CLAIMS:

1. A method of generating energy comprising:

combusting a saccharified biomass material to produce energy.

2. The method of claim 1, wherein the saccharified biomass material includes cells.

3. The method of claims 2, wherein the cells are selected from the group consisting of yeast cells, bacterial cells, fungal cells and mixtures thereof.

4. The method of any of the above claims, wherein the saccharified biomass material includes protein material.

5. The method of claim 4, wherein the protein material is an enzyme material.

6. The method of any one of the above claims, wherein the saccharified material includes denatured enzyme material.

7. The method of any one of the above claims, wherein the saccharified biomass material comprises lignocellulosic residue from lignocellulosic material that has been treated to reduce its recalcitrance prior to saccharification.

8. The method of claim 7, wherein the lignocellulosic material has been treated with accelerated electrons to reduce its recalcitrance.

9. The method of claim 8, wherein the electrons have an average energy between about 0.3 MeV and about 5 MeV.

10. The method of claim 8, wherein the electrons have an average energy between about 0.5 MeV and about 3.5 MeV.

11. The method of claim 8, wherein the electrons have an average energy between 0.8 MeV and about 2 MeV.

12. The method of any one of claims 8 through 11, wherein the lignocellulosic biomass has been treated to a total dose between about 10 Mrad and about 100 Mrad.

13. The method of any one of claims 8 through 11, wherein the lignocellulosic biomass has been treated to a total dose between about15 Mrad and about 50 Mrad.

14. The method of any one of claims 8 through 11, wherein the lignocellulosic biomass has been treated to a total dose between about 20 Mrad and about 45 Mrad.

15. The method of any one of claims 8 through 11, wherein the lignocellulosic biomass has been treated to a total dose between about 25 Mrad and about 40 Mrad.

16. The method of any one of the above claims, wherein the saccharified biomass material includes inorganic solids.

17. The method of claim 16, wherein the inorganic solids is selected from the group consisting of diatomaceous earth, celite, silica, pumice, perlite, alumina, zeolites, sand and mixtures thereof.

18. The method of any one of the above claims, wherein the saccharified biomass material includes less than 60 percent moisture.

19. The method of any one of claims 1 through 17, wherein the saccharified biomass material includes less than 50 percent moisture.

20. The method of any one of claims 1 through 17, wherein the saccharified biomass material includes less than 45 percent moisture.

21. The method of any one of claims 1 through 17, wherein the saccharified biomass material includes less than 40 percent moisture.

22. The method of any one of claims 1 through 17, wherein the saccharified biomass material includes less than 30 percent moisture.

23. The method of any one of the above claims, wherein saccharified biomass material includes less than 5 percent ash after combustion.

24. The method of any one of the above claims, wherein the saccharified biomass material includes less than 0.5 percent sulfur.

25. The method of any one of the above claims, wherein combustion produces greater than about 3500 BTU of energy per pound of the saccharified biomass material.

26. The method of any one of claims 1 through 24, wherein combustion produces greater than about 4000 BTU of energy per pound of the saccharified biomass material.

27. The method of any one of claims 1 through 24, wherein combustion produces greater than about 4500 BTU of energy per pound of the saccharified biomass material.

28. The method of any one of claims 1 through 24, wherein combustion produces greater than about 5000 BTU of energy per pound of the saccharified biomass material.

29. The method any one of claims 1 through 24, wherein combustion produces greater than about 6000 BTU of energy per pound of the saccharified biomass material.

30. The method of any one of claims 1 through 24, wherein combustion produces greater than about 7000 BTU of energy per pound of the saccharified biomass material.

31. The method of any one of the above claims, wherein the saccharified biomass material includes less than 35 percent by weight carbohydrates on a dry basis.

32. The method of any one of claims 1 through 30, wherein the saccharified biomass material includes less than 30 percent by weight carbohydrates on a dry basis.

33. The method of any one of claims 1 through 30, wherein the saccharified biomass material includes less than 25 percent by weight carbohydrates on a dry basis.

34. The method of any one of claims 1 through 30, wherein the saccharified biomass material includes less than 20 percent by weight carbohydrates on a dry basis.

35. The method of any one of claims 1 through 30, wherein the saccharified biomass material includes less than 10 percent by weight carbohydrates on a dry basis.

36. The method of any one of the above claims, wherein the energy is in the form of heat.

37. The method of any one of the above claims, wherein the energy is in the form of electrical energy.

38. The method of any one of the above claims, wherein during combustion a boiler is utilized.

39. The method of claim 38, wherein the boiler is selected from the group consisting of a stoker grate boiler, a fluidized bed boiler and a co-fired boiler.

40. The method of any of one of the above claims, wherein during combustion, a gasifier is utilized.

41. The method of claim 40, wherein the gasifier is a fixed bed or a fluidized bed gasifier.

42. The method of any one of the above claims, wherein the saccharified biomass is collected utilizing a rotary drum filter prior to combustion.

43. The method of any one of the above claims, wherein the saccharified biomass is collected utilizing a centrifuge prior to combustion.

44. A method of processing a biomass material, the method comprising;

processing a first portion of lignocellulosic material into a product and a solid residue,

combusting the solid residue in a boiler to produce steam,

coupling the steam to a turbine to produce electricity, and

using the steam and/or electric energy to process a second portion of lignocellulosic material into a product.

