

# ASSETS TO ACCESS: THE NEW ECONOMICS OF SERVICE AND AVAILABILITY

## Abstract

It is rightly said that only constant thing is change and you have to accept the challenge of change if you want to be at top or a performer to be recon with. Like other sectors, power sector is also going through lots of changes in revenue model, shifting from traditional model- capital expenditure or Capex model to Opex or O&M based model. The very concept is mainly taken from aerospace business model where revenue is based on performance and largely describe as “Power by Hour model”

The critical evaluation of this model reveals that the present day power sector business scenario is by and large depend on availability based tariff model, market based contracts and focused area renewable speeding up. Though OPEX model may come with improvement in efficiency, allocation of risks involved and with flexibility yet it has inherent challenges such as dependency risk of longer duration, complex contractual terms and conditions.

## Introduction

If we talk about historical power sector business model, it was heavily been dependent on high capital investment where industry has to invest lots of capital on infrastructure development like power generation plant including coal handling plants, ash handling plant, Merry Go Round(MGR), making arrangement for transmission lines with assurance for distribution networks. The high investment is getting recovered over a very long gestation or recovery period under regulated tariff model. The dominance of such model was prevailing in



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countries like India for a longer time.

Nonetheless, with the momentum of other source of power generation like green energy, market driven reforms and decentralisation in system has worked as a catalyst to shift towards perpetual or recurring cost concept where customers will be paying primarily for availability of power, reliable service provided and generation received rather than to become owner of entire assets. This is paradigm shift and converted it to “Power by the hour model”.

## Blueprint of Framework: CAPEX vs OPEX Models

### 1. CAPEX-Based Model

In the CAPEX model:

- ⊙ Focus mainly for long term invest with gradual reduction in operational cost in infrastructure.
- ⊙ Recovery of capital investment through long term usage or tariff.
- ⊙ Investor will be the owner.

This model in turn ensures:

- ⊙ Control over assets.
- ⊙ Return on capital invested is assured.
- ⊙ Stability for longer period.

Nevertheless, this model has constraint such as:

- ⊙ High Capital intensive project model.
- ⊙ Too much dependency on proprietary concept.
- ⊙ Bottleneck of operational management.

## 2. OPEX-Based Model

On the other side, the OPEX based model permit users to use electricity as a service, without being owner of the plant or assets.

The best suited model of this concept is under solar OPEX /O&M models where:

- ⊙ The plant is constructed and operated by third party.
- ⊙ The electricity bill is based on consumption by customer with incentive for higher consumption.
- ⊙ Risk management profile along with maintenance is shifted to the developer and user need not bother for that.
- ⊙ This model eliminates upfront investment and allows firms to use power rather than being the owner of the plant. Enjoy without being owner.

## Emergence of “Power by the Hour” in the Power Sector

The concept of “Power by the Hour” in electricity generation unmistakable as:

- ⊙ Recognise revenue based on availability. Availability.
- ⊙ Reliable pricing model.
- ⊙ Performance-based contracts.
- ⊙ Energy-as-a-service.

In India, the Availability-Based Tariff (ABT) system demonstrate this shift. Under Availability Based Tariff:

- ⊙ Electricity Generators are paid for Plant Availability Factor(PLF), not just for energy supplied.
- ⊙ Incentives and penalties are linked to performance and grid discipline through Deviation Settlement Mechanism (DSM).

This transforms electricity industry from a

commodity into a reliability service.

## Development of Revenue Models in the Indian Power Sector

### 1. Conventional Power Purchase Agreements (PPAs)

Historically, long-term Power Purchase Agreements (PPAs) dominated the sector. These contracts:

- ⊙ Reduction in market driven risks.
- ⊙ Locked capacity for almost 25 years
- ⊙ Confirmed assurance for fixed returns.

However, these factors leads to rigidity and poor performance. Generators are now increasingly reluctant to enter long-term PPAs due to surplus capacity and price fluctuations.

### 2. Shift to Market-Based and Flexible Contracts

As compare to conventional power business scenario, modern power sector markets are developing toward:

- ⊙ Short-term and medium-term contracts model focusing on O&M activities or coverage.
- ⊙ Real-time electricity market segments
- ⊙ Leveraged financial derivatives by way of Contracts for Difference.
- ⊙ Revenue-sharing agreements between parties involved.

These models primarily aim to improve efficiency and adaptability while addressing price volatility into consideration.

## Availability-Based Revenue Models: A Paradigm Shift

Availability-based contracts fundamentally alter incentives.

Traditional PPAs:

- ⊙ Pay fixed costs regardless of actual performance.

Modern contracts:

- ⊙ Link revenue directly to availability and responsiveness .

For instance:

- ⊙ Generators may receive availability based payment but face penalties in the form of DSM charges for outages
- ⊙ Financially settled contracts incentivize operation during scarcity periods

This aligns revenue with system reliability, not just production.

