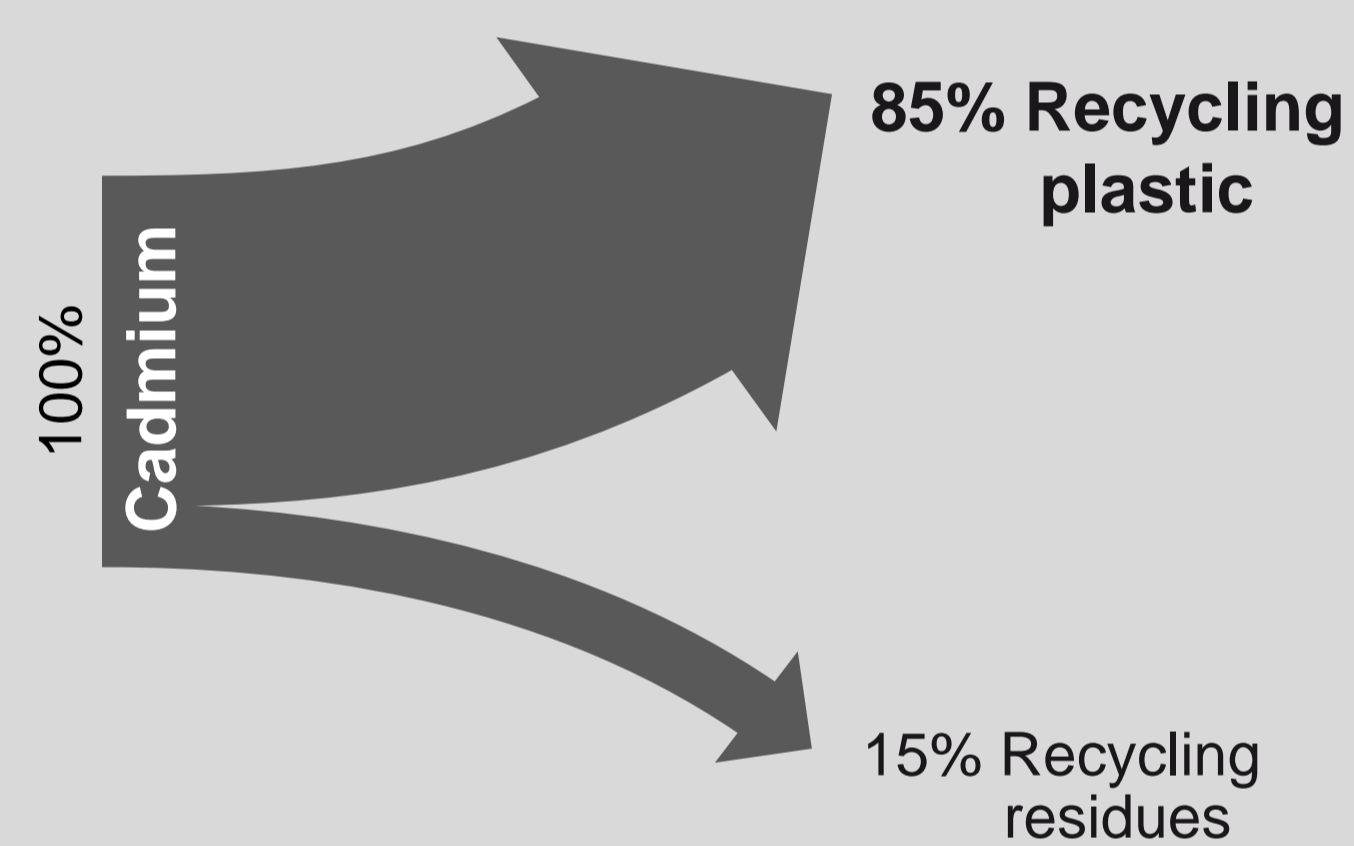
Approach

Technologies to remove Cadmium from cycles need to be identified

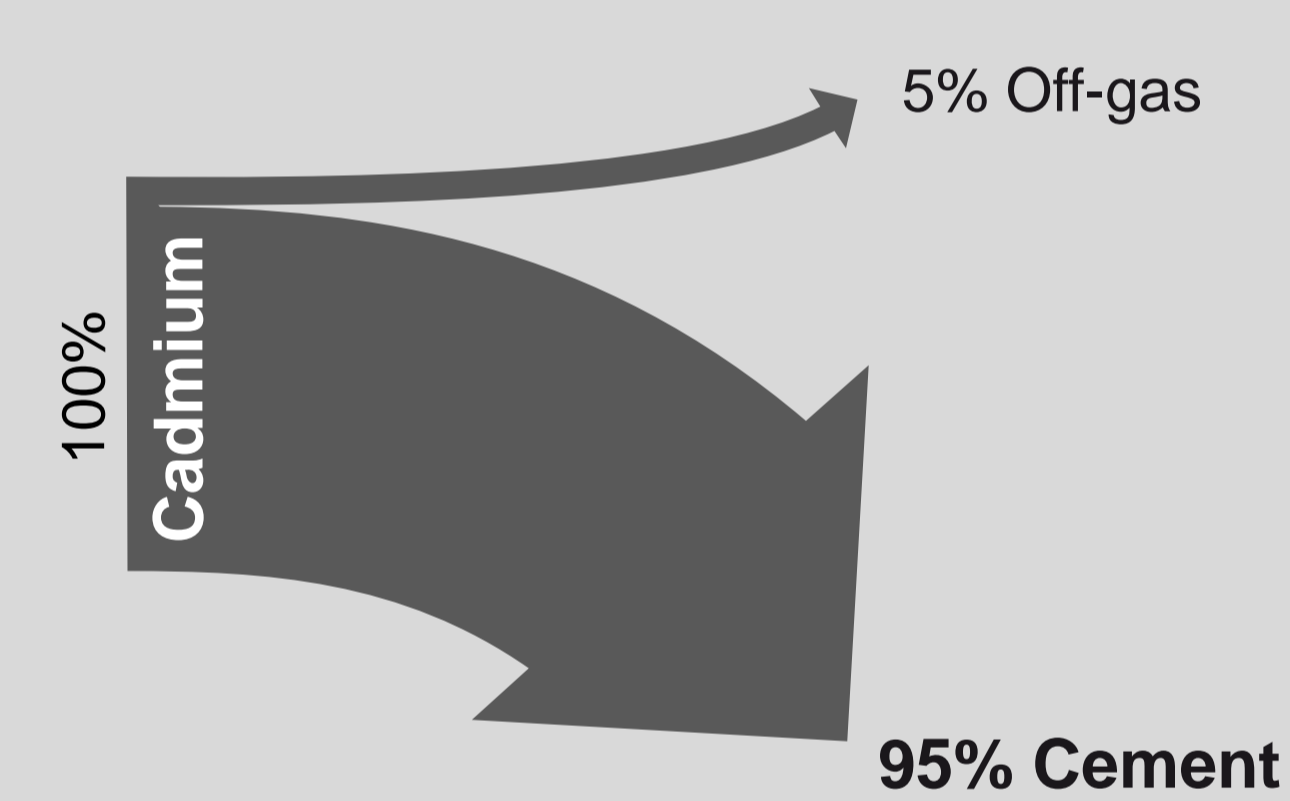
Using substance flow analysis (SFA) hazardous constituents must be identified, and technologies for their removal must be developed.

If recycling does not offer separation potential for specific substances other treatment options need to be considered.

