June 2019

What happens to my recycling and residual waste once collected from the kerbside?

Recycling and residual waste material collected in Powys is delivered to the nearest regional transfer station to be bulked prior to onward haulage to reprocessors (with a few exceptions of material being directly delivered from the collection vehicles to the reprocessor).

How is it processed?

Where possible, all of Powys' kerbside materials are sent for processing within Wales, but some material is processed in England. No material travels further than this to be processed in the first instance.

Food Waste

Our County's food waste is currently taken to an anaerobic digestion (AD) plant in Bridgend. Here, bacteria breakdown the solid food waste in the absence of oxygen. This is a highly efficient process allowing for upwards of 98% of inputted food waste to be directly recycled. The end product is fertiliser feedstock for reuse in the agricultural sector. Due to the AD process, a considerable quantity of methane is also produced, which is harvested and used as biogas to generate electricity for the National Grid. All of the recycling processes, as well as the use of the resulting gases, is conducted at the same site. The remaining material (<2%, typically made up of large bones, plastic and other contaminants that did not break down during the slurry process) is sent for incineration, also to produce electricity for the National Grid, but at a different facility. There is a further recycled component from the bottom ashes produced post-incineration, which is used as a component in cement manufacture.

Paper/Card

Collected mixed, our kerbside paper/cardboard is currently sent for sorting at a facility in Deeside, Flintshire. From here, the paper and low grade cardboard is sent to a paper mill in Norfolk. The better grade cardboard is sent to a different mill near Manchester. It is then further sorted at these sites into more specific grades. Each grade is then turned back into pulp to be fed back into the manufacture of new paper or cardboard. This is also a very efficient process with upwards of 99% of this material being recycled. The remaining material consists of adhesive tape and staples etc., separated from the paper and cardboard. Any metal material is recovered and recycled, while the plastics and adhesives etc. are incinerated on site to provide power for the plant's operations.

Glass

Our glass is currently sent to a reprocessor with facilities in Cwmbran, Torfaen and Ellesmere Port, Cheshire. The majority of our material ends up in Cwmbran, with Ellesmere primarily used when the former is at capacity. At these sites, the material is crushed and undergoes magnetic and 'eddy current' sorting to separate any metal components from the glass. Further mechanical sorting removes plastic or paper (all from bottle lids, caps and labels etc.). The crushed glass, known as 'cullet', is then either sorted by colour, then made into new glass bottles or containers, or more commonly is sent mixed to fibre glass insulation manufacturers as feedstock for their production process. More rarely, the glass can be graded by grain size and used as a component in construction aggregates, though usually for poorer quality material. Given the very small size, poor quality and mixed composition of the paper/plastic fraction, this is usually incinerated for electricity production but can sometimes be landfilled. As with other incinerated reject material, the bottom ashes are recovered and used as raw material in cement manufacture. The metals are bulked up and sent on to reprocessors to be

shredded and smelted back into metal feedstock. The amount of incinerated/landfilled material rarely exceeds 5% resulting in an average recycling rate for our glass material collected of upwards of 95%.

Cans & Plastics

Our co-mingled cans and plastics are delivered to our transfer station in Llanwern, Brecon, where magnetic and 'eddy current' separation is used to isolate the steel and aluminium cans, respectively, from the plastics. These three sub-streams are then baled and sent for further processing. The aluminium cans are shredded and smelted back into new aluminium feedstock, currently at a facility in Cheshire. They are most commonly turned back into aluminium cans, but can also become car parts and other aluminium items. The steel cans are currently processed by a steelworks in Port Talbot, and are similarly shredded and smelted into new cans or other steel products. The plastics are currently taken to a Materials Recovery Facility (MRF) in Derbyshire, which optically separates them into the individual polymer types, where possible. The same company is also able to directly recycle PET [1], HDPE [2] and PP [5] into new products at their sister sites in the East Midlands. These polymers typically make up anywhere between 70 - 85% of the plastics stream and are shredded into pellets which are melted and extruded into new products. Due to the generally poor quality of the recovered PVC [3] and its limited recyclability, this material is not currently recycled. It cannot be incinerated for electricity production either, due to the presence of chlorine, and so is landfilled. This is a low proportion of the overall material, however, representing <2% in 2018/19. PS [6] in the form commonly used in food containers is also of poor recyclability and is sent, along with any remaining contaminants (film wraps from drinks bottles, paper labels etc.), for incineration for electricity production in Europe (typically Germany but also Belgium), where there is a more established market for solid recovered fuels. The 'fines' (sub-50 mm material) are sent to a UK based facility and turned into fuel which is used to power cement kilns in the North and East of England. The ashes produced from this are also used as raw material within the manufacture of cement, enabling further recovery of material. Despite Powys sorting the cans from the plastics at our MRF, some metals do make it through to the plastics stream, and so there is also a minor output of metal material from this company's MRF, which is also sent for recycling. Because the proportions of the different plastic polymers in the mixed plastics stream varies month by month, so too does the recovery rate of this material stream. Typically, it will vary between 75 – 90% and is the most variable kerbside material stream in terms of quality and recyclability.

