

# **Markets as an Enabler for India's Energy Sector**

**Input to NITI Aayog towards formulating the National Energy Policy (NEP)**

**Submitted by**



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## Background

In order to facilitate the framing of the National Energy Policy (NEP), NITI Aayog has been undertaking consultations to identify enablers for the development of the energy sector in India. Shakti Sustainable Energy Foundation (SSEF or Shakti) has been tasked to assist in the consultations on “Energy Markets” as an enabler for development and operations of the energy sector. As part of this consultation, an industry roundtable was organized on Monday, 19<sup>th</sup> October 2015 to understand and deliberate upon some of the key requisites and principles for market operations, its implications on the sector as a whole, benefits and risks of the proposed concept. The aim of the roundtable was to validate the hypothesis that deeper markets in energy are indeed required for more comprehensive energy sector development in the country. A background note was circulated (Annex 1) and a discussion presentation (Annex 2) was made highlighting the need for energy markets, challenges in the current context and suggestion for future preparedness. This note characterizes short term competitive “multi-buyer, multi-seller” arrangements on trading platforms that lead to transparent ongoing price discovery as a “market”.

The concept of energy markets was seen by the participants as a necessary move towards energy sector development and its efficient operations. The discussions reinforced the need and efficacy of energy markets as an integrator in the increasingly larger and complex energy sector. However, certain practical issues such as the current infrastructure development practices and contractual mechanisms were seen as major bottlenecks for development of markets.

The energy sector in recent years has seen a move from allocations to auctions and then towards markets based mechanisms. However, the move to market based mechanisms has been slow to take off and is also not uniform in the various resource segments like coal, oil and gas and power. In recent years the long term contracts awarded in these sectors through auctions have faced various unforeseen challenges. By nature, long term auctions for commodity and infrastructure are supposed to help creation of infrastructure, they inevitably causes rigidities, which make the economy uncompetitive and inflexible. Market mechanisms can help address some of the rigidities that emanate out of auction processes that the Indian energy sector (and the broader infrastructure sector) has adopted in recent periods for long term high cost projects.

Even as markets can help, there are inevitable complexities and thus the development and operations of the markets need to be guided by certain core principles. The group recommended that the following “Key Principles” be considered for this purpose. Further, the group also discussed the processes that would need to be followed to achieve the principles, and different options on how the transition can be implemented efficiently.

## **Key Principles for consideration in NEP formulation**

The suggested themes/principles are as follows:

### **A. Enabling Competition**

The forum opined that significant benefits can accrue with competition that market operations entail. Accordingly conditions need to be created to ensure that there is adequate competition and anti-competitive behaviour is penalized. Technology advancements have made more flexible market operations and also its surveillance possible, and same need to be suitably incorporated in the market architecture. Deeper markets with greater products/instrument innovation is necessary for driving competition. Competition can drive innovation and integration of the operations of the various energy segments, reducing inefficiency and arbitrage. This would help drive down prices on the average.

