CLAIMS

1. A marine fuel or fuel blending composition comprising: a blend of heavy residual fuel oil and one or more of: a) biodiesel distillation tower bottoms, and b) renewable diesel comprising at least 70% n-paraffins, wherein the marine fuel or fuel blending composition contains less than 3.5 wt.% sulfur.

2. The marine fuel or fuel blending composition according to claim 1, wherein the fuel or fuel blending composition further comprises a biodiesel.

3. The marine fuel or fuel blending composition according to claim 1, wherein the fuel or fuel blending composition comprises the biodiesel distillation tower bottoms, wherein the biodiesel distillation tower bottoms have a viscosity of greater than 6 cSt at 40°C, a pour point of 10°C or higher, and an ASTM color value of at least 3 according to ASTM D1500.

4. The marine fuel or fuel blending composition according to claim 3, wherein the biodiesel distillation tower bottoms are present in the fuel composition at a concentration of up to 30% by volume.

5. The marine fuel or fuel blending composition according to claim 3, wherein the marine fuel or fuel blending composition exhibits an increase in solubility number (S_{BN}) of at least 5 or at least 10 or at least 15 or at least 20 or at least 25 or at least 30 as compared with the solubility number of the heavy residual fuel oil and biodiesel distillation tower bottoms components separately.

6. The marine fuel or fuel blending composition according to claim 1, wherein the fuel or fuel blending composition comprises the renewable diesel, wherein the renewable diesel comprises up to 95% n-paraffins.

7. The marine fuel or fuel blending composition according to claim 3, wherein the renewable diesel is present in the fuel composition at a concentration of up to 30% by volume.

8. A method of using biodiesel distillation tower bottoms in a marine fuel composition, the biodiesel distillation tower bottoms have a viscosity of greater than 6 cSt at 40°C, a pour point of 10°C or higher, and an ASTM color value of 3 or more according to ASTM D1500, wherein the method comprises the step of blending biodiesel distillation tower bottoms with heavy residual fuel oil, wherein the biodiesel distillation tower bottoms are present in the marine fuel at a concentration of up to 30% by volume.

9. The method according to claim 8, wherein the marine fuel composition further comprises renewable diesel comprising at least 70% n-paraffins.

10. The method according to claim 8, wherein the marine fuel composition further comprises a biodiesel.

11. A method using renewable diesel comprising at least 70% n-paraffins in a marine fuel composition, wherein the method comprises the step of blending the renewable diesel comprising the majority of n-paraffins with heavy residual fuel oil or marine gasoil, wherein the renewable diesel is present in the marine fuel at a concentration of up to 30% by volume.

12. The method according to claim 11, wherein the marine fuel composition further comprises a biodiesel.

13. A method of improving solvency of a marine fuel or fuel blending composition, the method comprising the steps of: blending at least 1% by volume biodiesel distillation tower bottoms with heavy residual oil to produce the marine fuel or fuel blending composition, wherein the marine fuel or fuel blending composition exhibits improved solvency.

14. The method according to claim 13, wherein the marine fuel or fuel blending composition exhibits an increase in solubility number (S_{BN}) of at least 5 or at least 10 or at least 15 or at least 20 or at least 25 or at least 30 as compared with the solubility number of the heavy residual fuel oil and biodiesel distillation tower bottoms components separately.

15. The method according to claim 13, wherein the marine fuel or fuel blending composition comprises at least 5% by volume biodiesel distillation tower bottoms.

16. The method according to claim 15, wherein the marine fuel or fuel blending composition comprises at least 15% and up to 30% by volume biodiesel distillation tower bottoms.

17. A marine fuel or fuel blending composition comprising: a blend of heavy residual fuel oil and biodiesel distillation tower bottoms, wherein the composition comprises less than 3.5 wt.% sulfur, wherein the composition comprises 1.0 vol.% to 70 vol% of the biodiesel distillation tower bottoms.

18. The marine fuel or fuel blending composition of claim 17, wherein 20 wt% or more of the biodiesel distillation tower bottoms have a boiling point of 550°C or higher.

19. The marine fuel or fuel blending composition of claim 17, wherein the biodiesel distillation tower bottoms comprise an ash content of 0.2 wt% or more.

20. The marine fuel or fuel blending composition of claim 17, wherein the biodiesel distillation tower bottoms comprises i) a combined content of sodium and potassium of 50 wppm or more; ii) a combined content of calcium and magnesium of 50 wppm or more; iii) 50 wppm or more of phosphorus; iv) or a combination of two or more of i), ii), and iii).

21. The marine fuel or fuel blending composition of claim 17, wherein the composition comprises less than 5.0 wt% of fatty acid alkyl esters.

22. The marine fuel or fuel blending composition of claim 17, wherein the biodiesel distillation tower bottoms comprise 40 wt% or less of fatty acid alkyl esters.

23. The marine fuel or fuel blending composition of claim 22, wherein the composition comprises 10 vol% or less of biodiesel distillation tower bottoms.

24. The marine fuel or fuel blending composition of claim 17, wherein the composition comprises a sulfur content of 1.0 wt% or less, the composition comprising 90 wt% or more of a combined amount of the heavy residual fuel oil and biodiesel distillation tower bottoms, the heavy residual sulfur fuel oil comprising a sulfur content of 1.5 wt% or more.

25. The marine fuel or fuel blending composition of claim 17, wherein a fatty acid alkyl ester content of the composition is lower than a fatty acid alkyl ester content of the biodiesel distillation tower bottoms.