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 hydrocracking unit;

(d) recovering a liquid petroleum gas C_3-C_4 olefin/paraffin mixture from the hydrocracking unit; and

(e) passing the C_3-C_4 mixture to a steam cracker to make ethylene.

2. The process of claim 1, wherein a naphtha stream is also recovered from the hydrocracking unit, and at least a portion is passed to the steam cracker as feed to make ethylene.

3. The process of claim 1, wherein the blend of (b) is a hot homogeneous 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.

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

5. The process of claim 1, wherein the ethylene is polymerized to polyethylene.

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

7. The process of claim 1, wherein a gasoline is recovered from the refinery hydrocracking unit and is sent to a gasoline blending pool.

8. The process of claim 2, wherein a portion of the naphtha stream recovered from the hydrocracking unit is further processed in the refinery to clean gasoline, diesel, or jet fuel.

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

10. The process of claim 9, wherein the blend flow comprises up to 25 vol. % of the total flow to the hydrocracking unit.

11. 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 .

12. The process of claim 1, wherein a heavy fraction is recovered from the hydrocracking unit and passed to an isomerization/dewaxing unit.

13. The process of claim 12, wherein a base oil is recovered from the isomerization/dewaxing unit.

14. The process of claim 13, where the recovered base oil is passed to a hydrofinishing unit.

15. The process of claim 12, wherein a naphtha fraction is recovered from the isomerization/dewaxing unit, and at least a portion of the naphtha fraction is passed to the steam cracker to make ethylene.

16. A process for converting waste plastic into chemicals useful in preparing polyethylene, 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 hydrocracking unit.

17. A continuous process for converting waste plastic into recycle for preparation of base oil 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 refinery hydrocracking unit;

(d) recovering a heavy fraction from the hydrocracking unit and passing the heavy fraction to a refinery isomerization/dewaxing unit; and

(e) recovering base oil from the isomerization dewaxing unit.

18. The process of claim 17, wherein the base oil recovered in (e) is passed to a hydrofinishing unit, from which is recovered a hydrofinished base oil.

19. A continuous process for converting waste plastic into recycle for preparation of lower carbon footprint fuels and base oil 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 refinery hydrocracking unit;

(d) recovering a heavy fraction from the hydrocracking unit and passing the heavy fraction to a refinery isomerization/dewaxing unit; and

(e) recovering base oil from the isomerization dewaxing unit.

20. The process of claim 19, wherein the lower carbon footprint fuels includes gasoline, jet fuel, diesel, and/or marine oil.