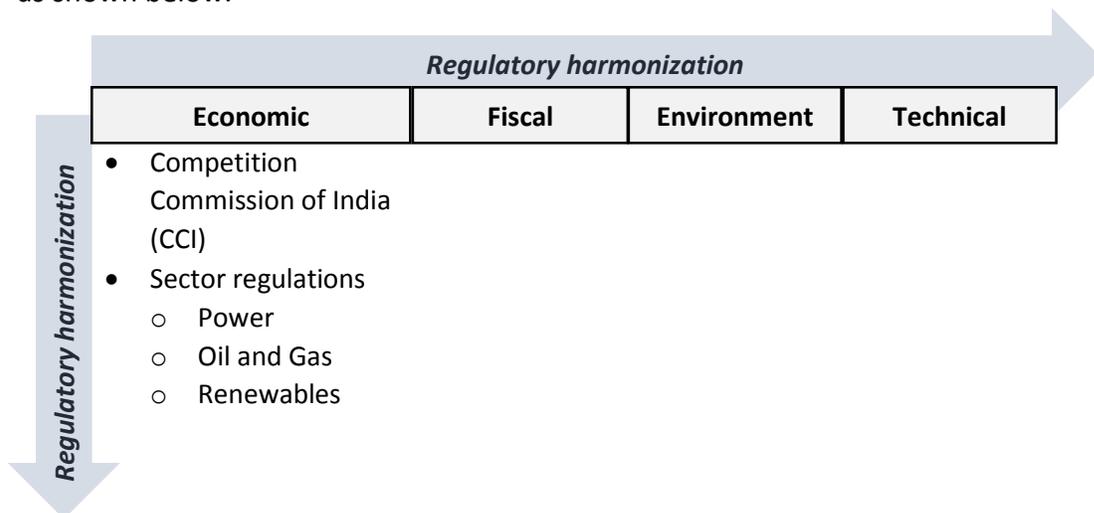
India is also reliant on energy imports, particularly in hydrocarbons, which is likely to continue in the foreseeable future. In order to fulfil the objective of energy security, energy imports – particularly of hydrocarbons – are essential, for which India has to necessarily interface with global markets. The National Energy Policy has to look at a framework to support renewables which in the present scenario is not able to ready for market based competition with other segments. As a principle, new and promising resources (especially those that are consistent with long term policy objectives on aspects like the environment) need to be supported for a period of time till they are ready for market based competition. Such a readiness will be reflected by the price points as well as state of adoption of the technologies by businesses and markets.

### **B. Infrastructure Development**

Infrastructure is a necessary pre-requisite for markets to function in an integrated manner. In the energy sector, market development can get seriously impacted by infrastructure inadequacies. The discussion proposed that a framework where infrastructure development is incubated through Governmental action initially and in later stages let the markets develop infrastructure. Underwriting of strategic investments by the Government, taking into consideration the overall economic benefits can be one means to achieve the same. The neutrality/independence of infrastructure was also felt to be a requisite. It is also necessary that infrastructure players should not be exposed to commodity risks. This happens in the natural gas transmission sector at this time because of extant regulations (but not in the power sector because of the better designed regulations).

### C. Regulatory Harmonization

Multiple forms of regulations like economic, fiscal, environmental, technical etc. exists across central and state level. In future, the size and complexity of the sector will be incompatible with heavily regulated and administratively driven market structure. Hence, it is necessary that regulatory harmonization occurs for different regulations and also with sub-categories as shown below.



The fundamental premise of economic regulation adopted by the various sector regulations should be similar and policy should aim to ensure the same. Regulatory forum shopping should be prevented through clearly articulated principles and jurisdiction definitions. Finally,

all opportunities to reduce or rationalize the number of regulatory institutions should be pursued.

#### **D. Appropriate Risk Allocation**

The policy should consider means to allocate risk through specific mechanisms which could include sharing of risks in a fair and transparent manner. For this purpose, the NEP should articulate which entity or categories of entities should bear the various kinds of risks in the energy sector, duly considering the operations of deep competitive markets in co-existence with long term contracts. In particular, risks around taxation need specific attention since efficient markets depend heavily on a predictable, harmonized and dispute free tax regime.

Before finalizing the principles, it is necessary to revisit the current status around tenets and identify fundamental arrangements for “transition” to occur by setting of long term goals and targets. The process for the transition needs to be supported by a very strong operational framework ensuring that any new laws/legislations adhere to the principles identified along with provisions to amend the same.

#### **Transition Mechanisms – Towards Deeper Markets**

A seven to fifteen year horizon was considered as a transition period towards deeper markets. The key goals for markets were identified (listed below) that would enable shift towards deeper markets.

- Market volumes – Should be substantial in any of the segments. Significant increase from present levels need to be targeted in segments where competitive markets already exist.
- Consumer participation – Need to be actively encouraged by policy.
- Capacity trading/markets – Over time, capacity trading (e.g. in transmission) needs to be encouraged in addition to trading of the commodities.
- Reliability – Markets need to be designed to contribute to enhanced levels of reliability for consumers.
- Greater affordability – Prices from markets should be demonstrably lower as compared to alternatives over a time period.

- Regulation – Harmonization needs to be driven through policy and legislation.

For achieving these goals, there are some clear non-negotiables to be set out. In particular, non-discriminatory access to infrastructure was felt to be the key amongst them. With these key markers identified, review of the broad principles from time to time during the transition period has to be certainly followed.

