CLAIMS:

1. A distillate composition comprising:

at least about 50 wt% naphthenes;

less than about 1.5 wt% aromatics; and

about 10 wt% to about 50 wt% non-cyclic paraffins.

2. The distillate composition of claim 1, wherein the naphthenes are present in an amount of at least about 60 wt%.

3. The distillate composition of claim 1, wherein the about 10 wt% to about 50 wt% non-cyclic paraffins comprise about 10 wt% to about 50 wt% isoparaffins.

4. The distillate composition of claim 1, wherein single ring naphthenes are present in an amount of at least about 50% w/w relative to a total amount of naphthenes.

5. The distillate composition of claim 4, wherein a w/w ratio of the single ring naphthenes to the total naphthenes is about 2:5 to about 5:8.

6. The distillate composition of claim 1, wherein multi-ring naphthenes are present in an amount of at least about 50% w/w relative to a total amount of naphthenes.

7. The distillate composition of claim 6, wherein a w/w ratio of the multi-ring naphthenes to the total naphthenes is about 2:5 to about 5:8.

8. The distillate composition of claim 1, wherein single ring naphthenes and multi-ring naphthenes are present in a w/w ratio of about 2:3 to about 3:2.

9. The distillate composition of claim 6, wherein the multi-ring naphthenes are selected from the group consisting of two-ring naphthenes, three-ring naphthenes, four-ring naphthenes, five-ring naphthenes, six-ring naphthenes, and a combination thereof.

10. The distillate composition of claim 9, wherein single ring naphthenes and two-ring naphthenes are present in a collective amount of at least about 60% w/w relative to the total amount of naphthenes.

11. The distillate composition of claim 9, wherein four-ring naphthenes, five-ring naphthenes, and six-ring naphthenes are present in a collective amount of about 5.0% w/w to about 12% w/w relative to the total amount of naphthenes.

12. The distillate composition of claim 9, which satisfies one or more of the following:

(i) four-ring naphthenes are present in an amount of about 2.0% w/w to about 10% w/w relative to the total amount of naphthenes;

(ii) five-ring naphthenes are present in an amount of about 1.0% w/w to about 2.6% w/w relative to the total amount of naphthenes; and

(iii) six-ring naphthenes are present in an amount of about 0.20% w/w to about 1.0% w/w relative to the total amount of naphthenes.

13. The distillate composition of claim 12, wherein the distillate composition satisfies at least two of (i)-(iii).

14. The distillate composition of claim 12, wherein the distillate composition satisfies (i)-(iii).

15. The distillate composition of claim 1, wherein the composition comprises less than about 10 wt% of n-paraffins.

16. The distillate composition of claim 1, wherein n-paraffins are present in an amount of less than about 20% w/w relative to a total amount of non-cyclic paraffins in the distillate composition.

17. The distillate composition of claim 1, further comprising less than about 5 wppm sulfur.

18. The distillate composition of claim 1, which exhibits at least one of the following properties:

(i) a cetane number of at least about 50;

(ii) a cloud point of less than about -40°C;

(iii) a cold filter plugging point of less than about -20°C;

(iv) a smoke point of at least about 25 mm;

(v) a change in viscosity of greater than about 0.400 cSt between about 100°C and about 200°C; and

(vi) a volumetric energy content of at least about 131,000 BTU/gallon.

19. The distillate composition of claim 18, which exhibits at least two of properties (i)-(vi).

20. The distillate composition of claim 18, which exhibits at least three of properties (i)-(vi).

21. The distillate composition of claim 18, which exhibits at least four of properties (i)-(vi).

22. The distillate composition of claim 18, which exhibits at least five of properties (i)-(vi).

23. The distillate composition of claim 18, which exhibits properties (i)-(vi).

24. A distillate composition comprising:

at least about 50 wt% naphthenes;

less than about 1.5 wt% aromatics; and

less than about 5 wppm sulfur,

wherein the distillate composition simultaneously exhibits a volumetric energy content of at least about 131,000 BTU/gallon.

