



Forum of Regulators

Roll out Plan for Introduction of Competition in Retail Sale of Electricity

Final Report

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Assisted by:



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List of abbreviations

Abbreviation	Full Form
APTEL	Appellate Tribunal for Electricity
AT&C	Aggregate Technical and Commercial
AVVNL	Ajmer Vidyut Vitran Nigam Ltd.
BESCOM	Bangalore Electricity Supply Company
BPL	Below Poverty Line
BRPL	BSES Rajdhani Power Ltd.
BSEB	Bihar State Electricity Board
BYPL	BSES Yamuna Power Ltd.
CESU	Central Electricity Supply Utility of Odisha
CGRF	Consumer Grievance Redressal Forum
CHESCOM	Chamundeshwari Electricity Supply Company
DHBVN	Dakshin Haryana Bijli Vitran Nigam Ltd.
Discom	Distribution Company
DMO	Distribution Market Operations
DNO	Distribution Network Operations
DPO	Distribution Planning Operations
DSO	Distribution System Operations
DT	Distribution Transformer
DVVN	Dakshinanchal Vidyut Vitran Nigam Ltd.
EA 2003	Electricity Act 2003
FOR	Forum of Regulators
GESCOM	Gulbarga Electricity Supply Company
HESCOM	Hubli Electricity Supply Company
IC	Intermediary Company
ISL	Incumbent Supply Licensee
JdVVNL	Jodhpur Vidyut Vitran Nigam Ltd.
JVVNL	Jaipur Vidyut Vitran Nigam Ltd.
KESCO	Kanpur Electricity Supply Company Ltd.
KYC	Know your customer
MSEDCL	Maharashtra State Electricity Distribution Company Ltd.

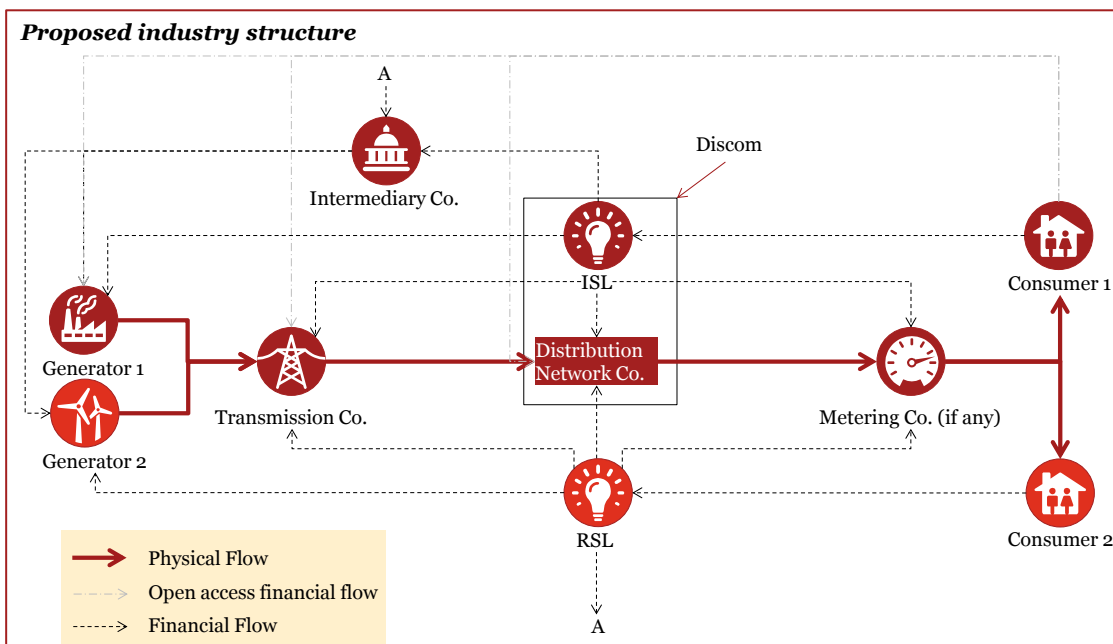
Abbreviation	Full Form
MVVN	Madhyanchal Vidyut Vitran Nigam Ltd.
MW	Mega Watt
NBPDCL	North Bihar Power Districution Company Ltd.
NESCO	North Eastern Electricity Supply Utility of Odisha
Pasch VVN	Paschimanchal Vidyut Vitran Nigam Ltd.
PGVCL	Paschim Gujrat Vij Company Ltd.
POLR	Provider of Last Resort
Poorv VVN	Poorvanchal Vidyut Vitran Nigam Ltd.
PPA	Power Purchase Aggrement
PwC	Pricewaterhouse Coopers
RA	Regulatory Assests
RInfra-D	Reliance Infrastructure Distribution
RSL	Retail Supply Licensee
SBPDCL	South Bihar Power Districution Company Ltd.
SCADA	Supervisory Control and Data Acquisition
SERC	State Electricity Regulatory Commission
SESCO	Southern Electricity Supply Utility of Odisha
SLDC	State Load Despatch Centre
SOP	Standard of Performance
T&D	Transmission and Distribution
TPC-D	TATA Power Company Distribution
TPDDL	TATA Power Delhi Distribution Ltd.
UC	Universal Charge
UHBVN	Uttar Haryana Bijli Vitran Nigam Ltd.
UK	United Kingdom
USO	Universal Service Obligation
WESCO	Western Electricity Supply Utility of Odisha

