CLAIMS

1. A method comprising:

a) contacting a fatty acid feed with ~~a decarboxylation-coupling dimerization~~ an alumina catalyst in a decarboxylation-coupling dimerization zone under decarboxylation-coupling dimerization conditions to yield a dimer ketone;

b) hydrocracking the dimer ketone with a hydrocracking catalyst in a hydrocracking zone under hydrocracking conditions to yield a mixture of paraffins comprising a heavy waxy oil component and a diesel fuel component; ~~and~~

c) distilling the mixture to yield a heavy waxy oil and a diesel fuel; and

d) hydroisomerization dewaxing the heavy waxy oil with a hydroisomerization dewaxing catalyst in a catalytic hydroisomerization dewaxing zone under hydroisomerization dewaxing conditions to yield a lubricating base oil.

2. The method of claim 1, wherein the fatty acid feed is derived from biomass.

3. The method of claim 1, wherein the fatty acid feed comprises at least 75 wt. % saturated fatty acids.

4. The method of claim 3, wherein the saturated fatty acids are selected from the group consisting of caproic acid, caprylic acid, capric acid, lauric acid, myristic acid, palmitic acid, stearic acid, arachidic acid, palm kernel oil acid, palm oil acid, coconut oil acid, soy bean oil acid, rape seed oil fatty acid, animal tallow derived fatty acids, and combinations thereof.

~~5. The method of claim 1, wherein the decarboxylation-coupling dimerization catalyst is selected from the group consisting of alumina, silica, silica-alumina, titania, zirconia, supported metal carbonates, supported metal hydroxides, and combinations thereof.~~

~~6~~5. The method of claim 1, wherein the diesel fuel is a biofuel.

~~7~~6. The method of claim 1, wherein the diesel fuel has a cetane index of at least 65.

~~8. The method of claim 1, further comprising hydroisomerization dewaxing the heavy waxy oil with a hydroisomerization dewaxing catalyst in a catalytic hydroisomerization dewaxing zone under hydroisomerization dewaxing conditions to yield a lubricating base oil.~~

~~9~~7. The method of claim ~~8~~1, wherein the hydroisomerization dewaxing catalyst comprises a shape selective intermediate pore size molecular sieve, a noble metal hydrogenation component, and at least a refractory oxide support.

~~10~~8. The method of claim ~~9~~7, wherein the molecular sieve is selected from the group consisting of SAPO-11, SAPO-31, SAPO-41, SM-3, SM-7, ZSM-22, ZSM-23, ZSM-35, ZSM-48, ZSM-57, SSZ-32, ferrierite, and combinations thereof.

~~11~~9. The method of claim ~~8~~1, wherein the base oil has a viscosity index of at least 140.

~~12~~10. The method of claim ~~8~~1, wherein the base oil has a viscosity index of at least 170.

~~13~~11. The method of claim ~~8~~1, wherein the base oil is a Group III base oil.

~~14~~12. The method of claim ~~8~~1, further comprising a step of hydrofinishing the base oil.

~~15~~13. A method comprising:

a) contacting a fatty acid feed with a decarboxylation-coupling dimerization catalyst in a decarboxylation-coupling dimerization zone under decarboxylation-coupling dimerization conditions to yield a dimer ketone; and

b) hydroisomerization dewaxing the dimer ketone with a hydroisomerization dewaxing catalyst in a catalytic hydroisomerization zone under hydroisomerization dewaxing conditions to yield a lubricating base oil,

wherein the decarboxylation-coupling dimerization catalyst is alumina.