CLAIMS

1. A system, comprising:

a gas turbine system, comprising:

a turbine combustor;

a turbine driven by combustion products from the turbine combustor;

an exhaust gas compressor driven by the turbine, wherein the exhaust gas compressor is configured to compress and supply an exhaust gas to the turbine combustor;

an exhaust gas recirculation (EGR) system, wherein the EGR system is configured to recirculate the exhaust gas along an exhaust recirculation path from the turbine to the exhaust gas compressor;

a main oxidant compression system configured to supply compressed oxidant to the gas turbine system, and the main oxidant compression system comprises:

a first oxidant compressor;

a first gearbox configured to enable the first oxidant compressor to operate at a first speed different from a first operating speed of the gas turbine system;

wherein the main oxidant compression system is driven at least partially by the gas turbine system, and the main oxidant compression system comprises a plurality of compression stages including the first oxidant compressor and a second oxidant compressor, wherein the first oxidant compressor is driven by the gas turbine system through the first gearbox;

an electrical generator coupled to a shaft of the gas turbine system, wherein the first oxidant compressor is coupled to the electrical generator via the first gearbox;

a drive coupled to the second oxidant compressor, wherein the drive comprises a steam turbine or an electric motor; and

a second gearbox coupling the second oxidant compressor and the drive, wherein the second gearbox is configured to enable the second oxidant compressor to operate at a second speed different from a second operating speed of the drive.

2. The system of claim 1, wherein the first gearbox comprises a parallel shaft gearbox having input and output shafts that are generally parallel with one another, the input shaft is in line with a shaft line of the gas turbine system, and the output shaft is drivingly coupled to the first oxidant compressor, or wherein the first gearbox comprises an epicyclic gearbox having input and output shafts in line with one another and a shaft line of the gas turbine system, and the output shaft is drivingly coupled to the first oxidant compressor.

3. The system of claim 1, comprising:

a stoichiometric combustion system having the turbine combustor configured to combust a fuel/oxidant mixture in a combustion equivalence ratio of between approximately 0.95 and 1.05 fuel to oxygen in the oxidant; and

a heat recovery steam generator (HRSG) coupled to the gas turbine system, wherein the HRSG is configured to generate steam by transferring heat from the exhaust gas to a feed water;

wherein the HRSG is fluidly coupled to a steam turbine generator comprising the steam turbine, the steam turbine is configured to drive the second oxidant compressor via the second gearbox, and wherein the EGR system is configured to route the exhaust gas from the turbine, through the HRSG, and back to the exhaust gas compressor; and

wherein the EGR system comprises:

a blower configured to motivate the exhaust gas toward the exhaust gas compressor;

a cooler configured to cool the exhaust gas; and

a moisture removal unit configured to remove moisture from the exhaust gas.

4. The system of claim 1, wherein the main oxidant compression system is configured to supply the compressed oxidant as atmospheric air, oxygen enriched air having between approximately 21% and 80% by volume oxygen, oxygen depleted air having between approximately 1% and 21% by volume oxygen, or substantially pure oxygen comprising greater than 80% by volume oxygen.