

CLAIMS

1. A process for increasing process furnaces energy efficiency through gas turbine integration by using turbine exhaust gas, wherein a hydrocarbon feed is heated in a furnace, said process comprising the following steps:
 - i) feeding furnace combustion air to the burners of said furnace together with furnace fuel to provide high temperature heat to said furnace;
 - ii) cooling the hydrocarbon feed thus processed by using water from a steam drum under the formation of water vapour;
 - iii) returning the mixture of water and water vapour thus formed to said steam drum;
 - iv) withdrawing of saturated high-pressure steam from said steam drum and feeding said saturated high-pressure steam to a heat recovery unit;
 - v) feeding said turbine exhaust gas to said heat recovery unit for converting said high-pressure steam into super heated high pressure steam, thereby decoupling the gas turbine from the process furnace.
2. The process according to claim 1, wherein said furnace is chosen from the group of steam cracker furnace, propane dehydrogenation furnace and butane dehydrogenation furnace.
3. The process according to claim 2, wherein said furnace is a steam cracker furnace and wherein in step i) high temperature heat is provided to the radiant section of said cracking furnace for pyrolysis of the hydrocarbon feed present in said radiant section under cracking conditions.
4. The process according to any one or more of the preceding claims, further comprising preheating furnace combustion air through hot flue gasses from said furnace and/or hot flue gasses from said heat recovery unit.
5. The process according to any one or more of the preceding claims, further comprising preheating boiler water through hot flue gasses from said heat recovery unit and feeding the boiler feed water thus preheated to said steam drum.
6. The process according to any one or more of the preceding claims, further comprising preheating boiler water through hot flue gasses from a furnace and feeding the boiler feed water thus preheated to said steam drum.
7. The process according to any one or more of the preceding claims, wherein step ii) is carried out by using a transfer line exchanger (TLE).

8. The process according to any one or more of the preceding claims, wherein said heat recovery unit further comprises an evaporator and/or a steam generator.

9. The process according to any one or more of the preceding claims,
5 wherein said heat recovery unit comprises one or more duct burners for providing additionally heating capacity for providing super heated high pressure steam.

10. The process according to claim 9, further comprising one or more fresh air suppliers for providing air to said one or more burners.

11. The process according to any one or more of the preceding claims,
10 further comprising additionally one or more economizers, steam generators, steam drums and super heaters, operated at lower pressures to produce heat medium and/or low pressure steam.

12. The process according to any one or more of the preceding claims,
15 further comprising heating process liquids or gasses by feeding said process liquids or gasses to said heat recovery unit.