What is claimed is:

1. A continuous process for converting waste plastic into recycle for polyethylene polymerization comprising:

(a) selecting waste plastics comprising polyethylene and/or polypropylene;

(b) preparing a blend of petroleum and the selected waste plastic with the blend comprising about 20 wt. % or less of the selected waste plastic;

(c) passing the blend at a temperature above the melting point of the waste plastic in the blend to a refinery FCC unit;

(d) recovering a liquid petroleum gas C_3 olefin/paraffin mixture from the FCC unit; and

(e) passing the C_3 mixture to a steam cracker to make ethylene.

2. The process of claim 1, wherein a gasoline and heavy fraction is recovered from the refinery FCC unit.

3. The process of claim 1, wherein the blend of (b) is a hot homogeneous blend of waste plastic and petroleum oil.

4. The process of claim 1, wherein the blend of (b) is a stable blend of waste plastic and petroleum oil prepared by heating the waste plastic above the melting point of the plastic and mixing with the petroleum, and then cooling the blend to a temperature below the melting point of the waste plastic.

5. The process of claim 1, wherein the waste plastics selected in (a) comprise plastics from classification group 2, 4, and/or 5.

6. The process of claim 1, wherein a C_4 stream and a heavy fraction are recovered from a FCC unit distillation column and further processed in the refinery to clean gasoline, diesel, or jet fuel.

7. The process of claim 1, wherein the volume flow of the blend to the refinery FCC unit in (c) comprises up to 50 vol. % of the total hydrocarbon flow to the FCC unit.

8. The process of claim 7, wherein the blend flow comprises up to 25 vol. % of the total flow to the FCC unit.

9. The process of claim 1, wherein the petroleum in the blend comprises atmospheric gas oil, vacuum gas oil (VGO), atmospheric residue, a petroleum derived oil, a petroleum based material, heavy stock recovered from refinery operations, light cycle oil (LCO), heavy cycle oil (HCO), FCC naphtha, gasoline, diesel, toluene, and/or aromatic solvent derived from petroleum.

10. A continuous process for converting waste plastic into recycle for polyethylene polymerization comprising:

(a) selecting waste plastics containing polyethylene and/or polypropylene;

(b) preparing a blend of petroleum and the selected plastic, with the blend comprising about 20 wt. % or less of the selected plastic;

(c) passing the blend to a refinery FCC unit;

(d) recovering a liquid petroleum gas C_3 olefin/paraffin mixture from the FCC unit;

(e) passing the C_3 olefin/paraffin mixture to a steam cracker to make ethylene;

(f) recovering C_4 paraffin and naphtha from the FCC unit; and

(g) passing the C_4 paraffin and naphtha recovered from the FCC unit to the steam cracker to make ethylene.

11. The process of claim 10, wherein a gasoline and heavy fraction is recovered from the refinery FCC unit.

12. The process of claim 10, wherein the blend of (b) is a hot homogeneous blend of waste plastic and petroleum oil.

13. The process of claim 10, wherein the blend of (b) is a stable blend of waste plastic and petroleum oil prepared by heating the waste plastic above the melting point of the plastic and mixing with the petroleum, and then cooling the blend to a temperature below the melting point of the waste plastic.

14. The process of claim 10, wherein the waste plastics selected in (a) comprise plastics from classification group 2, 4, and/or 5.

15. The process of claim 10, wherein a C_4 and a heavy fraction are recovered from a FCC unit distillation column and further processed in the refinery to clean gasoline, diesel, or jet fuel.

16. The process of claim 10, wherein the volume flow of the blend to the refinery FCC unit in (c) comprises up to 50 vol. % of the total hydrocarbon flow to the FCC unit.

17. The process of claim 16, wherein the blend flow comprises up to 25 vol. % of the total flow to the FCC unit.

18. The process of claim 10, wherein the petroleum in the blend comprises atmospheric gas oil, vacuum gas oil (VGO), atmospheric residue, a petroleum derived oil, a petroleum based material, heavy stock recovered from refinery operations, light cycle oil (LCO), heavy cycle oil (HCO), FCC naphtha, gasoline, diesel, toluene, and/or aromatic solvent derived from petroleum.

19. A continuous process for converting waste plastic into recycle for polyethylene polymerization comprising:

(a) selecting waste plastics comprising polyethylene and/or polypropylene;

(b) preparing a blend of petroleum and the selected waste plastic with the blend comprising about 20 wt. % or less of the selected waste plastic;

(c) passing the blend at a temperature above the melting point of the plastic in the blend to a feed pretreater unit for a refinery FCC unit;

(d) recovering a heavy fraction from the feed pretreater unit and passing the heavy fraction to refinery FCC unit;

(e) recovering a liquid petroleum gas C_3 olefin/paraffin mixture from the FCC unit; and

(f) passing the C_3 mixture to a steam cracker to make ethylene.

20. A process for converting waste plastic into recycle for preparation of lower carbon footprint fuels including gasoline, jet fuel, diesel and/or marine oil, comprising:

(a) selecting waste plastics containing polyethylene and/or polypropylene;

(b) preparing a blend of petroleum and the selected plastic, with the blend comprising about 20 wt. % or less of the selected plastic; and

(c) passing the blend to a refinery FCC unit.