For effective market operations, financial products and instruments are also essential along with the physical trading instruments. While these carry their own risks, such risks need to be managed appropriately through regulatory oversight. The rapidly changing energy scenario in the country will inevitably pose challenges to the traditional utilities which face the risk of capacity being stranded. Markets can provide some form of safety net against such stranding due to the flexible trading that they enable. However, participation in markets and benefitting from them require specialist skills. Utilities need to be made ready to manage the transition into the competitive markets, and the NEP should incorporate measures for the same.

# Annexure I

## Markets as an Enabler for Energy Sector - Background Note for National Energy Policy (NEP)

### A. Background

NITI Aayog has been undertaking consultations on the framing of the National Energy Policy 2047 (NEP). Shakti Sustainable Energy Foundation (SSEF or Shakti) has been tasked to assist in the consultations on adoption of markets as an enabler for energy sector development. This background note is aimed to assist those consultations, to be held on October 19, 2015. The outcomes of those consultations will be conveyed to NITI Aayog following Chatham House<sup>1</sup> rule.

The discussions will adopt the following broad flow:

1. Validate the hypothesis that deeper markets in energy are indeed required for more comprehensive energy sector development in the country;
2. Identify broad design propositions and principles for market operations;
3. Evolve a high level roadmap around introduction/deepening of the energy markets;
4. Discuss some of the key requisites for effective development.

With the sole aim of enabling the discussions and without attempting to present definitive views, this background note outlines the premises for adoption of markets as an enabler for the energy sector in India.

### B. Why Energy Markets?

The future energy scenario in India is likely to witness massive changes in the ways in which energy is produced, delivered and consumed. These changes will be driven by developments within the energy sector (primarily driven by unprecedented technology development) and also in the manner in which citizens conduct their lives. Globally, the manner in which tomorrow's consumers consume energy will be distinctly different from the present day.

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<sup>1</sup> When a meeting, or part thereof, is held under the Chatham House Rule, participants are free to use the information received, but neither the identity nor the affiliation of the speaker(s), nor that of any other participant, may be revealed. <https://www.chathamhouse.org/about/chatham-house-rule>

Today's consumer is largely a passive user. Increasingly the ordinary consumer will be owning and/ or controlling the energy resources and consumption better due to technological advancements (say solar panels, electric cars, smart-grids etc.). Over time the consumption profiles will also display radical changes with large scale urbanization, telecommuting, move to home office environments being encouraged by large corporations and other such behavioral alterations. This will impact overall consumption (which may even reduce on a like to like comparison) and also the manner in which it is produced and consumed. At the other end, deep seated changes in manufacturing, logistics and e-commerce will alter consumption patterns in the industrial and commercial sectors.

The size, diversity and complexity of the sector will be incompatible with heavily regulated and administratively driven market structure that characterizes the energy value chain across hydrocarbons, coal, electricity and other commercial energy forms. A principal proposition of this note is that these changes in consumer behavior and complexity in energy sector operations will only accelerate in the future. This would seriously impact the present day market structures and regimented utility operations. The follow on proposition is that the selection and operation of these disparate means of production and consumption is best done through competitive markets, with essential safeguards ensured by regulatory/ competition authorities (for efficiency and fairness) and by governments, through limited and focused interventions to ensure affordability and equity. This will necessitate deep changes to the way energy sector governance happens today.

In reality, the energy sector operations are deeply interlinked – with fuel, logistics, energy production, conveyance and utilization – all forming a continuum. However, there is often a trend to treat these sub-sectors as independent areas of operation, having their own operating rules and sector structures. For example in India, fuel/resources are dealt with by three separate ministries at the national level (Coal, Petroleum and Natural Gas, New and Renewable Energy), energy production value chain by others (Power, Heavy Industries), and logistics by separate transport ministries (Railways, Surface Transport). Regulation is also undertaken for all these sectors separately (Central Electricity Regulatory Commission, Petroleum and Natural Gas Regulatory Board, or departmentally by individual ministries).

