CLAIM

1. A method for cogenerating gas-steam based on gasification and methanation of biomass, the method comprising:

1) biomass gasification: drying, crushing and sorting rice straw, crop stalk and other biomass so as to produce biomass raw material with diameter or maximum length below 2 mm; sending the biomass raw material to high-temperature entrained flow bed gasifier directly via a screw feeder; mixing oxygen and water vapor produced from an air separation plant with biomass, transporting a resulting mixture via a nozzle to a gasifier, gasifying the biomass at a temperature of 1,500-1,800°C and a pressure of 1-3 MPa to yield crude gasified gas, and transporting superheated steam having a pressure of 5-6 MPa resulting from sensible heat recovery to a steam turbine;

2) shift and purification: according to demand for a methanation reaction, adjusting a hydrogen/carbon ratio of the crude gasified gas generated from step 1) to 3: 1 using a shift reaction, and eluting the crude gasified gas using low-temperature methanol for desulfurization and decarburization, whereby yield purified syngas;

3) methanation: introducing the purified syngas in step 2) to a methanation unit comprising a primary methanation unit and a secondary methanation unit, the primary methanation unit comprising a first primary methanation reactor and a second primary methanation reactor connected in series; allowing part of process gas from the second primary methanation reactor to return to an inlet of the first