25. The distillate composition of claim 24, further comprising about 10 wt% to about 50 wt% of isoparaffins.

26. The distillate composition of claim 24, wherein the naphthenes are present in an amount of at least about 60 wt%.

27. The distillate composition of claim 24, wherein the isoparaffins are present in an amount of about 20 wt% to about 50 wt%.

28. The distillate composition of claim 24, wherein single ring naphthenes are present in an amount of at least about 50% w/w relative to a total amount of naphthenes.

29. The distillate composition of claim 24, wherein multi-ring naphthenes are present in an amount of at least about 50% w/w relative to a total amount of naphthenes.

30. The distillate composition of claim 28, wherein a w/w ratio of the single ring naphthenes to the total naphthenes is about 2:5 to about 5:8.

31. The distillate composition of claim 29, wherein a w/w ratio of the multi-ring naphthenes to the total naphthenes is about 2:5 to about 5:8.

32. The distillate composition of claim 24, wherein single ring naphthenes and multi-ring naphthenes are present in a w/w ratio of about 2:3 to about 3:2.

33. The distillate composition of claim 29, wherein the multi-ring naphthenes are selected from the group consisting of two-ring naphthenes, three-ring naphthenes, four-ring naphthenes, five-ring naphthenes, six-ring naphthenes, and a combination thereof.

34. The distillate composition of claim 33, wherein single ring naphthenes and two-ring naphthenes are present in a collective amount of at least about 60% w/w relative to the total amount of naphthenes.

35. The distillate composition of claim 33, wherein four-ring naphthenes, five-ring naphthenes, and six-ring naphthenes are present in a collective amount of about 5.0% w/w to about 12% w/w relative to the total amount of naphthenes.

36. The distillate composition of claim 33, which satisfies one or more of the following:

(i) four-ring naphthenes are present in an amount of about 2.0% w/w to about 10% w/w relative to the total amount of naphthenes;

(ii) five-ring naphthenes are present in an amount of about 1.0% w/w to about 2.6% w/w relative to the total amount of naphthenes; and

(iii) six-ring naphthenes are present in an amount of about 0.20% w/w to about 1.0% w/w relative to the total amount of naphthenes.

37. The distillate composition of claim 36, wherein the distillate composition satisfies at least two of (i)-(iii).

38. The distillate composition of claim 36, wherein the distillate composition satisfies (i)-(iii).

39. The distillate composition of claim 24, further comprising less than about 10 wt% of n-paraffins.

40. The distillate composition of claim 24, wherein n-paraffins are present in an amount of less than about 20% w/w relative to a total amount of non-cyclic paraffins in the distillate composition.

41. The distillate composition of claim 24, which exhibits at least one of the following properties:

(i) a cetane number of at least about 50;

(ii) a cloud point of less than about -40°C;

(iii) a cold filter plugging point of less than about -20°C;

(iv) a change in viscosity of greater than about 0.400 cSt between about 100°C and about 200°C; and

(v) a smoke point of at least about 25 mm.

42. The distillate composition of claim 42, which exhibits at least two of properties (i)-(vi).

43. The distillate composition of claim 42, which exhibits at least three of properties (i)-(vi).

44. The distillate composition of claim 42, which exhibits at least four of properties (i)-(vi).

45. The distillate composition of claim 42, which exhibits properties (i)-(vi).

46. A distillate composition comprising least about 50 wt% naphthenes and about 10 wt% to about 50 wt% isoparaffins, the distillate composition simultaneously exhibiting a cloud point of less than about -40°C and a cold filter plugging point of less than about -22°C.

47. The distillate composition of claim 46, further satisfying at least one of the following:

the distillate composition comprising less than about 0.10 wt% aromatics;

the distillate composition comprising less than about 10 wt% n-paraffins; and

the distillate composition comprising less than about 5 wppm sulfur.

