

## Potential of Employing PPA-Ended CCGT Power Plants in Thailand

Chira Achayuthakan  
EGAT, Nonthaburi, Thailand

Taweep Chaisomphop  
SIIT, TU, Pathumthani, Thailand

Pannathat Rojanamon  
EGAT, Nonthaburi, Thailand

Pradit Withisuphakorn  
NIDA, Bangkok, Thailand

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### Abstract

Currently Thailand electric supply industry (ESI) is *Enhanced Single Buyer*. Major trades of generating power are conducted through long-term power purchase agreement (PPA) based on two-part tariff: Availability Payment (AP) and Energy Payment (EP). To date, ones of the first PPAs are imminent to end; however, their generating capabilities are exploitable. Existing power plants are long comprehensively invested on fuel supply, water supply, and grid connection facilities, and essentially societal acceptance from communities. Decommission of those plants could waste those invested infrastructures. To the contrary, development for new facilities becomes more resisted due to NIMBY. This led to the study of potential of employing PPA-ended power plants. Scope of study lies to gas-fired combined cycle (CCGT), which dominate Thailand power generation. Although old power plants are commonly deficient respecting to heat rate, constituting to high EP, they hold many advantages. Their fixed costs, hence AP, can be avoided or deferred. This high EP and low AP can fit to system requirement serving intermediate load. Without legislative market to enter, such trades need extension of PPA; however tariff should be re-specified. Those extended power plants are proposed to operate with daily start-stop duty, to serve system intermediate load, complying with the rationale, according to merit order, that new power plants usually have better efficiency and deserve for base load. Unlike tender for new PPAs, competition to award PPA extension is depressed with small number of vintage competitors, and subjective to system operator's identification of tender size. The price-benchmarking is proposed to encourage competition. Bid from each PPA-ended power plant shall be competed with system value (PB1) and its own benchmarking price (PB2). The PB1 is derived using *Value of Deferral*— system cost difference between employing proxy and deferred power plants. And PB2 is composition of prudently justified AP and EP. The repayment for initial cost (AP1) for extended power plant covers cost of renovation, expected to be far lower than its original cost. The fixed operation and maintenance cost (AP2) is allowed to increase due to shorter cycle of major maintenance. Degradation of aging power plant undoubtedly deteriorates efficiency, allowing slightly increased EP. Technical and legislative aspects are assessed and prepared for implementation. In addition, any other ancillary services e.g. black start and maintenance rescheduling capabilities, or even build-operate-transfer (BOT) scheme, which are missed at present, can be included in the extended PPA.