CLAIMS

1. A process for producing green coke and fuel grade coke from residual oil comprising:

introducing the residual oil and a first paraffinic solvent having a carbon number C_n to a first solvent deasphalting unit to produce a high quality deasphalted oil (HQDAO) fraction and a first asphalt fraction, wherein n is from 3 to 7;

passing the HQDAO fraction to a delayed coker to produce green coke;

passing at least a portion of the first asphalt fraction and a second paraffinic solvent having a carbon number of 4 to 8 to a second solvent deasphalting unit to produce a low quality deasphalted oil (LQDAO) fraction and a second asphalt fraction, wherein the carbon number of the second paraffinic solvent is in accordance with at least C_{n+1}; and

passing the LQDAO fraction to the delayed coker to produce the fuel grade coke.

2. The process of claim 1, wherein the HQDAO fraction is passed to the delayed coker and produces green coke during a first period, and the LQDAO fraction is passed to the delayed coker and produce fuel grade coke during a second period, wherein the first period occurs before the second period, or the first period occurs after the second period.

3. The process of claim 1, wherein the HQDAO fraction and the LQDAO fraction is passed to the delayed coker simultaneously.

4. The process of any preceding claim further comprising calcining the green coke to produce anode coke, needle coke, or combinations thereof.

5. The process of any preceding claim further comprising subjecting the second asphalt fraction to further asphalt utilization and conversion steps.

6. The process of any preceding claim further comprising subjecting the first asphalt fraction to further asphalt utilization and conversion steps.

7. The process of any preceding claim where the delayed coker comprises dual delayed coking drums.

8. The process of any preceding claim, further comprising passing the HQDAO fraction to an adsorption column prior to passing the HQDAO fraction to the delayed coker, preferably where the adsorption column is a packed column.

9. The process of claim 8, where the adsorption column includes two columns.

10. The process of any preceding claim, further comprising

passing the HQDAO fraction to a first hydrotreater prior to passing the HQDAO fraction to the delayed coker, and/or

passing the LQDAO fraction to a second hydrotreater prior to passing the LQDAO fraction to the delayed coker.

11. The process of any preceding claim, where the first paraffinic solvent comprises propane and the second paraffinic solvent comprising pentane.

12. The process of any preceding claim, where the ratio of the first paraffinic solvent to the residual oil is from 2 to 20, and preferably where the ratio of the first paraffinic solvent to the residual oil is from 5 to 10.

13. A system for producing green coke and fuel grade coke from residual oil comprising:

a first solvent deasphalting unit configured to produce a high quality deasphalted oil (HQDAO) fraction and a first asphalt fraction from the residual oil and a first paraffinic solvent having a carbon number C_n, wherein n is from 3 to 7;

a second solvent deasphalting unit downstream of the first solvent deasphalting unit, the second solvent deasphalting unit being configured to produce a low quality deasphalted oil (LQDAO) fraction and a second asphalt fraction from the first asphalt fraction and a second paraffinic solvent having carbon number of 4 to 8, wherein the carbon number of the second paraffinic solvent is in accordance with at least C_{n+1}; and

a delayed coker in fluid communication with the first solvent deasphalting unit and the second solvent deasphalting unit, wherein the delayed coker is configured to produce green coke from the HQDAO fraction and is configured to produce fuel coke from the LQDAO fraction.

14. The system of claim 13 further comprising an adsorption column disposed downstream of the first solvent deasphalting unit and upstream of the delayed coker, preferably where the adsorption column comprises at least one packed column.

15. The system of claim 13 or 14 further comprising:

a first hydrotreater disposed downstream of the first solvent deasphalting unit and upstream of the delayed coker, and/or

a second hydrotreater disposed downstream of the second solvent deasphalting unit and upstream of the delayed coker.