48. The distillate composition of claim 46, wherein the naphthenes are present in an amount of at least about 60 wt%.

49. The distillate composition of claim 46, wherein the isoparaffins are present in an amount of about 20 wt% to about 50 wt%.

50. The distillate composition of claim 46, wherein single ring naphthenes are present in an amount of at least about 50% w/w relative to a total amount of naphthenes.

51. The distillate composition of claim 46, wherein multi-ring naphthenes are present in an amount of at least about 50% w/w relative to a total amount of naphthenes.

52. The distillate composition of claim 50, wherein a w/w ratio of the single ring naphthenes to the total naphthenes is about 2:5 to about 5:8.

53. The distillate composition of claim 51, wherein a w/w ratio of the multi-ring naphthenes to the total naphthenes is about 2:5 to about 5:8.

54. The distillate composition of claim 46, wherein single ring naphthenes and multi-ring naphthenes are present in a w/w ratio of about 2:3 to about 3:2.

55. The distillate composition of claim 49, wherein the multi-ring naphthenes are selected from the group consisting of two-ring naphthenes, three-ring naphthenes, four-ring naphthenes, five-ring naphthenes, six-ring naphthenes, and a combination thereof.

56. The distillate composition of claim 55, wherein single ring naphthenes and two-ring naphthenes are present in a collective amount of at least about 60% w/w relative to the total amount of naphthenes.

57. The distillate composition of claim 55, wherein four-ring naphthenes, five-ring naphthenes, and six-ring naphthenes are present in a collective amount of about 5.0% w/w to about 12% w/w relative to the total amount of naphthenes.

58. The distillate composition of claim 55, which satisfies one or more of the following:

(i) four-ring naphthenes are present in an amount of about 2.0% w/w to about 10% w/w relative to the total amount of naphthenes;

(ii) five-ring naphthenes are present in an amount of about 1.0% w/w to about 2.6% w/w relative to the total amount of naphthenes; and

(iii) six-ring naphthenes are present in an amount of about 0.20% w/w to about 1.0% w/w relative to the total amount of naphthenes.

59. The distillate composition of claim 58, wherein the distillate composition satisfies at least two of (i)-(iii).

60. The distillate composition of claim 58, wherein the distillate composition satisfies (i)-(iii).

61. The distillate composition of claim 46, wherein n-paraffins are present in an amount of less than about 20% w/w relative to a total amount of non-cyclic paraffins in the distillate composition.

62. The distillate composition of claim 46, which exhibits at least one of the following properties:

(i) a cetane number of at least about 50;

(ii) a smoke point of at least about 25 mm;

(iii) a change in viscosity of greater than about 0.400 cSt between about 100°C and about 200°C; and

(iv) a volumetric energy content of at least about 131,000 BTU/gallon.

63. The distillate composition of claim 62, which exhibits at least two of properties (i)-(vi).

64. The distillate composition of claim 62, which exhibits at least three of properties (i)-(vi).

65. The distillate composition of claim 62, which exhibits properties (i)-(vi).

66. A diesel boiling-range fuel blend comprising at least 10 vol% of the distillate composition of claim 46 and up to 90 vol% of a second distillate composition.

67. The diesel boiling-range fuel blend of claim 66, wherein the distillate composition comprises at least one of the following:

less than about 1.5 wt% aromatics;

about 10 wt% to about 50 wt% isoparaffins; and

less than about 5 wppm sulfur.

68. The diesel boiling-range fuel blend of claim 67, wherein the distillate composition comprises at least about 60 wt% naphthenes.

69. The diesel boiling-range fuel blend of claim 67, wherein distillate composition comprises about 20 wt% to about 50 wt% isoparaffins.

70. The diesel boiling-range fuel blend of claim 68, wherein the distillate composition comprises single ring naphthenes in an amount of at least about 50% w/w relative to a total amount of naphthenes in the distillate composition.

