What is claimed is:

1. A blend of a petroleum atmospheric tower bottoms (ATBs) feedstock and 1-20 wt. % of plastic, based on the weight of the blend, with the plastic comprising polyethylene and/or polypropylene, and the plastic in the blend comprising finely dispersed micron-size particles having an average particle size of 10 micron to less than 100 microns.

2. The blend of claim 1, wherein the amount of plastic in the blend comprises from 1 to less than 20 wt. % of the blend.

3. The blend of claim 1, wherein the plastic comprises:

(a) low density polyethylene or high density polyethylene, optionally wherein the blend comprises from 1 – 10 wt.% of the high density polyethylene; or

(b) polypropylene having an average molecular weight, M_w, in the range of 5,000 to 150,000 or 150,000 to 400,000, optionally, wherein the blend comprises from 1-10 wt. % of the polypropylene; or

(c) wherein the plastic comprises a mixture of polyethylene and polypropylene.

4. The blend of claim 1, wherein the plastic is a waste plastic mixture comprising polyethylene and polypropylene.

5. The blend of claim 1, wherein the finely dispersed particles have an average particle size in the range of 10-50 microns or in the range of 10 to less than 100 microns.

6. The blend of claim 1, wherein the blend further comprises vacuum gas oil.

7. The blend of claim 1, wherein the blend is at a temperature above the melting point of the plastic and is a hot, homogenous liquid blend.

8. A process for preparing the blend of plastic and petroleum of claim 1, comprising:

(a) mixing a petroleum ATBs feedstock and a plastic comprising polyethylene and/or polypropylene together and heating the mixture above the melting point of the plastic, but less than 500° F, while mixing; and

(b) cooling the plastic melt and petroleum feedstock liquid blend to a temperature below the melting point of the plastic.

9. The process of claim 8, wherein the cooling in (b) is conducted together with continuous stirring optionally, wherein the cooling is continued until ambient temperature is reached; or wherein the heating is conducted at a temperature of 250-450° F with a residence time of 5-240 minutes at a final heating temperature.

10. The process of claim 8, wherein the plastic is a waste plastic mixture comprises polyethylene and polypropylene.

11. A process for converting waste plastic into recycle for polyethylene polymerization by using the blend of claim 1, comprising:

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

(b) preparing a blend of a ATBs feedstock 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 FCC unit;

(d) recovering a C3 olefin/paraffin mixture from the FCC unit; and

(e) passing the C3 mixture to a steam cracker to make ethylene.

12. A process for converting waste plastic into recycle for polypropylene polymerization by using the blend of claim 1, comprising:

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

(b) preparing a blend of a ATBs feedstock 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 to a FCC unit;

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

(e) separating the C_3 paraffin and C_3 olefin into different fractions; and

(f) passing the C_3 olefin to a propylene polymerization reactor.

13. The process of claim 12, wherein the volume flow of the blend to the FCC unit in (c) comprises up to 100 vol. % or up to 50 vol% of the total hydrocarbon flow to the FCC unit.

14. A continuous process for converting waste plastic into aromatics and chemical monomers by using the blend of claim 1, comprising:

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

(b) preparing a blend of a ATBs feedstock 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 FCC unit;

(d) recovering a naphtha mixture from the FCC unit; and

(e) passing the naphtha mixture to an aromatics separation unit.

15. The process of claim 14, wherein benzene, toluene, xylenes, ethylbenzene, or a mixture thereof is recovered from the aromatics separation unit.