Garden Waste

Our garden waste is currently taken to the Bryn Posteg composting facility near Llanidloes. Here it is shredded prior to undergoing 'open windrow' composting. This process involves mixing the shredded material and storing it in large open-air bays. The material is turned periodically to aerate it and allow full breakdown throughout the load, and the process can take several months (typically around 16 weeks) to produce the final compost output. Once complete, the compost material is used as a soil conditioner when covering closed cells of the adjacent landfill site to return it to good quality pasture land.

Residual Waste

Our residual waste is currently taken to Bryn Posteg landfill site near Llanidloes. Here it undergoes a Mechanical Biological Treatment (MBT) process involving shredding and drying of the waste prior to being baled and landfilled (at time of writing, permitting issues mean the treated waste is actually landfilled at alternative sites in Wales and England). This allows the waste to enter the landfill cells in as stable a state as possible to prevent land subsidence once the landfill cells are closed and capped. The drying also helps to reduce the amount of methane produced through the breakdown of landfilled material in the sealed cells where there is an absence of oxygen. However, any methane that does escape is captured and utilised as biogas.

Destinations of Kerbside Collected Recycling & Refuse (as of June 2019)

Processing	Food	Paper & Card	Cans & Plastics		Glass			Garden waste	Residual
Primary Processing	*Anaerobic Digestion (AD) Plant: Bridgend.* AD process produces: - Methane, used as biogas for electricity for National Grid (NG) - Slurry, processed into agricultural fertiliser - Mechanical separation of reject material (large bones, plastic packaging etc.)	*Sorting Facility: Deeside, Flintshire* Separation of paper from cardboard	*Transfer Station: Brecon* Separation of steel and aluminium cans from plastics before baling all material for onward haulage		*Glass reprocessor: Cwmbran, Torfaen; Ellesmere Port, Cheshire* - Magnetic and eddy current separation of metals from glass - Wet process to float paper and plastics 'reject' from glass - Classifying of glass into grades by grain size - Poorest quality 'fines' fraction of glass graded into 'eco-sand' product for sale as aggregate			*Composting Facility: Llanidloes* Material shredded and composted in open windrows. Final compost material used as soil conditioner when restoring land surface above closed landfill cells back to pasture land	*MBT Plant: Llanidloes* Material udergoes 'Mechanical Biological Treatment', including shredding and drying. Reduces overall mass of material buried, and stabilises it to prevent subsidence in closed and capped landfill cells.
Secondary Processing	*Incinerator: Typically Cardiff / Bristol.* - Reject incinerated for electricity for NG - Incineration produces ash	*Paper Mills: Manchester (Cardboard); Kings Lynn, Norfolk (Paper)* - Separation of reject (packaging tape, staples etc.) - Paper/card pulped and recycled - On-site incineration of non-metal reject for electricity to power plant operations	*Material Recovery facility (MRF): South Normanton, Derbyshire (Plastics)* - Separation of reject material (fines, paper, non-recyclable plastics etc.) - Optical sorting of plastics into individual polymer streams	*Metal Reprocessor: Port Talbot (Steel Cans); Warrington, Cheshire (Aluminium Cans)* Recycled into new cans, car parts and other recycled products	*Glass reprocessor: Cwmbran, Torfaen* *Best grades of glass are used to produce fibreglass insulation for domestic market*	*Metal Reprocessor: Various* - Magnetic and eddy current separation of metals into ferrous and non-ferrous. - Shredding of metals ready for smelting in furnace	*Incinerator: Various* - Reject incinerated for electricity for NG - Incineration produces ash		*Non-hazardous Landfill: Llanidloes* - Material added to landfill cells for burying and final disposal. - Once cell is capped, methane gas produced by anaerobic digestion within cell is captured and utilised as biogas
Tertiary Processing	*Cement Manufacturer: Various, South West* Ashes typically used as replacement for raw material in cement manufacture.	*Metal Reprocessor: Various, North of England and East Anglia* - Separation of metals into ferrous and non-ferrous. - Metals recycled into new products	*Plastics Reprocessors: Various* - Pelletising of plastic polymers - Recycling into new plastic products: bottles, pots, tubs, trays	*Incinerator: Various* - Reject (PVC) landfilled as chlorine means it cannot be incinerated. - Reject (non-recyclable material) incinerated in UK & Europe for electricity			*Cement Manufacturer: North of England and South Wales* Ashes used as replacement for raw material in cement manufacture		