Taradon Piromchart 2013: Techno-Economic Design of Integrated Energy Recovery Process from LNG Receiving Terminal. Doctor of Engineering (Chemical Engineering), Major Field: Chemical Engineering, Department of Chemical Engineering. Thesis Advisor: Associate Professor Thongchai Srinophakun, Ph.D. 176 pages.

The study purposes the integrated system design of waste energy recovery from regasification unit in LNG receiving terminal to utilize this energy for the emission reduction; especially VOCs, in MTP and surrounding areas. The scope also covers the engineering design of pipeline and the route for waste gas, conceptual design of gas terminal and raw drinking water production by hydrocyclone and multi-stage filter.

The result shows that the proposed integrated system can reduce VOCs, sulphur compound and CO_2 at removal efficiency of 100.0, 96.5 and 55.9%; respectively. In addition, the VOCs content in treated gas is lower than the minimum international air pollution standard for acute, intermediate and chronic levels. The treated gas and by-product from the gas treatment system can be utilized as fuel gas for power generation and low quality fuel feedstock. The by-product from LNG regasification can be the raw drinking water with the combined technique of freeze desalination and reverse osmosis.

The economic evaluation shows that this integrated system is feasible in wide range of feed conditions. The system can operate with positive economic whether the waste gas feed available or not. The payback period of normal scenario is 1.45 years comparing to 1.50 years if there is no waste gas feed. In addition, the sensitivity analysis demonstrates that payback period is feasible in 10 years although under the extreme condition of price factors.

_____ _____ ___ / ___ / ___

Student's signature Thesis Advisor's signature