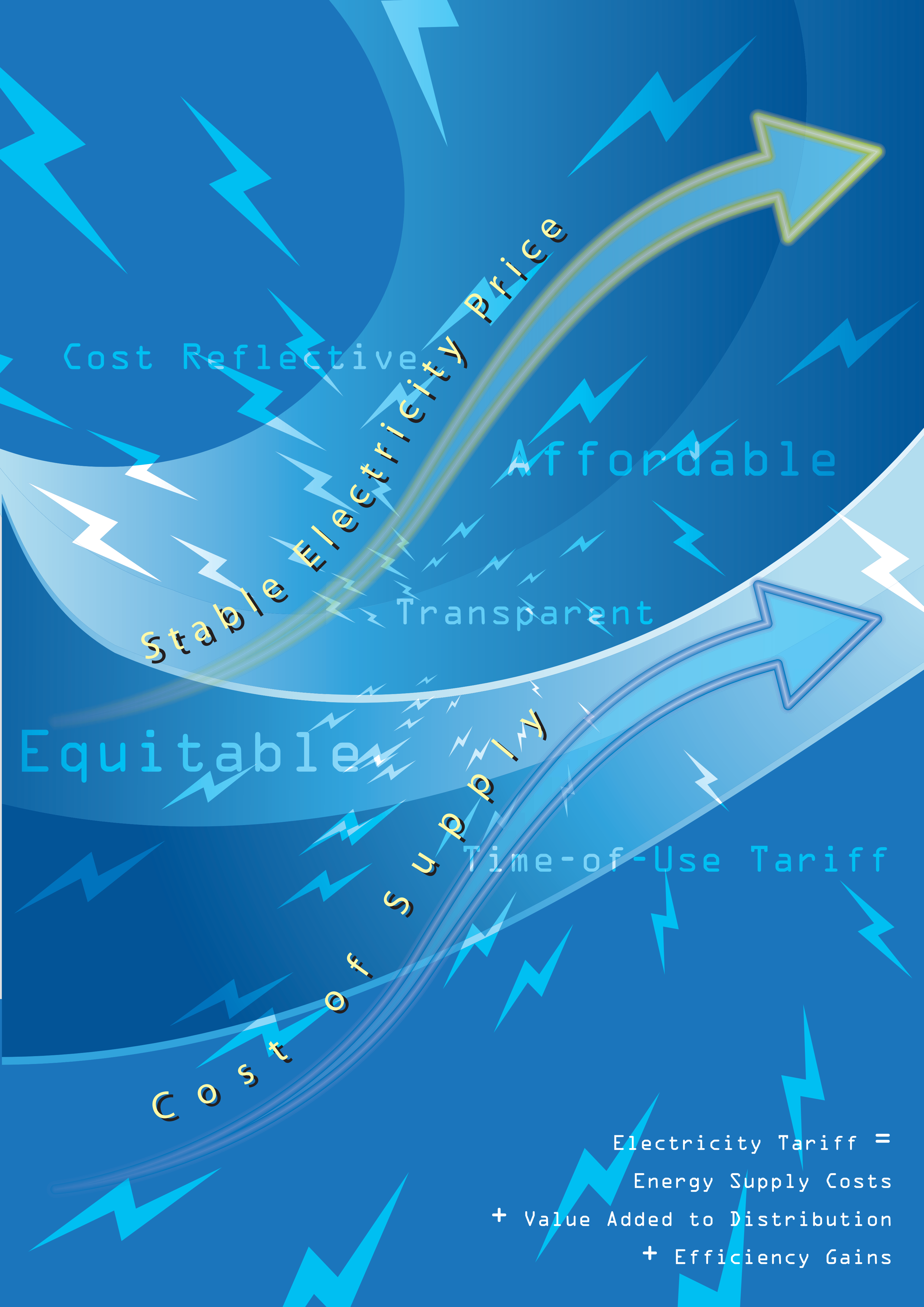
Stable Electricity Price
Cost Reflective
Affordable
Transparent
Equitable
Cost of Supply
Time-of-Use Tariff
Electricity Tariff =
Energy Supply Costs
+ Value Added to Distribution
+ Efficiency Gains

Why Cost Reflective Electricity Tariff?