Competition aspects are addressed by the Competition Commission of India which sometimes has a seemingly overlapping mandate with the sector regulators and ministries. In addition, the states have their own jurisdiction on aspects that are either on the State list or the Concurrent list of the Constitution. The governments have attempted to bring about better coordination among the ministries that are connected (e.g. Coal, Power, and Renewable Energy currently through a common minister), but this is only a very initial measure.

As the operations in each of these sectors grows to be more complex and inter-related, administrative actions and distinct sectoral management will present greater challenges. At the same time integration without a common and effective set of operating principles will create unwieldy structures and seriously impair flexibility and agility. Markets, in this context, are seen as the possible means to let the principles of commerce operate across these sectors following a common broad design and a basic set of principles that can be reflected in policies (implemented by governmental authorities) and regulations (by regulatory authorities) to ensure harmonious operations within the energy sector.

### **C. Current status of markets in the Indian energy sector**

Since the 1990s, the Indian energy sector has witnessed some degree of competition “for the market”, which entailed competitive allocation of rights to production and sale of energy commodities. In the power sector this was manifested to competitively bid out power contracts, in the Oil and Gas sector through concessions under the various rounds of the New Exploration and Licensing Policy (NELP). More recently coal mines have also been auctioned through competitive processes (after the annulment of governmental allocations by the Supreme Court of India). Gas infrastructure development has also been bid out under the pipeline and City Gas authorization mechanisms.

The allocations through competitive processes have unfortunately not resulted in the creation of dynamic and liquid markets, and indeed they were not intended as such. If at all, it was only a refined way of allocation of resources on a long term basis where the exchequer

got a share and/or the costs for consumers was aimed to be kept low. It is believed by some that the allocations through long term and intensely prescriptive contracts have perhaps only increased the rigidity of sector operations that have in effect caused efficiency losses and reduced ability to respond to changing market and consumer behavior.

That said, India has experimented with some amount of free market play on the margins. Within the energy domain, market based operations in India were actively promoted in the electricity sector through the Electricity Act, 2003. However major challenges have been witnessed in the course of implementation:

- a. The fuels sector (coal, gas) was not correspondingly freed up. With fuels being a principal cost in the electricity value chain, this in turn distorted the operations of the power markets;
- b. Simultaneously, the retail end of the power sector was kept in the hands of the (mostly) state owned power distribution monopolies. This resulted in very low accountability levels and on the whole was unfavorable to the causes of innovation, consumer service and efficiency;
- c. Dominant state ownership is believed to have resulted in imperfect regulation, anti-competitive behavior, political influence and protectionism. This in turn subverted markets.
- d. In effect, severe and uneven regulation of the sector (that was purportedly de-licensed and deregulated through the Electricity Act, 2003) has brought matters to a standstill and has put more than INR 500,000 crores of capital to inordinate and unforeseen risk;

Beyond power, the broader energy sector has also seen some tepid measures to introduce an emissions/ clean energy markets. These have also been beset with problems in market design and credibility. In the coal and gas sectors, the quasi-monopoly players have taken up sales through e-auctions. While these have served some useful purposes, broader goals of transparent price discovery, liquidity and flexibility have not been served.

Due to the structure of its energy sector, India still relies on significant governmental intervention in energy planning and delivery. Analysis also indicates that there is an apparent decoupling of the energy demand (especially the large scale centralized variety) and GDP growth. This trend is likely to accelerate in the future as consumers start controlling their own energy production and consumption.

#### **D. Setting Market Development Goals and Transition Plans**

In summary, the energy sector in India is far too large and complex to be governed solely through administrative interventions and regulatory orders. Especially in the context of long range policy formulation that the NEP aims for, there is an apparent need to revisit the present structures, design and operating principles and consider possibility of a more open, flexible and inclusive arrangement of sector development that will allow sector participants as well as users/ consumers to operate and make choices in a free and more transparent manner.

Markets should be effectively introduced across the energy value chain. Apart from power and renewable energy where the country has some experience with markets, India can emerge as an energy trading hubs for energy products including coal and natural gas and greatly benefit from better supplies and lower prices if a strong locational market emerges. Emergence of a strong fuel market is predicated upon significant reforms for freeing up product pricing. It will also require overhaul of the network open access and pricing regime to bring about more flexibility in sourcing, delivery and consumption.