Executive Summary

The Electricity Act, 2003 laid down the foundation for introducing competition at the consumer end of electricity supply through open access and provision for parallel Distribution licensees. However both these concepts have seen limited success in the Indian electricity sector. The parallel distribution licensee regime requires distribution licensees in an area to distribute power “through their own distribution system within the same area”. Each distribution licensee investing in its own network not only leads to replication of network but, in the event of capital investment being a pass-through expense, also pushes up costs/tariffs for the end consumers. On the other hand open access too has seen lacklustre operationalisation due to factors like power deficit scenario in many states, inadequate transmission/distribution facilities, high level of cross subsidy etc.

The distribution companies in India manage businesses of two different natures – carriage (distribution) business and content (retail supply) business. Retail supply business would involve the service side of the business like purchase of electricity from generators, selling electricity to consumers, customer services, billing, and collection of charges from consumers. On the other hand the Distribution business would involve the technical side of the business like setting up of physical network in order to wheel electricity to consumer premises. In a market structure wherein the carriage business as well as content business is handled by a single distribution company, the scope for introducing “open access” and retail competition is vague. The carriage business side of the distribution company by nature is monopolistic and would deter unless made neutral, open competition in content side of the business.

To overcome this issue and provide end consumer “choice”, amendment to the Electricity Act, 2003 have been introduced in the parliament. One of the major amendments proposed in the Act is introduction of competition in retail supply side of the electricity distribution sector through segregation of Distribution companies (Discoms) into two parts – carriage (distribution) business and content (retail supply) business. While the Distribution business would be monopolistic in nature, the Electricity (Amendment) Bill 2014 envisages introducing competition in retail supply side of the Discom’s business. Section 14 of The Electricity (Amendment) Bill 2014 provides for multiple retail supply companies in an area of supply. These multiple retail supply companies would then compete with each other for supplying electricity to consumers. In such a market all carriage (Distribution) businesses will serve as common carriers and will be paid a reasonable regulated rate of return on their investments.



Industry structure under retail supply competition

- **Single Distribution Company in a supply area:** The Electricity (Amendment) Bill 2014 says that The Appropriate Commission shall not grant license to more than one distribution licensee in any area of distribution. Section 12 of the Electricity (Amendment) Bill 2014 states the following:

“The Appropriate Commission shall not grant licence to more than one distribution licensee in any area of distribution:

Provided that where two or more distribution licensees within the same area of distribution are existing on the date of the commencement of the Electricity (Amendment) Act, 2014, they shall continue their operation till such period as specified in their licence.”

- **Multiple Supply Licensees in a supply area:** The Electricity (Amendment) Bill 2014 allows for multiple retail supply licensees in a supply area. Section 14 of the Electricity (Amendment) Bill 2014 states the following:

“...Provided also that the Appropriate Commission may grant a licensee to two or more persons for supply of electricity within the same area of supply, progressively as may , subject to the conditions....”

- **Intermediary Company to be formed for allocation of existing PPAs:** the Electricity (Amendment) Bill, 2014 brings in the concept of ‘Intermediary Company’. While the main purpose of this entity is to succeed the existing PPAs and power procurement arrangements of the current Discoms and allocate them between various retail supply companies accordingly, the Electricity (Amendment) Bill, 2014 gives Central Government flexibility to define the roles and responsibilities of the Intermediary Companies. As discussed later in this report, based on the roll out plan finalised by state and central governments, the Intermediary Company could be given additional responsibilities like handling of Cross Subsidies, handling of Distribution Marketing Operations (DMO)/Distribution System Operations (DSO), collection of Universal Charge Fund or amortisation of regulatory assets. Section 2(35B) and Section 131 (4C) of the Electricity (Amendment) Bill 2014 states the following:

‘Section 2 35B) "intermediary company" means the entity succeeding to the existing power purchase agreements and procurement arrangements of the relevant distribution licensees on re-organization as per subsection (4A) of section 131 and discharging such other functions as may be assigned to it in terms of the provisions of the Act.’

‘Section 131 4C) The functions of the intermediary company shall be as prescribed by the Central government.’

- **Transfer scheme to be made by state governments for segregation of content and carriage businesses:** In Section 131 of The Electricity (Amendment) Bill 2014, sub-sections 4A) and 4B) are added which provide for transfer scheme:

‘Section 131, 4A) The State Government shall within the period specified under section 51A draw up a transfer scheme for transfer of such of the functions, the property, interest in property, rights and liabilities of the distribution licensees relating to supply of electricity to a company who shall be the incumbent supply licensee for the concerned area of supply and so far as the existing Power Purchase Agreements and procurement arrangements, to which the distribution licensee is the beneficiary in the intermediary company and publish such scheme as statutory transfer scheme under the Act.’

