CLAIMS

What is claimed is –

1. A method of recycling a plastic waste comprising:

(a) feeding a quantity of PET and metal-containing reclaimer co-product separated from said plastic waste to a chemical recycling facility; and

(b) depolymerizing in said chemical recycling facility at least a portion of said quantity of PET and metal-containing reclaimer co-product,

the method further comprising:

separating at least a portion of the plastic material in said co-product from said metals before said depolymerizing (b);

wherein said separating comprises:

feeding at least a portion of said quantity of PET and metal-containing reclaimer co-product into at least one density separation stage to separate said portion of plastic materials from said metals.

2. A method of recycling a plastic waste comprising:

(a) feeding a quantity of PET and metal-containing reclaimer co-product separated from said plastic waste to a chemical recycling facility, said quantity of metal-containing co-product comprising plastic flakes and at least 0.1 weight percent metals; and

(b) depolymerizing in said chemical recycling facility at least a portion of said plastic flakes,

the method further comprising:

separating at least a portion of said plastic flakes from said metals before said depolymerizing (b);

wherein said separating comprises:

feeding at least a portion of said quantity of PET and metal-containing reclaimer co-product into at least one density separation stage to separate said portion of plastic flakes from said metals.

3. A method of recycling a plastic waste comprising:

(a) feeding a quantity of PET and metal-containing reclaimer co-product separated from said plastic waste to a chemical recycling facility, said quantity of metal-containing co-product comprising plastic articles and/or plastic particulate solids and at least 0.1 weight percent metals; and

(b) depolymerizing in said chemical recycling facility at least a portion of said plastic articles and/or plastic particulate solids,

the method further comprising:

separating at least a portion of said plastic articles and/or said plastic particulate solids from said metals before said depolymerizing (b);

wherein said separating comprises:

feeding at least a portion of said plastic articles and/or plastic particulate solids and said metals into at least one density separation stage to separate said portion of said plastic articles and/or said plastic particulate solids from said metals.

4. The method of claim 3, wherein said plastic articles are in the form of compressed bales.

5. The method of claim 4, further comprising processing at least a portion of said compressed bales to thereby produce a debaled quantity of plastic articles and said metals.

6. The method of claim 5, wherein said processing comprises reducing the size of said bales to form a quantity of plastic particulate solids having a D90 particle size of less than 2.54 cm (1 inch).

7. The method of any one of claims 1 to 6, wherein said co-product does not undergo separation prior to said feeding to said chemical recycling facility (a).

8. The method of claim 7, wherein said co-product undergoes separation within said chemical recycling facility.

9. The method of any one of claims 1 to 8, further comprising feeding at least a portion of said metals separated from said plastic material, said plastic flake, said plastic articles, and/or said plastic particulate solids into a partial oxidation (POX) gasifier.

10. A method of recycling a plastic waste comprising:

(a) feeding a quantity of PET and metal-containing reclaimer co-product separated from said plastic waste to a chemical recycling facility, said quantity of metal-containing reclaimer co-product comprising plastic fines and at least 0.1 weight percent metals; and

(b) depolymerizing in said chemical recycling facility at least a portion of said plastic fines,

the method further comprising:

separating at least a portion of said plastic fines from said metals before said depolymerizing (b);

wherein said separating comprises:

feeding at least a portion of said quantity of PET and metal-containing reclaimer co-product into at least one density separation stage to separate said portion of plastic fines from said metals.

11. The method of claim 10, further comprising densifying at least a portion of said plastic fines to produce a quantity of densified PET-containing particles before said depolymerizing (b).

12. The method of claim 11, wherein said densified PET-containing particles have a D90 particle size of 1 to 10 mm.

13. The method of claim 11 or 12, wherein said densified PET-containing particles comprise at least a portion of said metals.

14. The method of any one of claims 10 to 13, wherein said co-product undergoes separation within said chemical recycling facility .

15. The method of any one of claims 10 to 14, further comprising separating and/or recovering at least a portion of said metals in said co-product in a metal-containing stream, and feeding said metal-containing stream to a pyrolysis facility within said chemical recycling facility.

16. The method of claim 15, wherein said metal-containing stream further comprises a quantity of plastic material.

17. The use of a PET and metal-containing reclaimer co-product as a feedstock to a chemical recycling facility, comprising the depolymerization of said PET, wherein prior to the depolymerization, said PET and metal-containing reclaimer co-product are fed into a density separation stage to separate said PET from said metal.