CLAIMS

What is claimed is:

1. A method for processing waste plastic, said method comprising:

introducing a polyolefin (PO)-containing waste plastic stream, and a solvolysis coproduct stream obtained from a solvolysis facility, into at least one of (i) a partial oxidation (POX) gasification facility; (ii) a pyrolysis facility; and (iii) an energy generation/energy production facility,

further comprising combining said PO-containing stream and said solvolysis coproduct stream to form a combined stream, wherein said combined stream is introduced into at least one of (i) through (iii).

2. The method of claim 1, wherein said combining is performed in a continuous manner.

3. The method of claim 1, wherein said combined stream comprises at least 5 and not more than 99 weight percent of the PO-containing stream, and wherein the weight ratio of said PO-enriched stream to said solvolysis coproduct stream in said combined stream is at least 1:10 and not more than 10:1.

4. The method of claim 1, wherein said solvolysis coproduct stream comprises at least 50 weight percent of a heavy organic solvolysis coproduct, based on the total weight of the stream or wherein said solvolysis coproduct stream comprises at least 5 and not more than 60 weight percent of a light organic solvolysis coproduct, based on the total weight of the stream.

5. The method of claim 1, wherein said PO-containing stream and said solvolysis coproduct stream are introduced into said POX gasification facility, and wherein said POX gasification facility comprises a solid-fed gasifier.

6. The method of claim 1, wherein said PO-containing stream and said solvolysis coproduct stream are introduced into said pyrolysis facility and further comprising pyrolyzing said PO-containing stream and said solvolysis coproduct stream in said pyrolysis facility to form a recycle content pyrolysis gas (r-pyrolysis gas) and/or a recycle content pyrolysis oil (r-pyoil) composition.

7. The method of claim 1, wherein said PO-containing stream and said solvolysis coproduct stream are introduced into at least two of (i) through (iii).

8. The method of claim 1, wherein said solvolysis coproduct stream is a methanolysis coproduct stream.

9. A method for processing waste plastic, said method comprising:

(a) introducing a polyethylene terephthalate (PET)-containing waste plastic stream into a solvolysis facility to thereby produce at least a principal terephthalyl stream, a principal glycol stream, and at least one solvolysis coproduct stream; and

(b) introducing a polyolefin (PO)-containing waste plastic stream and at least a portion of said solvolysis coproduct stream into at least one of (i) a partial oxidation (POX) gasification facility; (ii) a pyrolysis facility; and (iii) an energy generation/energy production facility,

further comprising combining said PO-containing stream and said solvolysis coproduct stream to form a combined stream, wherein said combined stream is introduced into at least one of (i) through (iii).

10. The method of claim 9, wherein said solvolysis coproduct stream comprises organic compounds and wherein at least 35 weight percent of said organic compounds have a boiling point higher than the boiling point of the principal glycol produced from said solvolysis facility and/or wherein said solvolysis coproduct stream comprises organic compounds and at least about 15 weight percent of said organic compounds have a

boiling point higher than the boiling point of the principal glycol and lower than the boiling point of said principal terephthalyl produced from said solvolysis facility.

11. The method of claim 9, wherein at least a portion of said solvolysis coproduct stream has been withdrawn from one or more of the following items of equipment in said solvolysis facility: a solvolysis reaction zone, a non-PET separation zone, a solvent separation zone, a glycol separation zone, and/or a terephthalyl separation zone.

12. The method of claim 9, wherein said introducing of step (b) includes introducing said PO-containing waste plastic stream and said solvolysis coproduct stream into at least two of facilities (i) to (iii).

13. The method of claim 9, wherein said PO-containing waste plastic stream and said solvolysis coproduct stream are introduced into different ones of facilities (i) to (iii).

14. The method of claim 9, wherein said solvolysis facility is co-located with the at least one of the other facilities (i) through (iii), and wherein at least one of the following statements (i) through (vi) are true –

(i) the solvolysis facility and the other facility share at least one utility;

(ii) the solvolysis facility and the other facility share at least one service group;

(iii) the solvolysis facility and the other facility are owned and/or operated by parties that share at least one boundary;

(iv) the solvolysis facility and the other facility are connected by at least one conduit;

(v) the solvolysis facility and the other facility share energy via an energy exchange zone; and

(vi) the solvolysis facility and the other facility are within 50 miles from one another, measured from their geographical center.

15. A method for processing waste plastic, said method comprising:

(a) separating a stream of mixed plastic waste (MPW) into a polyethylene terephthalate-enriched (PET-enriched) stream and a polyolefin-enriched (PO-enriched) stream;

(b) introducing at least a portion of said PET-enriched stream into a solvolysis facility to thereby produce at least a principal terephthalyl stream, a principal glycol stream, and at least one solvolysis coproduct stream; and

(c) introducing at least a portion of said PO-enriched stream and at least a portion of said solvolysis coproduct stream into at least one of (i) a partial oxidation (POX) gasification facility; (ii) a pyrolysis facility; and (iii) an energy generation/energy production facility,

further comprising combining said PO-enriched stream and said solvolysis coproduct stream to form a combined stream, wherein said combined stream is introduced into at least one of (i) through (iii).

16. The method of claim 15, wherein said MPW comprises textiles in an amount of at least 0.1 weight percent and at least 5 and not more than 95 weight percent of plastics not classified as plastics #3 to #7, based on the total weight of the stream, wherein said PET-enriched stream comprises at least 60 weight percent PET and not more than 40 weight percent polyolefins and said PET-enriched stream comprises not more than 10 weight percent halogens, based on the total weight of said PET-enriched stream, and wherein said PO-enriched stream comprises at least 60 weight percent PO and not more than 40 weight percent PET, based on the total weight of said PO-enriched stream.

17. The method of claim 15, wherein said solvolysis facility is a methanolysis facility.

18. The method of claim 15, wherein said method is carried out as a continuous process and in a commercial-scale facility.