71. The diesel boiling-range fuel blend of claim 68, wherein the distillate composition comprises multi-ring naphthenes in an amount of at least about 50% w/w relative to a total amount of naphthenes in the distillate composition.

72. The diesel boiling-range fuel blend of claim 70, wherein the distillate composition has a w/w ratio of single ring naphthenes to total naphthenes of about 2:5 to about 5:8.

73. The diesel boiling-range fuel blend of claim 71, wherein the distillate composition has a w/w ratio of multi-ring naphthenes to total naphthenes of about 2:5 to about 5:8.

74. The diesel boiling-range fuel blend of claim 68, wherein the distillate composition has a w/w ratio of single ring naphthenes to multi-ring naphthenes of about 2:3 to about 3:2.

75. The diesel boiling-range fuel blend of claim 71, wherein the multi-ring naphthenes in the distillate composition are selected from the group consisting of two-ring naphthenes, three-ring naphthenes, four-ring naphthenes, five-ring naphthenes, six-ring naphthenes, and a combination thereof.

76. The diesel boiling-range fuel blend of claim 75, wherein single ring naphthenes and two-ring naphthenes are present in a collective amount of at least about 60% w/w relative to the total amount of naphthenes in the distillate composition.

77. The diesel boiling-range fuel blend of claim 75, wherein four-ring naphthenes, five-ring naphthenes, and six-ring naphthenes are present in a collective amount of about 5.0% w/w to about 12% w/w relative to the total amount of naphthenes in the distillate composition.

78. The diesel boiling-range fuel blend of claim 75, wherein the distillate composition satisfies one or more of the following:

(i) four-ring naphthenes are present in an amount of about 2.0% w/w to about 10% w/w relative to the total amount of naphthenes;

(ii) five-ring naphthenes are present in an amount of about 1.0% w/w to about 2.6% w/w relative to the total amount of naphthenes; and

(iii) six-ring naphthenes are present in an amount of about 0.20% w/w to about 1.0% w/w relative to the total amount of naphthenes.

79. The diesel boiling-range fuel blend of claim 78, wherein the distillate composition satisfies at least two of (i)-(iii).

80. The diesel boiling-range fuel blend of claim 78, wherein the distillate composition satisfies (i)-(iii).

81. The diesel boiling-range fuel blend of claim 67, wherein the distillate composition comprises less than about 10% w/w n-paraffins.

82. The diesel boiling-range fuel blend of claim 67, wherein the distillate composition comprises less than about 20% w/w n-paraffins relative to a total amount of non-cyclic paraffins in the distillate composition.

83. The diesel boiling-range fuel blend of claim 67, which exhibits at least one of the following properties:

(i) a cetane number of at least about 50;

(ii) a smoke point of at least about 25 mm;

(iii) a change in viscosity of greater than about 0.400 cSt between about 100°C and about 200°C; and

(iv) a volumetric energy content of at least about 131,000 BTU/gallon.

84. The diesel boiling-range fuel blend of claim 83, which exhibits at least two of properties (i)-(vi).

85. The diesel boiling-range fuel blend of claim 83, which exhibits at least three of properties (i)-(vi).

86. The diesel boiling-range fuel blend of claim 83, which exhibits properties (i)-(vi).

87. The diesel boiling-range fuel blend of claim 66, which comprises at least about 25 vol% of the distillate composition.

88. The diesel boiling-range fuel blend of claim 66, which comprises at least about 50 vol% of the distillate composition.

89. The diesel boiling-range fuel blend of claim 66, which comprises at least about 75 vol% of the distillate composition.

90. The diesel boiling-range fuel blend of claim 67, further comprising an additive for improving cold flow properties.

91. The diesel boiling-range fuel blend of claim 90, which comprises at least about 100 vppm of the additive.

92. The diesel boiling-range fuel blend of claim 90, which comprises at least about 400 vppm of the additive.

93. The diesel boiling-range fuel blend of claim 90, which comprises at least about 700 vppm of the additive.

94. The diesel boiling-range fuel blend of claim 90, which comprises at most about 2000 vppm of the additive.

95. The diesel boiling-range fuel blend of claim 67, which exhibits a cloud point of less than about -9°C and a cold filter plugging point of about -13°C or less.