Fairness, Transparency, Equity, Efficiency and Affordability are the key features of a modern Electricity Tariff Structure. These characteristics are embedded in cost-reflective electricity tariffs.

CEB, in fulfilling its strategic role, shall consider the implementation of a cost-reflective tariff structure with the support of all its stakeholders!

ELECTRICITY TARIFF IN PERSPECTIVE

Chapter 10

Given the substantial investment that will be required to support the implementation of the projects mentioned in this IEP, CEB will need to explore all possible avenues so as to raise the necessary financial resources. Increasing financial resources usually means higher financial obligations for the CEB. In meeting future financial obligations, CEB will inevitably depend in a large measure on the electricity tariff, which is its **main**, not to say sole, **source of revenue**.

Over the years, the electricity tariff in Mauritius has evolved in an apparently haphazard manner. Today, there are twenty-two types of tariffs in the CEB's tariff schedule.

Although the different available tariffs are not overly complex, there are, however, some inherent weaknesses in their structures, and some are even duplicative in nature. The most important weaknesses of the present electricity tariffs are that they are **not cost-reflective** and consist of a substantial amount of *cross-subsidisation**.

In general, for electricity pricing model to be characteristically in line with international best practices, it should embrace, *inter alia*, the objectives based on the associated guidelines as elaborated in Table 10.1 below.

CEB had recognised that there were a number of weaknesses embedded in its electricity-pricing structure. A study was even carried out to resolve the inherent weaknesses. A number of changes were recommended.

However, it was acknowledged that the recommended changes should be implemented in harmony with the prevailing social and economic conditions so as to prevent potential tariff shocks. A tariff shock is a situation where significant adjustments are made to the applicable electricity tariffs, which seriously affect electricity end-users' budgets.

The very absence of an effective tariff structure in our context thwarts, to some extent, the implementation of important actions, which can bring up substantial efficiency gains for the benefits of all electricity end-users. For instance, the benefits of implementing Time-Of-Use (TOU) tariff and quarterly billing, among others, cannot be reaped, unless the current electricity tariffs are properly restructured and implemented. In the next section, an overview of a proposed typical cost-reflective tariff model, workable for Mauritius and Rodrigues, is presented.

TABLE 10.1: Objectives and Guidelines for Electricity Pricing model

Objectives	Guidelines
Encourage national economic growth by • Efficient allocation of national resources • Electricity priced for efficient usage	Price according to cost • With due regard to economic efficiency • To foster efficient and deter wasteful use of electricity
Ensure ceb is kept financially viable	Encourage commercial practices at CEB
Ensure customers are treated equitably	Price according to cost • Offer life-line provisions for qualifying customers • Eliminate improper subsidies
Achieve simplicity and stability in pricing	Keep structure simple and comprehensible

* *See glossary*

10.1 OVERVIEW OF A PROPOSED COST-REFLECTIVE TARIFF MODEL

In 2008, assisted by an internationally-known consultant, CEB worked out a restructuring of the electricity tariffs - implementation of which is still pending - with the aim of streamlining the current tariff structure into a modern one. The restructured tariff model, if implemented, would have been in line with best international practices.

The main objectives of the CEB tariff restructuring, among other things, would have been to make the electricity tariffs cost-reflective across different sectors. The new tariff model would have included an indexation mechanism so as to prevent future tariff shocks, and would have enabled CEB to offer Time-Of-Use options.

In short, the implementation of the new tariff model would have further enforced the principles of fairness, equity and transparency in CEB's electricity price and rates-setting. In the following sub-sections, a few salient features of the proposed tariff model are given.

10.1.1 The Tariff Development Methodology

Every tariff structure is built on a central revenue requirement methodology (rate of return, revenue-cap, price-cap, hybrid method, etc.). In the local context, CEB, in the interest of all stakeholders, will adopt a **Cost of Service** paradigm.

Under this approach, all costs incurred, from production to delivery points, including service costs, are apportioned to each business unit. Thereafter, where applicable, the costs are further apportioned at different voltage level. Subsequently, the costs are allocated effectively to each customer category.

