Even the waste from the recycling process has value. The paper industry is looking at more and more ways to stop that waste going to landfill or incineration, by adding value back to the waste, either for papermaking or for other industries.

When paper is recycled, various solid by-streams are formed which contain unwanted materials, or useful materials that are accidentally removed from the production line. These streams are often treated as rejects that need to be disposed of as cheaply as possible. However, these streams may have other potential uses which could generate more value and this is something the paper industry is working on closely.

**A WINNING COMBO**

Finnish producer UPM has come up with ProFi, a wood-plastic composite which combines the best characteristics of cellulose fibres and plastic. The main ingredients for UPM ProFi are recycled paper and plastic that are left over from UPM’s self-adhesive label stock production.

UPM ProFi is a material, which can be disposed of through incineration or recycled back into the production process to continue the loop.

**NEW LIFE FOR SLUDGE**

At SCA’s Lilla Edet mill in western Sweden, ash from the sludge-burning process is being used as a construction material for forest roads, as a binder in asphalt, and to raise the pH of farm soil.

**BUILDING BLOCKS**

**sappi** At SAPPi’s mills, they like to use waste sludge from the production process in applications such as the manufacturing of bricks or cement. The dried residual paper sludge from its waste water remains popular as animal bedding material, particularly for cows in local farms. Farmers say their cows are happier sleeping on this dried waste sludge than with more traditional bedfellows of sawdust and straw. The material keeps the animals cleaner, as it is less sticky. And improved hygiene also means healthier cows, and therefore better quality milk.

**RISING FROM THE ASHES**

Metsä Forest in Finland provides ash fertilization services for forest owners – some 5% of its waste becomes fertiliser. Both lime mud and fibre sludge (left over from the pulp production process) also have great potential in fertilization and soil improvement. The pure wood ash is rich in potassium and phosphorous, making it ideal for returning nutrients back to the soil where the new forests for paper are growing.

In Portugal, residues from the pulp process are also used to for soil restoration. After a long research and development programme lead by the PortucelSoporcel Group, several principles were defined for safe utilisation. For 10 years now residuals are applied to forestry soils under strict rules and permanent monitoring. In the dry southern soils with very low organic matter, this supply of ashes and mud has helped to increase health in oak, pine and eucalyptus forestlands.
Hundred percent recycling

While it’s just not possible to recycle 100% of all post-consumer used paper, UPM Raflatac is doing all it can to ensure zero wastage. As well as gathering the recyclable waste from its own mill, it takes the waste from its customers’ mills too. This waste is turned into energy and steam that can be used in electricity production in the company’s power plant in Rauma, Finland. The resultant residual steam heats the rolls of the paper machines, so the mill doesn’t have to rely on fossil fuels. Any surplus is directed to the district heating grid for the city of Rauma.

The idea is zero waste and maximum recycling: By-products generated in Raflatac’s business are used as raw material for the company’s ProFi wood plastic composite, as energy at UPM’s paper mills, or as a raw material for paper. They’re the same by-products that would once have ended up in waste incineration plants or landfill sites. Not anymore.

Even starch gets a second change

New recycling technology means that these days even the starch in paper for recycling can be recovered. This increases the yield of new papers made from old ones, it improves their strength, and eliminates the issues caused by degraded starch in used papers when they’re being made into something new. It also means fewer pollutants in the mill’s effluent.

(Source: Ashland)

Recycling residues

There are many different ways to put the by-streams from paper production to good use. They can be used as feedstock in production, converted into energy or energy carriers, or used in their current state. The technologies used also vary from conventional methods such as composting and incineration to highly-innovative technologies such as fermentation to produce bio-chemicals.

Within the mills themselves, by-stream products can become many things, from energy to new feedstock (for low-quality paper grades) and a source of minerals, recycled from sludge ash.

(Source: Maximum value from paper for recycling - Towards a multi-product paper mill, CEPI)

More information at

www.cepi.org/resourceefficiency