CLAIMS

What is claimed is:

1. A process comprising:
    a) treating spent halogenated liquids to produce reclaimed halogenated liquids, wherein the spent halogenated liquids are selected from the group consisting of refrigerants, refrigerant blends, blowing agents, solvent, and immersion coolants, and
    b) collecting or packaging the reclaimed halogenated liquids.
2. The process of claim 1, wherein the spent halogenated liquids comprise at least one of hydrochloroolefin (HCO), hydrofluoroolefin (HFO), hydrochlorofluoroolefin (HCFO), hydrofluoroether (HFE), hydrofluoroolefinic ether (HFOE), chlorofluoroolefin (CFO), fluoroketone, or hydrofluoroketone (HFK).
3. The process of claim 2, wherein the hydrofluoroether (HFE) comprises a liquid selected from the group consisting of methoxy-nonafluorobutane; ethoxy-nonafluorobutane; 1,1,1,2,2,3,4,5,5,5-decafluoro 3-methoxy-4-(trifluoromethyl) pentane; 3-ethoxy-1,1,1,2,3,4,4,5,5,6,6,6-dodecafluoro-2-(trifluoromethyl)hexane; blend comprising 50% methyl nonafluorobutyl ether and 50% trans-1,2-dichloroethylene; blend comprising 52.7% methyl nonafluorobutyl ether, 44.6% trans-1,2-dichloroethylene and 2.7% ethanol; blend comprising 10% methyl nonafluorobutyl ether, 20% ethyl nonafluorobutyl ether, 68% trans-1,2-dichloroethylene and 2% isopropanol; blend comprising 10% methyl nonafluorobutyl ether, 20% ethyl nonafluorobutyl ether and 70% trans-1,2-dichloroethylene; blend comprising 95.5% methyl nonafluorobutyl ether and 4.5% isopropanol, and/or blend comprising 1,1,1,2,2,3,4,5,5,5-decafluoro 3-methoxy-4-(trfluoromethyl) pentane and trans-1,2-dichloroethylene.
4. The process of any one of claims 1-3, wherein the spent halogenated liquids are collected from unreclaimed halogenated liquids prior to a).
5. The process of claim 4, wherein, prior to a), the unreclaimed halogenated liquids are analyzed to determine (i) the composition of the unreclaimed

halogenated liquids and the presence and nature of any contaminants; or (ii) physical and chemical properties of the unreclaimed halogenated liquids.

6. The process of claim 5, wherein the unreclaimed halogenated liquids are analyzed using at least one analytical technique selected from the group consisting of GC-FID, GC-TCD, GC-MS, FTIR, Goetz Bub, Karl Fischer, Byk-Garner Color.

7. The process of any one of claims 1-6, wherein the treating comprises at least one treatment selected from the group consisting of distillation, adsorption, desorption, cryogenic cooling, moisture removal, a contaminant removal, solids filters, acidity neutralization, and high boiling residue/chloride distillation.

8. The process of claim 1, wherein the spent halogenated liquid is selected from the group consisting of: E-1,2-dichloroethene; HFO-E/Z-1336mzz; HCFO-E/Z-1224yd; HCFO-E/Z-1233zd; R-514A; HFO-Z/E 1336mzz blends; cis-1,1,1,4,4,4-hexafluorobut-2-ene (R-1336mzz(Z)) and trans-1,2-dichloroethene (R-1130(E)); liquid HFC-245fa; 1,1,1,2,3,4,4,5,5,5-decafluoropentane; MPHE; a blend comprising 94% trans-1,2-dichloroethylene, 5% MPHE and 1% 1,1,1,2,3,4,4,5,5,5-decafluoropentane; a blend comprising 94% trans-1,2-dichloroethylene, 5% MPHE and 1% Z-HFO-1336mzz; a blend comprising 98.4% Z-HFO-1336mzz and 1.6 % ethanol; a blend comprising 60% Z-HFO-1336mzz, 25% MPHE and 15% ethanol; a blend comprising 75% Z-HFO-1336mzz and 25% trans-1,2-dichloroethylene; (Z)-1,1,1,4,4,4-hexafluoro-2-butene; 1,1,1,4,5,5,5-heptafluoro-4-(trifluoromethyl)pent-2-ene; 1,1,1,2,2,3,3,6,6,7,7,8,8,8-tetradecafluoro-4-octene; 1,1,1,2,2,5,5,6,6,6-decafluorohex-3-ene; and 1,1,1,2,2,3,3,4,4,7,7,8,8,9,9,10,10,10-octadecafluorodec-5-ene.

9. The process of any one of claims 1-8, further comprising adding to the reclaimed halogenated liquids:

   (i) a tracer; and/or

   (ii) a stabilizer package including at least one antioxidant, at least one acid acceptor and at least one metal stabilizer, wherein the at least one antioxidant is selected from the group consisting of butylated hydroxytoluene, butylated hydroxyanisole, tertiary-butylhydroquinone, 4-

methoxyphenol, propyl 3,4,5-trihydroxybenzoate, the acid acceptor is selected from epoxy butane, amine and acetaldehyde di-methylhydrazone (ADH), and the metal stabilizer is selected from N,N′-bis(salicylidene)-1,2-propanediamine, benzotriazole and its derivatives.

