Miao Li et al., J Pet Environ Biotechnol 2014, 5:4
http://dx.doi.org/10.4172/2157-7463.S1.008

OMICS Group Conferences
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2nd World Congress on
Petrochemistry and Chemical Engineering
October 27-29, 2014 Embassy Suites Las Vegas, USA

Economic evaluation of natural-gas CCHP System-The case of China

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Combined cooling, heating and power (CCHP) system fueled by natural gas is expected to play an important role in the sustainable energy strategy. The numbers and capacity of power generation unit (PGU) areoptimized so as to minimize the annual total costs (ATC) through MINLP modelwith three scenarios. A numerical study of natural-gas CCHP systemfor a hotel in Dalian (China) is given to ascertain the effectiveness of the optimal method. The results show that with a single PGU, the trend of ATCS increases firstlywith the increasing of the capacity, reaches the maximum value, and then mostly decreases. Furthermore,with two units in parallel, when the major unit capacity is higher than the optimum value, its impact plays a dominant role on the ATCS. However, when the major unit is lower than the optimum value, the impact can be determined by the minor unit.

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