

CLAIMS

What is claimed is –

1. A method of recycling a plastic waste comprising:

- 5 (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.

2. A method of recycling a plastic waste comprising:

- 10 (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
15 said plastic flakes.

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
20 of metal-containing co-product comprising plastic articles and at least 0.1 weight percent metals; and
(b) depolymerizing in said chemical recycling facility at least a portion of said plastic articles.

25 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
30 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).

5 7. The method of any one of claims 1, 2, 3, or 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, further comprising:

10 (i) feeding at least a portion of said metals and at least a portion of said plastic material in said co-product to a solvolysis facility within said chemical recycling facility;

 (ii) feeding at least a portion of said metals and at least a portion of said plastic flakes in said co-product to a solvolysis facility within said chemical recycling facility; or

15 (iii) feeding at least a portion of said metals and at least a portion of said plastic articles in said co-product and/or said plastic particulate solids to a solvolysis facility within said chemical recycling facility.

20 9. The method of claim 8, wherein at least a portion of said metals are removed from said co-product and/or said plastic particulate solids by a solid/liquid separator and/or purge in said solvolysis facility.

10. The method of any one of claims 1, 2, 3, or 6, further comprising:

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

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

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

11. The method of claim 10, wherein said separating comprises:

(i) 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;

5 (ii) 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; or

10 (iii) feeding at least a portion of said plastic articles and/or said 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.

12. The method of claim 10, 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.

13. A method of recycling a plastic waste comprising:

20 (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.

25 14. The method of claim 13, further comprising densifying at least a portion of said plastic fines to produce a quantity of densified PET-containing particles before said depolymerizing (b).

30 15. The method of claim 14, wherein said densified PET-containing particles have a D90 particle size of 1 to 10 mm.

16. The method of claim 14, wherein said densified PET-containing particles comprise at least a portion of said metals.

5 17. The method of claim 14, further comprising feeding at least a portion of said densified PET-containing particles to a solvolysis facility within said chemical recycling facility without undergoing a preprocessing or separation process.

10 18. The method of any one of claims 13 to 17, 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.

15 19. The method of claim 18, wherein said metal-containing stream further comprises a quantity of plastic material.

20 20. The use of a PET and metal-containing reclaimer co-product as a feedstock to a chemical recycling facility.