96. The diesel fuel boiling-range blend of claim 90, which exhibits a cloud point of about -10°C or less and a cold filter plugging point of about -15°C or less.

97. The diesel fuel boiling-range blend of claim 90, which exhibits a cloud point of about -10°C or less and a cold filter plugging point of about -30°C or less.

98. The diesel fuel boiling-range blend of claim 90, which exhibits at least about 10°C difference between cloud point and cold filter plugging point.

99. The diesel fuel boiling-range blend of claim 66, wherein the second distillate composition is selected from the group consisting of off-spec diesel fuel, on-spec diesel fuel, renewable diesel, light cycle oil, heavy catalytic naphtha, gasoil, straight-run distillate, turbine fuel, kerosene, heating oil, distillate boiling range marine fuel/blendstock, distillate boiling range bunker fuel/blendstock, and a combination thereof.

100. A method of producing diesel boiling-range fuel with improved cold flow properties, the method comprising blending at least 10 vol% of the distillate composition of claim 46 with up to 90 vol% of a second distillate composition to form the diesel boiling-range fuel.

101. The method of claim 100, wherein the distillate composition comprises at least one of the following:

less than about 1.5 wt% aromatics;

about 10 wt% to about 50 wt% isoparaffins; and

less than about 5 wppm sulfur.

102. The method of claim 101, wherein the distillate composition comprises at least about 60 wt% naphthenes.

103. The method of claim 101, wherein distillate composition comprises about 20 wt% to about 50 wt% isoparaffins.

104. The method of claim 102, wherein the distillate composition comprises single ring naphthenes in an amount of at least about 50% w/w relative to a total amount of naphthenes in the distillate composition.

105. The method of claim 102, wherein the distillate composition comprises multi-ring naphthenes in an amount of at least about 50% w/w relative to a total amount of naphthenes in the distillate composition.

106. The method of claim 104, wherein the distillate composition has a w/w ratio of single ring naphthenes to total naphthenes of about 2:5 to about 5:8.

107. The method of claim 105, wherein the distillate composition has a w/w ratio of multi-ring naphthenes to total naphthenes of about 2:5 to about 5:8.

108. The method of claim 102, wherein the distillate composition has a w/w ratio of single ring naphthenes to multi-ring naphthenes of about 2:3 to about 3:2.

109. The method of claim 105, wherein the multi-ring naphthenes in the distillate composition are selected from the group consisting of two-ring naphthenes, three-ring naphthenes, four-ring naphthenes, five-ring naphthenes, six-ring naphthenes, and a combination thereof.

110. The method of claim 109, wherein single ring naphthenes and two-ring naphthenes are present in a collective amount of at least about 60% w/w relative to the total amount of naphthenes in the distillate composition.

111. The method of claim 109, wherein four-ring naphthenes, five-ring naphthenes, and six-ring naphthenes are present in a collective amount of about 5.0% w/w to about 12% w/w relative to the total amount of naphthenes.

112. The method of claim 109, wherein the distillate composition satisfies one or more of the following:

(i) four-ring naphthenes are present in an amount of about 2.0% w/w to about 10% w/w relative to the total amount of naphthenes;

(ii) five-ring naphthenes are present in an amount of about 1.0% w/w to about 2.6% w/w relative to the total amount of naphthenes; and

(iii) six-ring naphthenes are present in an amount of about 0.20% w/w to about 1.0% w/w relative to the total amount of naphthenes.

113. The method of claim 112, wherein the distillate composition satisfies at least two of (i)-(iii).

114. The method of claim 112, wherein the distillate composition satisfies (i)-(iii).

115. The method of claim 101, wherein the distillate composition comprises less than about 10% w/w n-paraffins.

116. The method of claim 101, wherein the distillate composition comprises less than about 20% w/w n-paraffins relative to a total amount of non-cyclic paraffins in the distillate composition.

