

**Economic Concepts of Efficiency and
The Role of Price Signals in Achieving Efficiency**

Part of the rationale for creating competitive energy markets in Ontario was to improve efficiency in the electricity sector. When we evaluate market evolution proposals, improved market efficiency is a key aspect in the decision making process. It is important that the IESO and stakeholders have a common understanding of efficiency when discussing the market and its evolution.

There are three key concepts of efficiency that are relevant to the electricity industry:

- (i) Productive Efficiency
- (ii) Allocative Efficiency
- (iii) Dynamic Efficiency

It is proposed that the Market Pricing Working Group adopt the following working definitions for each of these efficiency concepts.

1. Productive Efficiency

Productive efficiency is defined as using the least amount of resources to produce a given good or service. In other words, output is being produced at the lowest possible unit cost.

Productive efficiency implies firms are using:

- The least costly labour capital and land inputs;
- The best available technology;
- The best production processes;
- Exploiting all potential economies of scale; and
- Minimize the wastage of resources in their production processes

2. Allocative Efficiency¹

Allocative efficiency is the market condition whereby resources are allocated in a way that maximizes the net benefit attained through their use. A market will be allocatively efficient if:

- (1) Output is produced by the lowest cost producers
- (2) Output is consumed by those most willing to pay for it and only when its value to the consumer is at least as great as the incremental cost of its production

¹ Allocative efficiency is also sometime referred to as static efficiency or short-term efficiency.

3. Dynamic Efficiency

Time is the central difference between allocative and dynamic efficiency. Allocative efficiency deals with the most efficient use of resources at a given point in time. Dynamic efficiency on the other hand deals with the evolution of a more efficient mix of resources for the market over time.

Dynamic efficiency relates to efficient technology choice and timely and efficient capacity investment decisions both on the supply side and the demand side of the industry.

Dynamic efficiency requires that proper incentives exist to make long-term decisions, such as those about investment and the introduction of new products and services. Dynamic efficiency also requires that the effects of decisions in one period be taken into account for future periods.

Efficiency and the Role of Price Signals

In a market context, price signals direct the decisions of the diverse set of suppliers and consumers. The individual decisions of these participants determine the eventual market outcome and hence the efficiency of this outcome. Efficient outcomes are more likely when the price signals directing the suppliers' and consumers' decisions:

- accurately reflect the incremental cost of supplying another MW of energy or the incremental benefit from consuming another MW of energy, and
- can be reasonably predicted and are known by both suppliers and consumers, who are then able to respond to them.