### Case Studies: Power Sector PSUs

#### 1. Power Grid Corporation of India

As India's central transmission utility, Power Grid operates under a regulated model but increasingly integrates availability-linked revenue mechanisms.

- ⊙ Revenue depends on network availability and reliability.
- ⊙ Incentives are tied to grid performance.
- ⊙ Investments are shifting toward smart grids and digital monitoring.

This reflects a transition from:

“Building transmission assets” → “Providing transmission reliability as a service”

#### 2. NTPC

NTPC, India's largest power generator, historically relied on cost-plus CAPEX models. However:

- ⊙ It is expanding its arm into renewable energy under OPEX structures.
- ⊙ Engaging in energy-as-a-service offerings.
- ⊙ Participating in market-based dispatch mechanisms.

This hybrid approach reflects the gradual transition from ownership to service orientation.

### Case Studies: Private Sector Leaders

#### 1. Tata Power

Tata Power has aggressively adopted OPEX models:

- ⊙ Solar rooftop solutions under OPEX.
- ⊙ Electric Vehicle(EV) charging infrastructure as a service provider.

- ⊙ solutions for Distributed energy.

These models:

- ⊙ Bring down customer CAPEX burden
- ⊙ Deliver recurring cash flows and proceeds.

#### 2. Adani Power

Adani Power operates primarily under PPAs but is adapting to:

- ⊙ Spot price exposure.
- ⊙ Flexible contract mechanism.
- ⊙ Blending with renewable assets

This indicates a gradual shift toward market-linked revenue models rather than traditional Power Purchas Agreement(PPA) model.

#### 3. ReNew Energy Global

A leading renewable energy firm, ReNew exemplifies the OPEX model:

- ⊙ Builds and operates renewable assets
- ⊙ Sells power under long-term and hybrid contracts
- ⊙ Focuses on performance-based returns

Its model aligns closely with “Power by the Hour” principles.

### Advantages of OPEX and Availability-Based Models

#### 1. Improved Capital Efficiency

OPEX models reduce the need for large upfront investments, freeing capital for other core activities.

#### 2. Risk Transfer

Operational and performance risks shift from consumers to service providers at large.

#### 3. Flexibility

Shorter contracts and market-based pricing allow adaptation to changing demand and technology.

#### 4. Incentivized Performance

Availability-linked payments ensure higher reliability and efficiency.

## Challenges and Risks

### 1. Contractual Complexity

OPEX models require complex contracts with clear risk allocation.

### 2. Revenue Uncertainty

Market-linked pricing introduces volatility compared to fixed PPAs.

### 3. Dependency Risks

Consumers may become dependent on service providers for critical infrastructure resulting reduced competition and encouragement to monopolistic pricing.

### 4. Regulatory Challenges

Transitioning from regulated tariffs to market-based systems requires policy support and standardization which is always supported by decision makers.

## Broader Implications for the Power Sector

The shift toward service-based models reflects deeper structural changes:

- ⊙ Transition to renewable energy from fossils fuels.
- ⊙ Decentralization of power generation by shifting large central power plants to local or smaller sources.
- ⊙ Digitalization and smart grids.

The power sector is evolving from:

Infrastructure-heavy utility model to Platform-based service ecosystem

## Critical Opinion

While the shift to OPEX and availability-based models is often celebrated as a sign of modernization, it is important to adopt a balanced perspective.

On one hand:

- ⊙ These models enhance efficiency and align incentives.
- ⊙ They reduce financial barriers and provide easy access.

On the other hand:

- ⊙ They may finance the power sector, prioritizing short-term returns.
- ⊙ Too much dependency on private sector may compromise energy independence.
- ⊙ Complicated agreements may lead to penalising smaller contractors. may disadvantage smaller consumers.

Thus, the transition is not merely technological but institutional.

## Conclusion and Concluding Remarks

The evolution of revenue models in the power sector—from CAPEX-driven ownership to OPEX-based service and availability frameworks—marks a fundamental shift in how electricity is generated, transmitted, and commercialised. The “Power by the Hour” paradigm reflects a broader transformation toward performance-based economics, where reliability and efficiency take precedence over asset ownership.

Examples from PSUs alongside private players such as Tata Power and ReNew Energy Global, demonstrate that this transition is already underway.

However, the shift is not without challenges. While OPEX models promise flexibility, increased efficiency, and so called Tadka of innovation, they also introduce new risks related to contract design, market volatility, and dependency structures. Policymakers must ensure that this transition is accompanied by robust regulatory frameworks, transparency, and equitable access for all the parties involved.

To conclude, the “Power by the Hour” era represents not just a change in revenue models but a redefinition of the power sector itself. The future will likely be characterized by hybrid systems combining CAPEX and OPEX elements, where the ultimate goal is not merely electricity generation, but the delivery of reliable, sustainable, and affordable energy as a service for mankind. MA

## References

1. *Science Direct Journal.*
2. *Journal Research Gate.*
3. *Energy Policy.*