117. The method of claim 101, wherein the distillate composition exhibits at least one of the following properties:

(i) a cetane number of at least about 50;

(ii) a smoke point of at least about 25 mm;

(iii) a change in viscosity of greater than about 0.400 cSt between about 100°C and about 200°C; and

(iv) a volumetric energy content of at least about 131,000 BTU/gallon.

118. The method of claim 117, wherein the distillate composition exhibits at least two of properties (i)-(vi).

119. The method of claim 117, wherein the distillate composition exhibits at least three of properties (i)-(vi).

120. The method of claim 117, wherein the distillate composition exhibits properties (i)-(vi).

121. The method of claim 100, wherein the diesel boiling-range fuel comprises at least about 25 vol% of the distillate composition.

122. The method of claim 100, wherein the diesel boiling-range fuel comprises at least about 50 vol% of the distillate composition.

123. The method of claim 100, wherein the diesel boiling-range fuel comprises at least about 75 vol% of the distillate composition.

124. The method of claim 101, further comprising introducing an additive for improving cold flow properties.

125. The method of claim 124, which comprises introducing at least about 100 vppm of the additive.

126. The method of claim 124, which comprises introducing at least about 400 vppm of the additive.

127. The method of claim 124, which comprises introducing at least about 700 vppm of the additive.

128. The method of claim 124, which comprises introducing at most about 2000 vppm of the additive.

129. The method of claim 100, wherein the diesel boiling-range fuel exhibits a cloud point and a cold filter plugging point, both of which are less than a corresponding cloud point and a corresponding cold filter plugging point of the second distillate composition before blending with the distillate composition.

130. The method of claim 101, wherein the diesel boiling-range fuel exhibits a cloud point of less than about -9°C and a cold filter plugging point of about -13°C or less.

131. The method of claim 125, wherein the diesel boiling-range fuel exhibits a cloud point of about -10°C or less and a cold filter plugging point of about -15°C or less.

132. The method of claim 125, wherein the diesel boiling-range fuel exhibits a cloud point of about -10°C or less and a cold filter plugging point of about -30°C or less.

133. The method of claim 125, which exhibits at least about 10°C difference between cloud point and cold filter plugging point.

134. The method of claim 100, wherein the second distillate composition is selected from the group consisting of off-spec diesel fuel, on-spec diesel fuel, renewable diesel, light cycle oil, heavy catalytic naphtha, gasoil, straight-run distillate, turbine fuel, kerosene, heating oil, distillate boiling range marine fuel/blendstock, distillate boiling range bunker fuel/blendstock, and a combination thereof.

135. A method of increasing fuel economy of a diesel boiling-range fuel, the method comprising blending at least 10 vol% of the distillate composition of claim 24 with up to 90 vol% of a second distillate composition to form the diesel boiling-range fuel.

136. The method of claim 135, wherein the distillate composition further comprises about 10 wt% to about 50 wt% isoparaffins.

137. The method of claim 135, wherein the distillate composition comprises at least about 60 wt% naphthenes.

138. The method of claim 136, wherein distillate composition comprises about 20 wt% to about 50 wt% isoparaffins.

139. The method of claim 137, wherein the distillate composition comprises single ring naphthenes in an amount of at least about 50% w/w relative to a total amount of naphthenes in the distillate composition.

140. The method of claim 137, wherein the distillate composition comprises multi-ring naphthenes in an amount of at least about 50% w/w relative to a total amount of naphthenes in the distillate composition.

141. The method of claim 139, wherein the distillate composition has a w/w ratio of single ring naphthenes to total naphthenes of about 2:5 to about 5:8.

142. The method of claim 140, wherein the distillate composition has a w/w ratio of multi-ring naphthenes to total naphthenes of about 2:5 to about 5:8.

