

## Neel Somani Explains the Fundamentals of Power Market Pricing

A clear introduction to how electricity markets determine prices and why the final megawatt sets the cost for everyone



**San Francisco, California Mar 13, 2026 ([IssueWire.com](https://www.IssueWire.com)) - Understanding the Structure of Power Markets**

Energy markets often appear mysterious to people outside the industry. Prices can change quickly, headlines reference shortages or surpluses, and the mechanisms that determine electricity costs rarely receive clear explanation. In a recent educational discussion, [Neel Somani](#) outlined a simplified framework for understanding how power markets operate in the United States.

The goal of this explanation is not to replicate the complexity used by professional trading desks. Instead, it provides a conceptual foundation that helps observers understand why electricity prices behave the way they do. According to Neel Somani, grasping a few core ideas can place someone

ahead of the majority of casual conversations about energy markets.

At the center of the explanation is a straightforward principle. Electricity markets are coordinated systems designed to match supply and demand while producing a price that reflects the cost of the final unit of power required to keep the system running.

## **The Role of Grid Operators**

Electricity markets in the United States are not managed by a single nationwide entity. Instead, they are organized through regional grid operators known as Independent System Operators and Regional Transmission Organizations. These institutions coordinate the flow of electricity across large geographic areas.

Neel Somani describes these organizations as central clearing authorities for power markets. Their job is to collect information from electricity suppliers, estimate how much power consumers will need, and determine which generators should operate at any given moment.

Generators submit offers describing how much electricity they are willing to produce and at what price. At the same time, system operators estimate total demand based on historical patterns, weather forecasts, and other variables that influence electricity usage.

Once this information is gathered, the operator calculates the most economically efficient way to meet demand. The result is a market price for electricity that reflects the cost required to keep supply and demand in balance.

Neel Somani emphasizes that this process is designed to produce an efficient outcome. While the underlying algorithms can be complex, the goal is simple: deliver reliable electricity at the lowest feasible cost while maintaining system stability.

## **Thinking About the Cost of Electricity**

One of the most useful mental models for understanding electricity pricing is the concept of ordered generation. In simplified terms, power plants are used according to their cost of production.

Neel Somani explains that the system tends to select the cheapest sources of electricity first. Renewable energy sources such as wind and solar typically have very low operating costs once they are built. Because of this, they are often dispatched before other types of generation.

After renewable resources are utilized, the system moves to the next cheapest sources of power. These can include natural gas plants, coal facilities, and other forms of generation depending on the region. Each additional unit of electricity is supplied by progressively more expensive generators.

This simplified ordering is commonly called the merit order of generation. It reflects how the grid prioritizes power plants according to the cost of producing electricity.

## **The Importance of Transmission Constraints**

Although the merit order provides a helpful framework, the real system contains additional complexities. Electricity must travel through transmission lines to reach consumers, and these lines have physical limits.

Neel Somani notes that sometimes electricity could be produced cheaply in one location but cannot be delivered elsewhere because the transmission system has reached its limit. When that happens, local generators must step in even if they are more expensive.

Transmission congestion therefore introduces regional differences in electricity pricing. Two locations that are geographically close may still experience different prices if the grid cannot move additional power between them.

This constraint highlights the physical reality of electricity markets. Unlike many commodities, electricity must be consumed at the exact moment it is produced, and the infrastructure that delivers it plays a crucial role in determining cost.

### **Why the Last Megawatt Sets the Price**

Perhaps the most important concept in electricity markets involves how prices are actually determined. The price paid by consumers is not based on the average cost of all electricity produced. Instead, it reflects the cost of the final unit needed to meet demand.

Neel Somani describes this concept using a simple example. Imagine a system where the first thousand megawatts of electricity come from renewable sources with extremely low production costs. After those sources are fully utilized, an additional generator must be activated to supply the final megawatt required by the grid.

If that last generator produces electricity at a significantly higher cost, the price for the entire market will reflect that cost. Every generator that participates in the market receives the same price, even if some of them were able to produce electricity much more cheaply.

At first glance this outcome may appear counterintuitive. However, Neel Somani points out that this structure encourages efficiency. It rewards generators that can produce electricity at lower cost while ensuring that enough capacity is available when demand rises.

### **Economic Efficiency in Electricity Pricing**

The mechanism in which the final megawatt determines the market price is known as marginal pricing. In economic theory, marginal pricing allows markets to allocate resources efficiently because the price reflects the cost of the next unit required.

Neel Somani explains that this method ensures the grid always calls on the least expensive available generators before turning to more costly ones. Over time, it also encourages investment in generation technologies that can provide electricity at lower cost.

In practice, marginal pricing helps maintain reliability while sending signals to market participants about the value of electricity during different periods. When demand is high and more expensive generators are required, prices rise. When demand is lower and cheaper generators can meet the system's needs, prices fall.

### **The Interaction Between Renewables and Conventional Generation**

The growth of renewable energy has introduced new dynamics into electricity markets. Wind and solar power often produce electricity at very low marginal cost, which means they tend to enter the dispatch

order early.

Neel Somani notes that this can lower average prices during periods of strong renewable generation. However, the system still relies on dispatchable resources such as natural gas plants to maintain reliability when renewable output declines.

Because electricity demand continues even when the sun sets or the wind slows, flexible generation remains essential. The relationship between renewables and conventional plants therefore plays a major role in shaping modern electricity pricing patterns.

Understanding this interaction helps explain why electricity prices can vary dramatically throughout the day. Periods of strong renewable generation may produce lower prices, while times of peak demand can require more expensive resources.

## **A Starting Point for Understanding Energy Markets**

The simplified framework outlined by Neel Somani serves as an introduction to the mechanics of electricity markets. While professional analysts incorporate far more detailed data, the underlying principles remain consistent.

Grid operators collect supply offers and demand forecasts, the system prioritizes cheaper generation first, and the cost of the final megawatt determines the market price. These core ideas provide a foundation for understanding how electricity markets function.

Neel Somani frequently emphasizes that complex systems often become easier to understand once the key principles are identified. By focusing on the structure of the market rather than its many technical details, observers can develop a clearer picture of why electricity prices behave the way they do.

## **Encouraging Broader Energy Literacy**

As electricity systems evolve and renewable energy becomes more widespread, public understanding of energy markets is increasingly important. Many policy discussions revolve around electricity costs, grid reliability, and the transition to cleaner power sources.

By explaining these concepts in accessible terms, Neel Somani contributes to a broader conversation about how modern energy systems operate. Simplified explanations can help bridge the gap between technical market structures and everyday understanding.

For those interested in energy markets, the concepts discussed here provide a useful starting point. They highlight how supply, demand, and marginal pricing combine to shape the cost of electricity across the grid.

As more people explore these ideas, the mechanics of electricity markets become less opaque and more approachable. Through clear explanations of foundational principles, [Neel Somani](#) continues to encourage curiosity about the economic systems that power modern life.

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