Finally, the apportioned costs are translated into the unitary rates applicable to each tariff, hence making the applicable tariff totally cost-reflective. Unlike the present tariffs, in the proposed tariffs each customer will be charged the real costs that it provokes, while demanding electrical power and energy.

Through this approach, customers are given the assurance that the necessary and proper discrimination is made so as to differentiate the service conditions that each customer category creates by virtue of their supply requirements.

In simple terms, the electricity rates applicable to each customer category will vary, depending on the supply point (HV, MV, LV) and the Time-Of-Use (TOU), wherever appropriate.

10.1.2 The General Tariff Formula & Tariff Components

Basically, the proposed unbundled tariff will have two components: The first will cater for the electricity generation, energy purchase and transmission costs, and the second will cover the distribution costs, inclusive of the value added service costs, as shown in the formula below.

Unit Tariff Price = Unit Energy Supply Cost (ESC) + Unit Distribution and Value Added Cost (VAD)

10.1.3 Demand and Energy Losses

In addition to the Energy Supply Costs (ESC) and Value Added to Distribution (VAD) costs, both demand and energy losses will be estimated and treated as cost elements. Thereafter, these costs will be embedded into the energy charge, which will then be transferred to the tariffs.

As for the VAD costs allocation, the allocation of losses to each customer category will be dependent on the typical demand profile of the customer category.

10.1.4 Tariff Categories

Implementation of the new tariff structure will call for a re-categorisation of the existing customers into different tariff categories.

10.1.5 Tariff Model

To implement the cost-reflective tariff structure, a tariff calculation model, as an essential tool, will be regularly used to determine:

- The revenue requirements;
- The cost-reflective real rates, as a result of changes in market forces;
- The variances between the actual applicable rates and the real rates; and
- The cash flows for a period of 4 to 5 years.

10.1.6 Automatic Price Review (APR) Mechanism

To ensure tariff stability, it is recommended that a full tariff review be carried out at the end of the *Multi-Year Regulatory Period (MYRP)**, where amendments to the tariff structure itself and adjustments to the asset base can be made.

To prevent tariff shock at the end of the MYRP and to account for incremental evolution of energy costs, an APR mechanism is usually necessary. The APR, on a quarterly basis, enables a review of energy rates based on indices, such as CPI, Wages index, Producer Price Index, etc. The APR mechanism is an in-built functionality in the tariff calculation model.

10.2 IMPLEMENTATION ISSUES

Above all, the implementation of a restructured tariff model is to prevent any tariff increase; thus aiming at revenue neutrality. In reality, this is difficult and by default, there may be some collateral impact on some customer sub-categories. For example, in our case, subsidised (preferential) tariffs, such as the EPZ tariffs, will be automatically phased out upon the implementation. This may lead to tariff adjustment(s) of customers benefitting from the EPZ tariffs.

To avoid potential *tariff shock**, it is advisable to stagger the implementation of the cost-reflective tariff regime over a defined time period, and, here, a two-step implementation approach is suggested. The first step is to implement the structure with revenue neutral objective and the second step is the transition from actual level of revenue to a cost-reflective regime.

The implementation of the new tariff structure will also entail investments in a new metering system. CEB is already investing in such metering technology for other purposes, as discussed in the next section.

10.3 METERING

Electric meters are unquestionably important - not to say one of the most vital - pieces of asset in a power system. Meters are the links which connect the customers with the utility. They provide essential information to both parties. Enhancement in the metering system gives a cutting edge, in terms of benefits, to a utility and its electricity customers; such as:

- providing consumers with real-time information on the electricity bill; hence they can better control their consumptions;
- providing time of use features, whereby consumers can benefit from lower rates during off-peak hours;
- encouraging efficient use of renewable sources of energy in relation to a demand response program;
- enabling efficient management of cost-reflective tariffs;
- providing built-in anti-theft mechanisms to track down fraudulent consumptions;
- enabling load sharing and *load management** by limiting user consumption;
- enabling automatic connection/disconnection of electricity supply; and
- reducing operation cost, for example, by decreasing the time taken for bill settlement, which in turn improves the working capital ratio.