143. The method of claim 139, wherein the distillate composition has a w/w ratio of single ring naphthenes to multi-ring naphthenes of about 2:3 to about 3:2.

144. The method of claim 140, wherein the multi-ring naphthenes in the distillate composition are selected from the group consisting of two-ring naphthenes, three-ring naphthenes, four-ring naphthenes, five-ring naphthenes, six-ring naphthenes, and a combination thereof.

145. The method of claim 144, wherein single ring naphthenes and two-ring naphthenes are present in a collective amount of at least about 60% w/w relative to the total amount of naphthenes in the distillate composition.

146. The method of claim 144, wherein four-ring naphthenes, five-ring naphthenes, and six-ring naphthenes are present in a collective amount of about 5.0% w/w to about 12% w/w relative to the total amount of naphthenes.

147. The method of claim 144, wherein the distillate composition satisfies one or more of the following:

(i) four-ring naphthenes are present in an amount of about 2.0% w/w to about 10% w/w relative to the total amount of naphthenes;

(ii) five-ring naphthenes are present in an amount of about 1.0% w/w to about 2.6% w/w relative to the total amount of naphthenes; and

(iii) six-ring naphthenes are present in an amount of about 0.20% w/w to about 1.0% w/w relative to the total amount of naphthenes.

148. The method of claim 147, wherein the distillate composition satisfies at least two of (i)-(iii).

149. The method of claim 147, wherein the distillate composition satisfies (i)-(iii).

150. The method of claim 135, wherein the distillate composition comprises less than about 10% w/w n-paraffins.

151. The method of claim 135, wherein the distillate composition comprises less than about 20% w/w n-paraffins relative to a total amount of non-cyclic paraffins in the distillate composition.

152. The method of claim 135, wherein the distillate composition exhibits at least one of the following properties:

(i) a cetane number of at least about 50;

(ii) a cloud point of less than about -40°C;

(iii) a cold filter plugging point of less than about -20°C;

(iv) a change in viscosity of greater than about 0.400 cSt between about 100°C and about 200°C; and

(v) a smoke point of at least about 25 mm.

153. The method of claim 135, wherein the distillate composition exhibits at least two of properties (i)-(vi).

154. The method of claim 135, wherein the distillate composition exhibits at least three of properties (i)-(vi).

155. The method of claim 135, wherein the distillate composition exhibits at least four of properties (i)-(vi).

156. The method of claim 135, wherein the distillate composition exhibits properties (i)-(vi).

157. The method of claim 135, wherein the distillate composition exhibits a volumetric energy content of at least about 135,000 BTU/gallon.

158. The method of claim 135, wherein, after blending the second distillate composition and the distillate composition, the diesel boiling-range fuel exhibits a volumetric energy content higher than a corresponding volumetric energy content of the second distillate composition before blending with the distillate composition.

159. The method of claim 135, wherein the second distillate composition exhibits a volumetric energy content of at most about 120,000 BTU/gallon before blending with the distillate

composition, and wherein the diesel boiling-range fuel exhibits a volumetric energy content of at least about 125,000 BTU/gallon.

160. The method of claim 135, wherein the second distillate composition exhibits a volumetric energy content of at most about120,000 BTU/gallon before blending with the distillate composition, and wherein the diesel boiling-range fuel exhibits a volumetric energy content of at least about 130,000 BTU/gallon.

161. The method of claim 135, wherein the second distillate composition is selected from the group consisting of off-spec diesel fuel, on-spec diesel fuel, renewable diesel, light cycle oil, heavy catalytic naphtha, gasoil, straight-run distillate, turbine fuel, kerosene, heating oil, distillate boiling range marine fuel/blendstock, distillate boiling range bunker fuel/blendstock, and a combination thereof.

162. The method of claim 135, wherein the second distillate composition comprises or is renewable diesel, and wherein the diesel boiling-range fuel exhibits a volumetric energy content at least 3% higher than a corresponding volumetric energy content of the renewable diesel before blending with the distillate composition.