Mixed plastics recycling

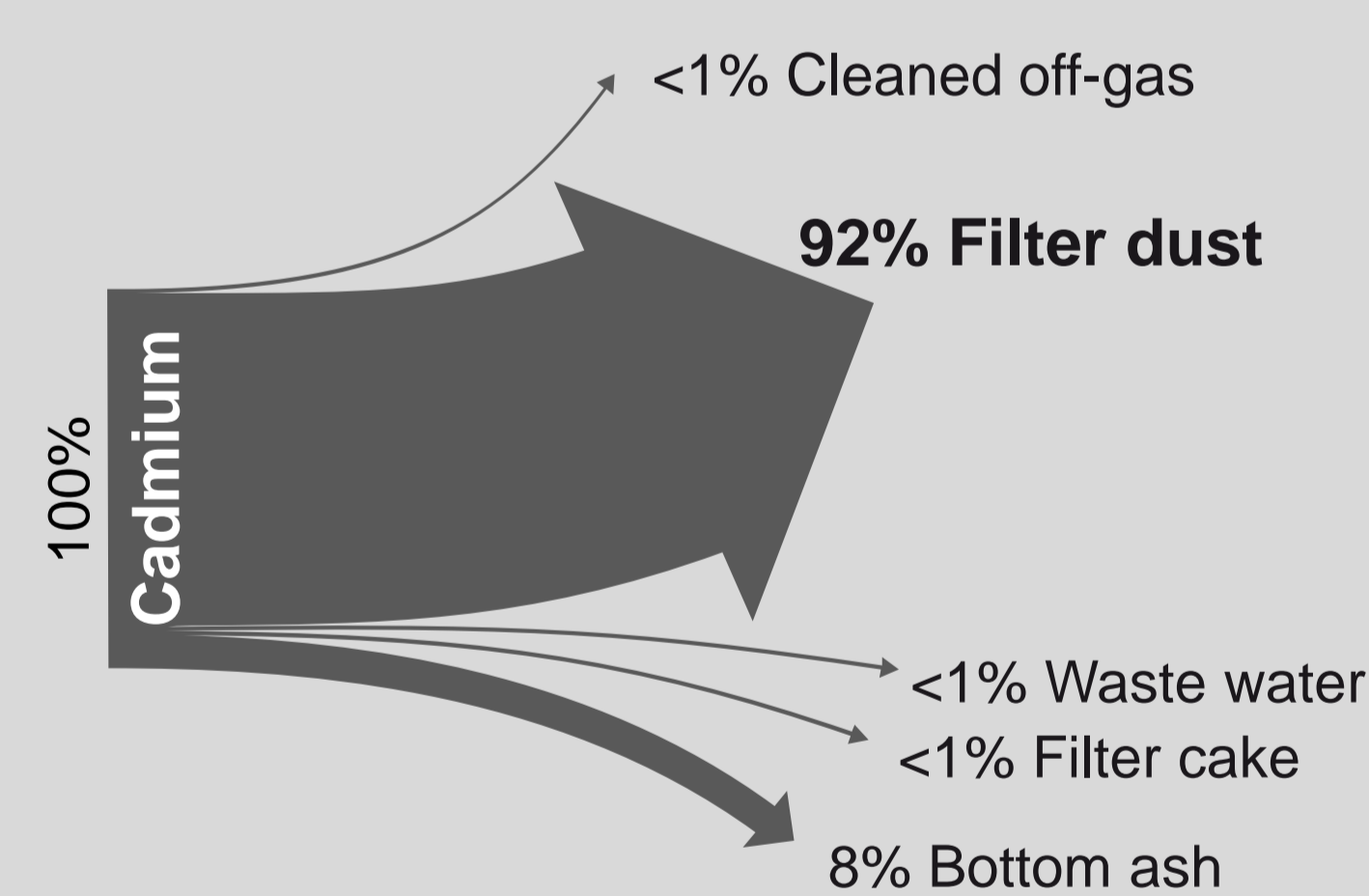


Cement kiln



In both cases, Cd enters product cycles again

Thermal treatment

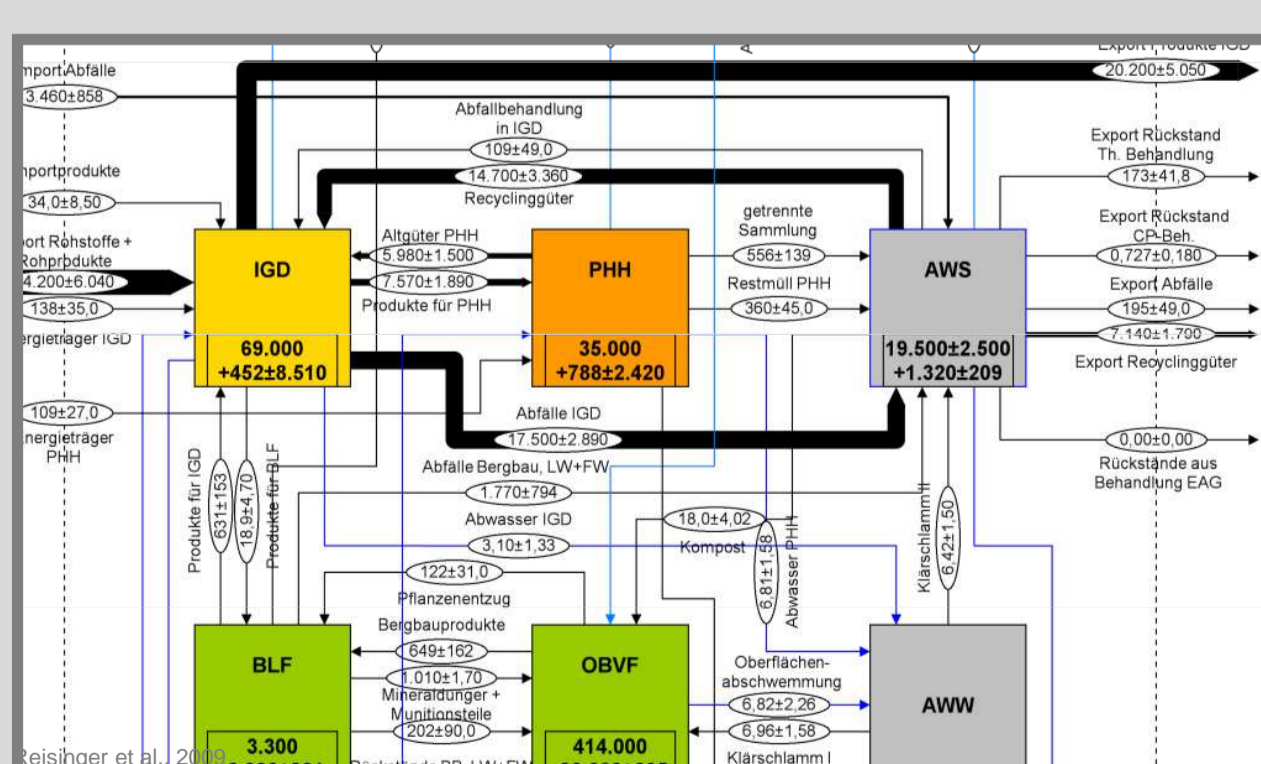


Cd leaves product cycle (e.g. is directed into underground storage as a final sink)

Source: R. Fehring, 1997