Defining the design of the future markets and the rollout roadmap will inevitably involve a large number of questions and considerations. For example, effective market operations are greatly aided by the availability of financial products to settle trades and manage risks by participants. However these financial product-markets carry their own sets of risks that unless managed well can cause systemic issues. In a critical sector like energy that does become an important consideration. A related issue is of network/ capacity trading (as compared to energy content trading) arrangements, which could enhance market flexibility.

At the other end, India's energy basket has a very significant contribution from non-commercial energy forms. The need and the avenues to integrate these into the broader energy markets will also need investigation.

The transition will be important. Even as India aims to become economically stronger and have a dominant presence in the future global economic scene, it is undeniable that a significant section of the population need some amount of support to ensure that basic access and consumption is not limited. However it can well be argued that the markets can be used to ensure better and more transparent benefits delivery to the segments of the economy and population that need such protection. This has been done globally, and once it sets the market goals, India can investigate and adopt appropriate mechanisms in this regard. Competing alternate marketplaces where energy products/ solutions are traded would foster innovation. Governments need to promote them (with necessary safeguards to promote fair, transparent and competitive operations) instead of restricting them.

Markets also depend significantly on the creation of a strong delivery backbone. The country has to ensure that such infrastructure development is in lockstep with opening up of the markets. The adequacy of infrastructure is a serious issue in the present day energy sector. With markets as the center-piece, it will be necessary to step up infrastructure creation and ensure operation of the infrastructure in an efficient fair and transparent manner without conflict of interest. The degree of accountability called for from the infrastructure providers will be of a different order as compared to today.

There will also be inevitable impact of the entrenched utilities and quasi monopoly operators that control critical infrastructure and processes. However it can well be argued that this will be for their own welfare. The present dynamics of the market in terms of demand volatility, modal shifts in consumption, energy efficiency, etc. will only affect their operations in unforeseen ways. Markets can help them become more agile and graduate their response rather than being at the receiving end of such changes. Governments will also benefit from the limitation of the open ended exposure that they take in today's operating environment,

affecting the foundations of economic stability since any impact in the energy sector is inevitably very large.

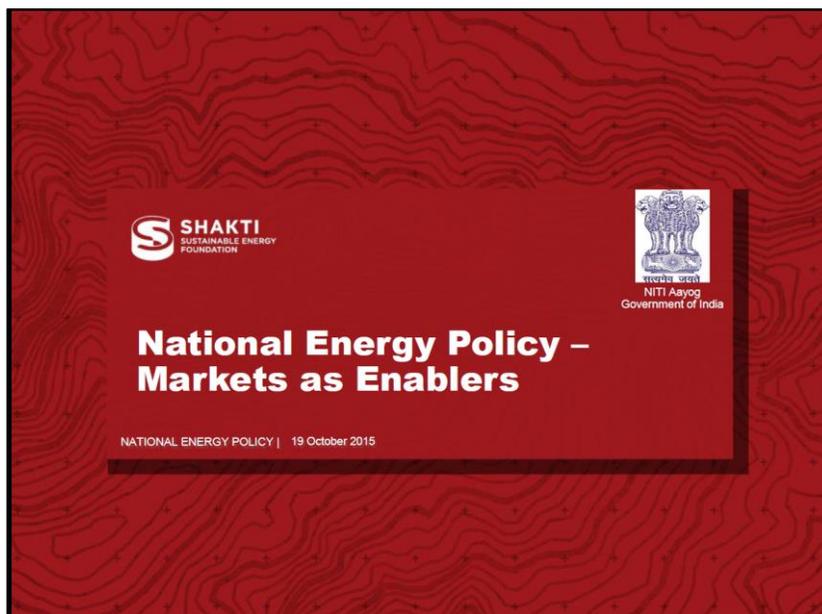
#### **E. Key Questions**

In light of the foregoing, some key questions for discussion are stated below:

1. Can markets truly act as an integrator in the energy sector? What are the key requisites for such markets?
2. What would be the broad market architecture? Which parts of the energy chain are amenable to market operations? Which parts need to be kept outside markets? Over what timeframe?
3. What are the checks and balances required for efficient functioning of the markets?
4. Markets depend on underlying infrastructure – how can infrastructure creation be ensured?
5. How can regulation of markets be harmonized for efficient and effective functioning?
6. What would the contours of a broad roadmap to the end state? How can the transition be effected smoothly?
7. What are the policy actions required to ensure the above?