Above all, an advanced metering system allows the gathering of significant intelligence about the market.

Over the years, CEB has heavily invested in improving its Metering System. In the deployment of its Metering Strategy, CEB has been gradually moving away from the utilization of electro-mechanical meters, through the installation of electronic meters and, modestly, smart meters. Figures 10.1(a) and 10.1(b) on the next page show the evolution of the penetration of electronic meters, in the CEB's power system, in comparison to the number of installed electro-mechanical meters.

In moving forward with the strategy, while adopting a systematic approach, CEB had already embarked on the next phase of its metering installation enhancement programme. As at today, major customers, categorised under CEB's ledger billing system, have been already transferred to the so-called Automatic Meter Reading (AMR) platform. This is a critical step towards the development of an Advanced Metering Infrastructure (AMI), which CEB is ultimately aiming at in the long run so as to modernise the national power system.

AMI provides state-of-the-art technology, which consists of smart meters, a communication system and meter data management software. Despite its numerous attractive advantages, however, there is one major barrier to its widespread implementation, which is the huge investment required.

** See glossary*

FIGURE 10.1 (a): Trend in Number of Electro-Mechanical Meters Installed

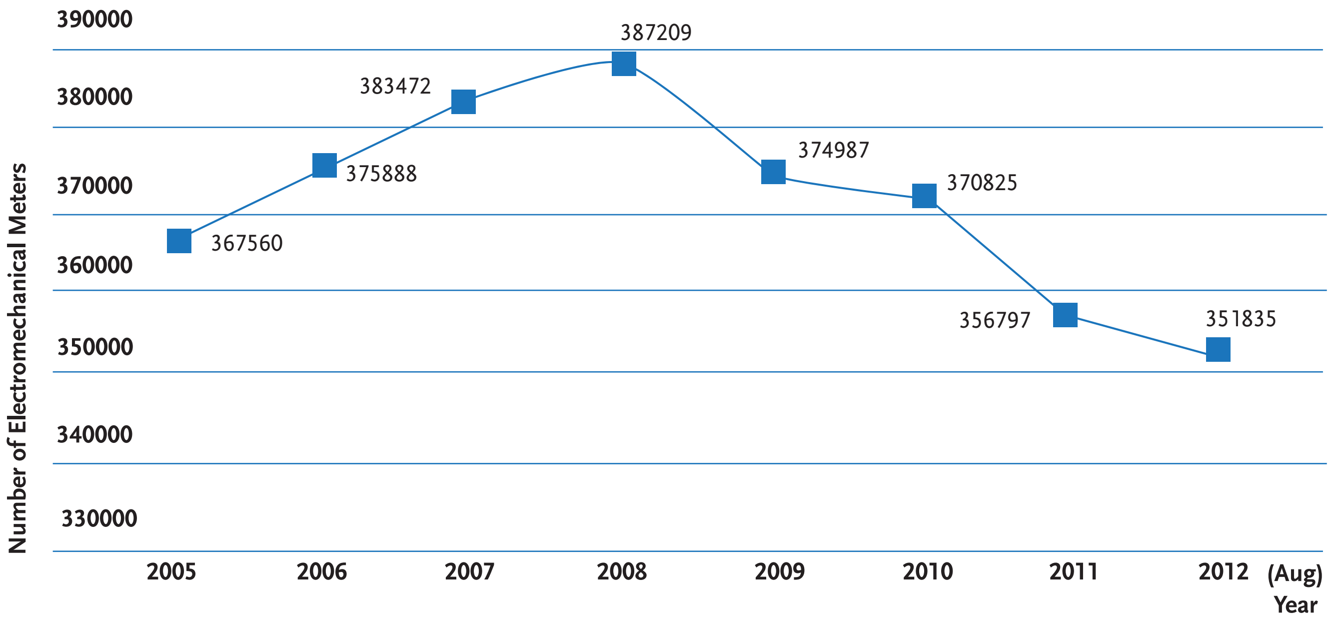

FIGURE 10.1 (b): Trend in Number of Electronic Meters Installed