Solution

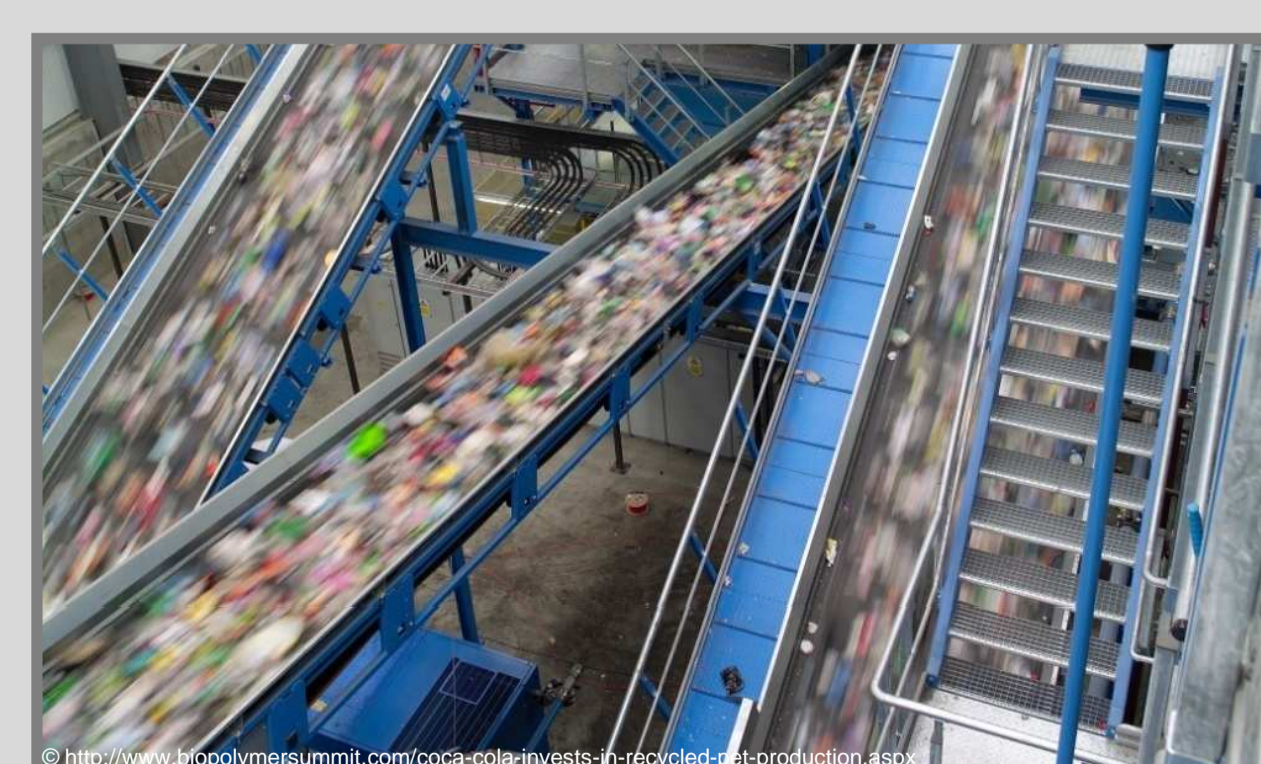
A 'clean cycle' strategy for plastic wastes involves four measures



Substance flow analysis



Sophisticated logistics



Advanced sorting and recycling technologies



Final sinks (e.g., thermal treatment, underground storage)