

CLAIMS

What is claimed is –

1. A method of recycling a plastic waste comprising:

(a) feeding to a chemical recycling facility at least a portion of one or
5 more PET-containing materials comprising:

(i) PET-containing reclaimer co-products, and/or

(ii) PET-containing MRF products or co-products, and/or

(iii) sorted plastic-containing mixtures, and/or

(iv) PET-containing waste plastic from a plastic article
10 manufacturing facility,

wherein (i)-(ii) are separated from said plastic waste; and

(b) depolymerizing in said chemical recycling facility said at least a
portion of said PET-containing materials.

15 2. A method of recycling a plastic waste comprising:

(a) feeding to a solvolysis facility at least a portion of one or more PET-
containing materials comprising:

(i) PET-containing reclaimer co-products, and/or

(ii) PET-containing MRF products or co-products, and/or

20 (iii) sorted plastic-containing mixtures, and/or

(iv) PET-containing waste plastic from a plastic article
manufacturing facility,

wherein (i)-(ii) are separated from said plastic waste; and

(b) depolymerizing in said solvolysis facility at least a portion of said
25 PET-containing materials

3. The method of claims 1 or 2, wherein said at least a portion of said
PET-containing materials comprise at least two PET-containing reclaimer co-
products.

30 4. The method of claims 1 or 2, wherein:

(i) said at least a portion of said PET-containing materials comprises at least 10 weight percent PET on a dry basis;

(ii) said at least a portion of said PET-containing materials comprises not more than 10 weight percent halogens on a dry basis; and/or

5 (iii) said at least a portion of said PET-containing materials comprises not more than 90 weight percent polyolefins on a dry basis.

10 5. The method of claim 2, wherein said at least a portion of said PET-containing materials is fed directly into a dissolver within said solvolysis facility.

6. The method of claim 5, wherein said at least a portion of said PET-containing materials fed into said dissolver comprise less than 10 weight percent nylon, polycarbonate, crosslinking agents, carpet glue, high filler content materials, acetates, spandex, latex, styrene butadiene rubber, non-
15 reactive materials including non-reactive metal oxides (such as titanium dioxide, silicon dioxide, and alumina), calcium carbonate, talc, silica, glass, glass beads, reactive metal oxides, and/or materials that form azeotropes with water, methanol, and/or ethylene glycol.

20 7. The method of any one of claims 2, 5, or 6, wherein said at least a portion of said PET-containing materials is the only plastic-containing feed to said solvolysis facility.

25 8. The method of any one of claims 2, 5, or 6, wherein said at least a portion of said PET-containing materials comprise at least 5 weight percent of the feed to said solvolysis facility.

30 9. The method of any one of claims 2, 5, or 6, further comprising preprocessing said at least a portion of said PET-containing materials prior to feeding into said solvolysis facility.

10. The method of claim 9, wherein said preprocessing comprises any one or more of the following:

5 (i) separating at least a portion of the PET content of said at least a portion of said PET-containing materials using one or more density separation processes; and/or

(ii) drying said at least a portion of said one or more PET-containing materials; and/or

10 (iii) densifying said at least a portion of said one or more PET-containing materials.

11. The method of claim 1, wherein said plastic waste is provided to said chemical recycling facility directly from a reclaimer and/or municipal recycling facility using a conveyance system interconnecting said chemical recycling facility to said reclaimer and/or municipal recycling facility.

12. The method of any one of claims 2, 5, or 6, wherein said plastic waste is provided to said solvolysis facility directly from a reclaimer and/or municipal recycling facility using a conveyance system interconnecting said solvolysis facility to said reclaimer and/or municipal recycling facility.

13. A method of recycling a plastic waste comprising:
(a) feeding a quantity of PET-containing reclaimer wet fines separated from said plastic waste to a chemical recycling facility; and
25 (b) depolymerizing in said chemical recycling facility at least a portion of said PET-containing reclaimer wet fines.

14. The method of claim 13, wherein at least a portion of the plastic particles from said PET-containing reclaimer wet fines are densified to form a quantity of densified PET-containing particles having an average particle size
30 of 0.32 cm (1/8 inch) to 2.54 cm (1 inch) before said depolymerizing (b).

15. The method of claim 14, wherein said quantity of densified PET-containing particles is liquified to form a liquified plastic material before said depolymerizing (b).

5 16. The method of any one of claims 13 to 15, wherein:

(i) said quantity of PET-containing reclaimer wet fines comprises at least 90 weight percent PET on a dry basis;

(ii) said quantity of PET-containing reclaimer wet fines comprise not more than 10 weight percent halogens on a dry basis; and/or

10 (iii) said quantity of PET-containing reclaimer wet fines comprise not more than 50 weight percent polyolefins on a dry basis.

17. The method of any one of claims 13 to 15, wherein at least 40 weight percent of the water content from said quantity of PET-containing reclaimer wet fines is removed before said depolymerizing (b).

18. The method of any one of claims 13 to 15, wherein said quantity of PET-containing reclaimer wet fines are fed to a solvolysis facility within said chemical recycling facility wherein said depolymerizing (b) occurs.

20 19. The use of one or more PET-containing materials as a feedstock to a chemical recycling facility and/or solvolysis facility, said one or more PET-containing materials comprising:

(i) PET-containing reclaimer co-products, and/or

25 (ii) PET-containing MRF products or co-products, and/or

(iii) sorted plastic-containing mixtures, and/or

(iv) PET-containing waste plastic from a plastic article manufacturing facility.

30 20. The use of PET-containing reclaimer wet fines as a feedstock to a chemical recycling facility.