10. A process of exchanging heat comprising circulating the reclaimed halogenated liquid of any one of claims 1-9, and transferring heat to and from the reclaimed halogenated liquid.

11. A process of exchanging heat comprising charging a system with a working fluid comprising the reclaimed halogenated liquid of any one of claims 1-9, and circulating the working fluid.

12. A process of cooling electrical components comprising directly contacting the component with the reclaimed halogenated liquid of any one of claims 1-9.

13. A process comprising:

    a) treating foam waste to produce reclaimed foam polymer, and

    b) collecting or packaging the reclaimed foam polymer.

14. The process of claim 13, wherein the foam waste is treated by crushing.

15. The process of claim 13 or claim 14, wherein the foam waste is collected from unreclaimed foam waste prior to a).

16. The process of any one of claims 13-15, wherein the treating comprises at least one treatment selected from the group consisting of distillation, adsorption, desorption, cryogenic cooling, moisture removal, a contaminant removal, solids filters, acidity neutralization, and high boiling residue/chloride distillation.

17. The process of any one of claims 13-16, wherein the foam waste comprises halogenated hydrocarbon generated foams which are crushed under vacuum to produce crushed foam and a vapor stream.

18. The process of claim 17, wherein the vapor stream is removed from the crushed foam.

19. The process of claim 18, wherein the crushed foam is isolated and pelletized.

20. The process of any one of claims 13-16, wherein the foam waste is a polyurethane foam which is crushed, pelletized and converted chemically reduced a liquid polyol.

21. An integrated system comprising:

    - an unreclaimed liquid recovery station;
    - a weighing and testing station comprising analytical systems to determine physical and chemical properties of an unreclaimed liquid;
    - a first purification system configured to receive and treat the unreclaimed liquid from said weighing and testing station;
    - a second purification system configured to receive and treat liquid from the first purification system; and
    - a target refrigerant system in flow communication with a first transport line to receive treated liquid from the first purification system for adjusting levels of reclaimed liquid components to target refrigerant levels of AHRI 700 standards following purification at said first and second purification stations.

22. The integrated system of claim 21, further comprising a blending station configured to provide reclaimed liquid blends components consistent with AHRI 700 standards.

23. The integrated system of claim 21 or claim 22, further comprising a stabilizer package dispensing station configured to add effective quantities of a stabilizer package comprising at least one antioxidant, at least one acid acceptor and at least one metal stabilizer.

24. The integrated system of any one of claims 21-23, further comprising a purity check station configured to check the purity of unreclaimed liquid before purification, after the first and/or second purification treatments, and of the at least one first treated product and determining whether or not the first treated product meets or exceeds AHRI 700 standards.

25. The integrated system of any one of claims 21-24, further comprising a waste foam collecting station and a waste foam treatment station comprising at least one crusher, at least one solids sorter, and at least one pelletizer with vapor

separation, wherein the first purification system is configured to receive and treat vapor from said waste foam treatment station, and wherein the second purification system is configured to receive and treat vapor from the first purification system.

26. The integrated system of claim 25, wherein the waste foam treatment station is adapted to crush and pelletize polyurethane foam for one of subsequent use or recycle to a liquid polyol.

27. The integrated system of any one of claims 21-26, wherein the unreclaimed liquid is selected from the group consisting of HFO-E/Z-1336mzz; HCFO-1224yd; HCFO-1233zd; R-514A (olefin blend comprised of cis-1,1,1,4,4,4-hexafluorobut-2-ene (R-1336mzz(Z)) and trans-1,2-dichloroethene (R-1130(E)); HFO-Z/E 1336mzz blends; liquid HFC-245fa; 1,1,1,2,3,4,4,5,5,5-decafluoropentane; MPHE; a blend comprising 94% trans-1,2-dichloroethylene, 5% MPHE and 1% 1,1,1,2,3,4,4,5,5,5-decafluoropentane; a blend comprising 94% trans-1,2-dichloroethylene, 5% MPHE and 1% Z-1336mzz; a blend comprising 98.4% Z-1336mzz and 1.6 % ethanol; a blend comprising 60% Z-1336mzz, 25% MPHE and 15% ethanol; a blend comprising 75% Z-1336mzz and 25% trans-1,2-dichloroethylene; (Z)-1,1,1,4,4,4-hexafluoro-2-butene; 1,1,1,4,5,5,5-heptafluoro-4-(trifluoromethyl)pent-2-ene; 1,1,1,2,2,3,3,6,6,7,7,8,8,8-tetradecafluoro-4-octene; 1,1,1,2,2,5,5,6,6,6-decafluorohex-3-ene; and 1,1,1,2,2,3,3,4,4,7,7,8,8,9,9,10,10,10-octadecafluorodec-5-ene.

28. The integrated system of any one of claims 21-27, wherein at least one of the first and second purification systems includes at least one of a distillation column, an adsorption/desorption column, a cryogenic cooler; an NCG purge unit, a water distillation or desiccant dryer unit, a solids filter unit, an acidity neutralizer, and a high distillation residue column.