CLAIMS

1. A method for processing a feedstock oil, the method comprising:

hydrotreating the feedstock oil to reduce or remove one or more of sulfur content, metals content, nitrogen content, or aromatics content to produce a hydrotreated oil stream;

separating at least a portion of the hydrotreated oil stream into a at least a lesser boiling point oil fraction stream and a greater boiling point oil fraction stream in a first separator;

hydrocracking the greater boiling point oil fraction stream; and

steam cracking the lesser boiling point oil fraction stream.

2. The method of claim 1, wherein the feedstock oil is crude oil.

3. The method of claims 1 or 2, further comprising separating the hydrotreated oil stream into at least a liquid hydrotreated oil stream and a gas hydrotreated oil stream, wherein the liquid hydrotreated oil stream is separated into the lesser boiling point oil fraction stream and the greater boiling point oil fraction stream.

4. The method of claim 3, wherein:

the gas hydrotreated oil stream is processed in a gas plant to form a gas plant effluent stream; or

the gas plant effluent stream is steam cracked; or

both.

5. The method of any of claims 1─4, wherein a hydrocracked effluent stream is formed by the hydrocracking of the greater boiling point oil fraction stream, and wherein the hydrocracked effluent stream is recycled.

6. The method of any of claims 1─5, wherein the steam cracking of at least the lesser boiling point oil fraction forms a steam-cracked effluent stream comprising

one or more of pyrolysis oil, gasoline, mixed butenes, hydrogen, methane, butane, butene, propane, propene, ethylene, ethane, benzene, toluene, or xylene.

7. The method of any of claims 1─6, wherein the steam cracking of at least the lesser boiling point oil fraction forms a steam-cracked effluent stream, and wherein the steam-cracked effluent stream is separated into one or more system product streams and a pyrolysis oil recycle stream.

8. A method for processing a feedstock oil, the method comprising:

hydrotreating the feedstock oil to reduce or remove one or more of sulfur content, metals content, nitrogen content, or aromatics content to produce a hydrotreated oil stream;

separating the hydrotreated oil stream into at least a liquid hydrotreated oil stream and a gas hydrotreated oil stream in a first separator;

separating the liquid hydrotreated oil stream into at least a lesser boiling point oil fraction stream and a greater boiling point oil fraction stream in a second separator;

hydrocracking the greater boiling point oil fraction stream to from a hydrocracked effluent stream;

passing the hydrocracked effluent stream to the first separator; and

steam cracking the lesser boiling point oil fraction stream.

9. The method of claim 8, wherein:

the gas hydrotreated oil stream is processed in a gas plant to form a gas plant effluent stream; or

the gas plant effluent stream is steam cracked; or

both.

10. The method of claims 8 or 9, wherein the steam cracking of at least the lesser boiling point oil fraction forms a steam-cracked effluent stream comprising one or more of pyrolysis oil, gasoline, mixed butenes, hydrogen, methane, butane, butene, propane, propene, ethylene, ethane, benzene, toluene, or xylene.

11. The method of any of claims 8─10, wherein the steam cracking of at least the lesser boiling point oil fraction forms a steam-cracked effluent stream, and wherein the steam-cracked effluent stream is separated into one or more system product streams and a pyrolysis oil recycle stream.

12. The method of any of claims 8─11, wherein the feedstock oil is crude oil.

13. A method for processing a feedstock oil, the method comprising:

hydrotreating the feedstock oil to reduce or remove one or more of sulfur content, metals content, nitrogen content, or aromatics content to produce a hydrotreated oil stream;

separating the hydrotreated oil stream into at least a liquid hydrotreated oil stream and a gas hydrotreated oil stream in a first separator;

separating the liquid hydrotreated oil stream into at least a lesser boiling point oil fraction stream and a greater boiling point oil fraction stream in a second separator;

hydrocracking the greater boiling point oil fraction stream to from a hydrocracked effluent stream;

separating the hydrocracked effluent stream into at least a gas hydrocracked recycle stream and a liquid hydrocracked recycle stream; and

steam cracking the liquid hydrocracked recycle stream.

14. The method of claim 13, further comprising:

combining the gas hydrocracked recycle stream with the gas hydrotreated oil stream; or

combining the liquid hydrocracked recycle stream with the lesser boiling point oil fraction stream; or

both.