CLAIMS

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

(a) subjecting at least a portion of a polyethylene terephthalate-enriched (PET-enriched) stream to solvolysis in a solvolysis facility to form a principal glycol product, a principal terephthalyl product, and at least one solvolysis coproduct stream; and

(b) introducing a solvolysis coproduct stream from a solvolysis facility into at least one of the following: (i) a partial oxidation (POX) gasification facility; (ii) a pyrolysis facility; and (iii) an energy generation/energy production facility,

wherein the PET-enriched stream is obtained from separating a stream of mixed plastic waste (MPW) into a PET-enriched stream and a polyolefin-enriched stream (PO-enriched) stream.

2. The method of claim 1, wherein said introducing includes introducing said solvolysis coproduct stream from said solvolysis facility into said POX gasification facility and further comprising converting at least a portion of said solvolysis coproduct stream to syngas in said POX gasification facility.

3. The method of claim 1, wherein said solvolysis coproduct stream comprises at least 40 weight percent of organic compounds and wherein at least one of the following criteria (i) through (iv) is met –

(i) at least about 35 weight percent of said organic compounds have a boiling point higher than the boiling point of said principal glycol produced from said solvolysis facility, based on the total weight of organics in said solvolysis coproduct stream;

(ii) at least about 15 weight percent of said organic compounds have a boiling point higher than the boiling point of said principal glycol and lower than the boiling point of said principal terephthalyl produced from said solvolysis facility, based on the total weight of organics in said coproduct stream;

(iii) at least about 15 weight percent of said organic compounds have a boiling point higher than the boiling point of said principal terephthalyl produced from said solvolysis facility, based on the total weight of organics in said coproduct stream; and

(iv) at least 5 and not more than 50 weight percent of said organic compounds have a boiling point lower than the boiling point of said principal glycol produced from said solvolysis facility, based on the total weight of organics in said coproduct stream.

4. The method of claim 1, further comprising combining said solvolysis coproduct stream with another stream to form a combined stream, wherein said combined stream is introduced into at least one of (i) through (iii).

5. The method of claim 1, further comprising introducing another solvolysis coproduct stream from said solvolysis facility into at least one of the following: (i) a partial oxidation (POX) facility; (ii) a pyrolysis facility; (iii) a solidification facility; and (iv) an energy generation/energy production facility, wherein said solvolysis coproduct stream and said another solvolysis coproduct stream are introduced into different ones of (i) through (iv).

6. The method of claim 1, wherein said coproduct stream comprises a polyolefin-containing coproduct stream.

7. The method of claim 6, further comprising introducing at least a portion of said polyolefin-containing coproduct stream into a cracking facility.

8. The method of claim 1, further comprising withdrawing said solvolysis coproduct stream from said solvolysis facility, wherein at least a portion of said solvolysis coproduct stream is 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 a terephthalyl separation zone

9. The method of claim 1, wherein said solvolysis facility is a methanolysis facility and said solvolysis coproduct stream is a methanolysis coproduct stream.

10. The method of claim 1, wherein said solvolysis facility is a commercial-scale facility.

11. 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 stream (PO-enriched) stream;

(b) subjecting at least a portion of said PET-enriched stream to solvolysis in a solvolysis facility to form a principal glycol product, a principal terephthalyl product, and at least one solvolysis coproduct stream; and

(c) introducing at least a portion of said at least one solvolysis coproduct stream from said solvolysis facility into at least one of the following: (i) a partial oxidation (POX) gasification facility; (ii) a pyrolysis facility; (iii) a solidification facility; and (iv) an energy generation/energy production facility.

12. The method of claim 11, wherein said coproduct stream comprises a polyolefin-containing coproduct stream and the method further comprising introducing at least a portion of said coproduct stream into a cracking facility.

13. The method of claim 11, wherein said PET-enriched stream comprises at least 50 weight percent PET and not more than 40 weight percent of polyolefins, based on the total weight of the stream, wherein said PO-enriched stream comprises at least 50 weight percent polyolefins and not more than 40 weight percent of PET, based on the total weight of the stream, and wherein said PET-enriched stream comprises not more than 10 weight percent of halogens, based on the total weight of the stream.

14. The method of claim 11, wherein said introducing of step (c) includes at least one of the following steps (i) through (iii) –

(i) heating at least a portion of said solvolysis coproduct stream to form a melt and introducing at least a portion of said melt into at least one of (i) through (iv);

(ii) pastillizing, flaking, or pelletizing at least a portion of said solvolysis coproduct stream to form solids and introducing at least a portion of said solids into one of (i) through (iv); and

(iii) combining at least a portion of said solids with a liquid to form a slurry and introducing said slurry into one of (i) through (iv).

15. The method of claim 11, wherein said solvolysis is methanolysis and said solvolysis facility is a methanolysis facility.

16. The method of claim 11, wherein said solvolysis facility is a commercial-scale facility.