45. The method of claim 44, wherein processing comprises irradiating.

46. The method of claim 44 or 45, wherein processing comprises saccharifying.

47. The method of claim 46, wherein saccharifying produces glucose.

48. The method of claim 46 or 47, wherein saccharifying produces xylose.

49. The method of any one of claims 44 through 48, wherein processing comprises fermentation.

50. The method of any one of claims 44 through 49, further comprising drying the solid residue prior to combusting the solid residue.

51. The method of claim 50, wherein drying reduces the moisture content of the solid residue to less than about 25 wt.% water.

52. The method of claim 50, wherein drying reduces the moisture content of the solid residue to less than about 20 wt.% water.

53. The method of claim 50, wherein drying reduces the moisture content of the solid residue to less than about 15 wt.% water.

54. The method of any one of claims 50 through 53, wherein the residue is dried using a screw dryer.

55. The method of any one of claims 44 through 54, further comprising combining the residue with a drying agent.

56. The method of claim 55, wherein the drying agent is a fine biomass material.

57. The method of claim 56, wherein the fine biomass material has a medium particle size of less than about 1mm.

58. The method of claim 56, wherein the fine biomass material has a medium particle size of less than about 500 micro meters.

59. The method of claim 56, wherein the fine biomass material has a medium particle size of less than about100 micro meters.

60. The method of any one of claims 44 through 59, further comprising forming the residue into a form selected from cakes, pellets, densified shapes, powder or combinations thereof prior to combusting.

61. The method of any one of claims 44 through 60, wherein the residue, when in a dry form with less than 5 wt.% water, has an energy content of at least 4000 BTU per pound of the residue.

62. The method of any one of claims 44 through 61, wherein the residue includes at least 0.1% nitrogen in a nitrogen(III) compound.

63. The method of claim 62, wherein the nitrogen (III) compound is selected from the group consisting of proteins, denatured proteins, protein residues, amino acids, amino acid residues, urea, ammonia and combinations thereof.

64. The method of any one of claims 44 through 63, wherein the lignocellulosic material is selected from the group consisting of wood, particle board, sawdust, agricultural waste, sewage, silage, grasses, rice hulls, bagasse, cotton, jute, hemp, flax, bamboo, sisal, abaca, straw, corn cobs, corn stover, switchgrass, alfalfa, hay, coconut hair, seaweed, algae, and combinations thereof.

CLAIMS:

1. A method of generating energy comprising:

saccharifying a biomass feedstock to form a saccharified biomass material;

combining a portion of the biomass feedstock with the saccharified biomass material to form a mixture; and

combusting the mixture to produce energy.

2. The method of claim 1, wherein the saccharified biomass material includes cells.

3. The method of claim 2, wherein the cells are selected from the group consisting of yeast cells, bacterial cells, fungal cells and mixtures thereof.

4. The method of any of the above claims, wherein the saccharified biomass material includes protein material.

5. The method of claim 4, wherein the protein material is an enzyme material.

6. The method of any one of the above claims, wherein the saccharified material includes denatured enzyme material.

7. The method of any one of the above claims, wherein the saccharified biomass material comprises lignocellulosic residue from lignocellulosic material that has been treated to reduce its recalcitrance prior to saccharification.

8. The method of claim 7, wherein the lignocellulosic material has been treated with accelerated electrons to reduce its recalcitrance.

9. The method of claim 8, wherein the electrons have an average energy between about 0.3 MeV and about 5 MeV, or between about 0.5 MeV and about 3.5 MeV, or between about 0.8 MeV and about 2 MeV.

10. The method of claim 9, wherein the lignocellulosic biomass has been treated to a total dose between about 10 Mrad and about 100 Mrad, or between about 15 Mrad and about 50 Mrad, or between about 20 Mrad and about 45 Mrad, or between about 25 Mrad and about 40 Mrad.

11. The method of any one of the above claims, wherein the saccharified biomass material includes inorganic solids.

12. The method of claim 11, wherein the inorganic solids is selected from the group consisting of diatomaceous earth, celite, silica, pumice, perlite, alumina, zeolites, sand and mixtures thereof.

13. The method of any one of the above claims, wherein the saccharified biomass material includes less than 60 percent moisture, or less than 50 percent moisture, or less than 45 percent moisture, or less than 40 percent moisture, or less than 30 percent moisture.

14. The method of any one of the above claims, wherein saccharified biomass material includes less than 5 percent ash after combustion.

15. The method of any one of the above claims, wherein the saccharified biomass material includes less than 0.5 percent sulfur.

16. The method of any one of the above claims, wherein the saccharified biomass material includes less than 35 percent by weight carbohydrates on a dry basis, or less than 30 percent by weight carbohydrates on a dry basis, or less than 25 percent by weight carbohydrates on a dry basis, or less than 20 percent by weight carbohydrates on a dry basis, or less than 10 percent by weight carbohydrates on a dry basis.

17. The method of any one of the above claims, wherein the energy is in the form of heat or electrical energy.

18. The method of any one of the above claims, wherein during combustion a boiler is utilized.

19. The method of claim 18, wherein the boiler is selected from the group consisting of a stoker grate boiler, a fluidized bed boiler and a co-fired boiler.

20. The method of any of one of the above claims, wherein during combustion, a gasifier is utilized.

21. The method of claim 20, wherein the gasifier is a fixed bed or a fluidized bed gasifier.

22. The method of any one of the above claims, wherein the saccharified biomass is collected utilizing a rotary drum filter prior to combustion.

23. The method of any one of the above claims, wherein the saccharified biomass is collected utilizing a centrifuge prior to combustion.