

# Developing Trend of Domestic Electricity Tariffs in Great Britain

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*Abstract*- Household flat rate electricity tariffs have been ongoing for decades in the UK. The fitness of this type of tariffs is challenged in the new smart grid and smart metering environment, where demand responses are expected to play an important role to support the energy markets and the network. Generally speaking, most advanced electricity tariffs to date aim to reduce energy prices in a competitive electricity market. This paper reviews a range of electricity tariffs exercised by major suppliers in the UK and their associated drawbacks. The need for further development in electricity tariffs is analyzed with an aim to support suppliers undergoing innovations to provide various tariffs for different types of customers to maximize their participations.

*Index Terms*-- dynamic pricing, tariff design, domestic tariff, demand response, smart metering

## I. INTRODUCTION

Household tariffs are set based on 8 classic customer patterns [1] developed in 1960s. The tariffs reflect the total cost of energy generation, transmission, distribution and supply. These patterns and their respective customer volume are generally used for settlement and tariffs. At present, neither time-of-day nor time-of-year tariffs has been widely used in Great Britain, the vast majority of consumers purchase their electricity from suppliers at flat rate tariffs, with no price variations throughout the day and throughout the year.

So far, two types of flat rate tariffs are provided to domestic consumers:

### A. Standing-charge tariffs

A standing charge is a fixed amount of cost paid annually to electricity suppliers. The costs of meter reading, maintenance, network connection and energy cost are all included in it. Then, the actual consumption is charged at a fixed unit price. The annual standing charge is averaged at £54.35 across the GB's 6 suppliers [2].

### B. Two-tier tariffs

Consumers under this tariff are subject to two tier unit prices, where the fixed cost is thus built into the unit rate instead of a stand-alone charge.

Tier 1 unit price is applied to the first block of consumers' energy use, recovering the suppliers' fixed cost. Tier 2 unit

price is applied to electricity usage at and above the first tier of consumption, recovering suppliers' total operational costs. Generally speaking, Tier 1 unit price is higher than that of Tier 2. On average, Tier 1 and Tier 2 unit charges are 17.06p and 12.46p respectively. For households with average consumptions, the first threshold accounts for 768 kWh [3]. Between the two types of tariffs, Two-tier tariffs account for 65 percent of the total population.

In addition to flat rate tariffs, all suppliers offer Economic 7[4] or Economic 10 [5] tariffs which have significantly less customer volume of around 9.7%. These tariffs introduce cheaper night or afternoon rate in order to shift load from peak to tough time, thus reducing energy consumption during peak period. The "seven" in the definition means 7 hours of lower rate electricity, and the time period of the economic rate may slightly differ from one supplier to another, by large they are between 10pm and 8 am. EDF, E.On and SSE also introduced 3 more hours with cheaper rate during afternoon between 12-4pm, in addition to the 7 hours with lower rate between 7pm and 5am. Therefore, the 10 low-rate hours are usually reflected as Economy 10.

Economy 7 and Economy 10, representing the simplest Time of use (TOU) products, have attracted residential consumers who have electrical storage heaters.

## II. CURRENT ELECTRICITY PRICES TARIFFS REVIEW

Nowadays, in addition to the standing charge tariff and the two-tire tariff, a range of energy products based on flat rate are supplied by large energy companies in retail market to mass consumers. In this section, we will discuss how these tariffs provided by different suppliers benefit consumers and what consumers are encouraged to do so that their energy saving plan could have a noticeable effect. The portfolio of energy products from three electricity suppliers will be described in the following paragraphs.

### A. Southern Electric

#### ✧ 1. Review of tariffs

A tariff with a distinguishing feature in Southern Electric(SE) is named "**Batter plan**"[6]. The chief aim of the product is to reduce energy consumption together with protecting the environment. Once the consumption decreases below 90% of usual household usage, the tariff is geared for providing customers a cash credit reward of £15. As an online account with paperless billing, **Go direct** [7] is managed through internet and paid via direct debit. However, there is an

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