# Annexure II

## Markets as an Enabler for Energy Sector – Presentation to stakeholders



### Agenda

- *Background*
- *Need for Energy Markets*
- *Challenges in the current context*
- *Important considerations for future preparedness*
- *Key Questions for Discussions*

# Background & Objective

## Background

Shakti Sustainable Energy Foundation (SSEF or Shakti) is assisting Niti Aayog on the theme of “Energy Markets” for framing of the National Energy Policy 2047

## Objectives of discussion

|  |   |
|--|---|
| Validation of hypothesis                 | Deeper markets in energy are necessary for more comprehensive energy sector development |
| Identification of key propositions       | Identify broad design propositions and principles for market operations                 |
| Development of roadmap for energy market | Evolve a high level roadmap around introduction/deepening of energy markets             |
| Discuss key requisites                   | Discuss some of the key requisites for effective development                            |

Enable discussions around adoption of markets as enabler for energy sector development under the National Energy Policy 2047



# Need for Energy Markets

Where are we now ?

- Energy sector has witnessed some degree of completion “for the market”
  - Competitive bidding of power contracts
  - Concessions under NELP
  - Pipelines & City Gas Authorization Regimes
  - Coal mine auctions
  - Few measures undertaken for introduction of clean energy markets
- Market based operations actively promoted through Electricity Act (2003) but challenges exists



Why is there a need for energy markets ?

- Future changes in energy production, delivery and consumption profiles
- Increase in complexity of operations if distinct sectoral management continues



How do we get there ?

- Setting market development goals and transition plans
- Effectively introducing markets across the energy value chain

In the context of long range policy formulation that the NEP aims for, there is an apparent need to revisit the present structures, design and operating principles of energy sector



## Challenges in the Current Context

### *The major challenges faced by the sector in the current framework:*

- **Lack of creation of dynamic market under current mechanisms**  
**Allocations through competitive processes** not resulted in creation of dynamic/liquid market
- **Uneven regulations**  
**Implementation** of market based mechanisms under the Electricity Act (2003) faced **challenges** due to **uneven regulations**
- **Dominant state-ownership in power distribution**  
**Low accountability levels** of state owned power distribution monopolies at the retail end of the power sector
- **Governmental interventions**  
 India still **relies** on significant governmental **intervention in energy planning and delivery**
- **Infrastructure challenges**  
**Adequacy of infrastructure** is a serious issue in the present day energy sector
- **Overlap of responsibilities amongst ministries/government bodies**  
 Energy sub-sectors function as **independent areas of operation**, having their own operating rules and sector structures resulting in overlapping of responsibilities



## Important considerations for future

### *Setting market development goals that will cater to:*

- **Flexible mechanisms**  
 Bringing about more flexibility in sourcing, delivery and consumption under the current network open access and pricing regime
- **Integration of Non-commercial energy forms**  
 Integration of non-commercial energy forms into the broader energy markets as they constitute a very significant contribution in India's energy basket
- **Infrastructure linkages**  
 Adequate infrastructure development is in lockstep with opening up of the markets with higher degree of accountability from developers
- **Appropriate mechanisms** to facilitate the transition is very important



## Key Questions for Discussions

- **Market Architecture** - What would be the broad market architecture? Which parts of the energy chain are amenable to market operations? Which parts need to be kept outside markets? Over what timeframes?
- **Requisites for energy markets** - Can markets truly act as an integrator in the energy sector? What are the key requisites for such markets?
- **Effective functioning of markets** - What are the checks and balances required for efficient functioning of the markets?
- **Infrastructure creation** - Markets depend on underlying infrastructure – how can infrastructure creation be ensured?
- **Regulatory harmonization** - How can regulation of markets be harmonized for efficient and effective functioning?
- **Road map** - What would the contours of a broad roadmap to the end state? How can the transition be effected smoothly?
- **Policy actions** - What are the policy actions required to ensure the above?



**Thank you**