‘Section 131 4B) The distribution licensee shall cease to be charged with and shall not perform the functions and duties under this Act to the extent of the transfers made under sub clause (a) on and after the effective date of such transfer.’

Stages for introduction of retail supply competition

In order to ensure smooth transition of electricity market into retail supply competition, a three stage implementation process of the roll out plan is suggested as follows,

Stage	Time period to complete
1 Functional Segregation of Discoms: In this stage, the current Discoms would be segregated into Distribution and Retail Supply functions. Their individual roles and responsibilities will be defined and they would be equipped with enough financial and manpower resources to take on those roles.	1 - 2 year(s)
2 Preparation for Competition: In this stage the, steps would be taken to make the market conducive for retail supply competition like ownership segregation, cross subsidy reduction, upgradation of metering, loss allocation etc. Entry barriers would be removed in order to create a level playing field for all and encourage competition.	Start: after stage 1 objectives are achieved Completion time: 2-3 years after completion of Stage 1
3 Onset of Competition: New Retail Supply Licenses would be given in this stage in order to give retail consumer choice. The market would be opened up for competition in phases i.e. initially certain set of consumers would be open to competition and then gradually other consumers will be brought under the purview of competition.	Start: after stage 2 objectives are achieved This stage will be an ongoing activity till the time all consumers are open for competition

In each of these stages, certain key tasks would have to be performed in order to prepare the groundwork for content and carriage separation and to provide a level playing field for new retail supply companies.

Stage 1 | Functional Segregation of Discoms | Key tasks required to be carried out

1. Defining new functional entities: the functions of current Discoms would be split as follows –

- Distribution business
- Retail Supply business
- Intermediary Company

The distribution business itself could be segregated into 4 separate functions:

- a. Distribution Network Operations (DNO):** this function covers operation of the network. Also in case the responsibility of other metering related activities¹ is given to the distribution business, the DNO would be the entity in charge of Meter installation/replacement, ownership of metering assets, meter operations and testing.
- b. Distribution Planning Operations (DPO):** this function covers the planning of distribution network expansion, operating code and technical design of the network.

¹ Detailed discussed in section ‘Issues in implementation of retail supply competition’ under heading ‘Issue 3 – Metering Services’

- c. **Distribution System Operations (DSO):** this function covers supervision of the network to ensure integrated operation for achieving maximum economy and efficiency in the distribution network.
- d. **Distribution Market Operations (DMO):** this function involves accounting for the energy handled by the distribution network.

Since each of these 4 functions regarding the Distribution would require completely different skill sets and technology, in the long run each of them should be a separate function operating independent of each other. As a transitional approach till the time separate entities cannot be formed, all of the four functions of DNO, DPO, DSO and DMO are kept with a single entity the Distribution business.

After segregation of current Discom into Distribution and Retail Supply functions, metering services can be responsibility of Distribution or Retail Supply company or it could also be given to a 3rd Party Company². The metering service can be broken down into following activities -

- **Meter reading:** going to consumer premises to record the meter reading or using data communication services (in case of meters supporting this feature) for collecting meter reading data.
- **Other Meter related activities:** Meter installation/replacement, ownership of metering assets, meter operations and testing.

Each of these activities could either be done separately by Retail Supply Company, Distribution Company or a 3rd Party or both of these activities can be taken care by either a single entity. Based on the logical permutations and combinations, several possible approaches for metering are as follows –

Approach/Activity	Meter Reading	Other Meter related
Approach 1	Retail Supply Company	3 rd Party
Approach 2	Retail Supply Company	Retail Supply Company
Approach 3	Distribution Company	Distribution Company
Approach 4	3 rd Party	3 rd Party
Approach 5	Retail Supply Company	Distribution Company

Based on the discussions with FOR and analysis of various pros and cons it is suggested that in all cases the meter reading responsibility be given to retail supply company as the responsibility to reduce collection inefficiency losses would lie with retail suppliers. However the approach to be adopted towards other meter related activities would depend on the *approach adopted towards loss allocation (discussed in task 2 of stage 2 of the roll out plan)*. In case the current level of losses in the state is high, all commercial losses are allocated to retail supply company. As the retail supply company is responsible for majority of losses, the responsibility of other meter related activities is also given to them so that they can better manage their loss reduction strategies. On the other hand if the current level of loss in the state is low, the distribution company would be allocated major losses along with the responsibility of other meter related activities.

2. **Defining Roles and Responsibilities of new entities:** Metering at consumer premises would be the boundary of separation between the Distribution and Supply businesses. While some of the roles and responsibilities of the distribution and supply businesses can be clearly defined, others fall in grey area as

² Although The Electricity (Amendment) Bill 2014 does not mention Metering as a licensed activity, for the purpose of illustrating various possibilities, this report assumes that in case a 3rd party company is brought in the sector for the metering activities, it would be a licensed activity and regulated by appropriate electricity regulatory commission.

these roles and responsibilities would have to be defined based on the approach adopted by individual states towards various issues, while forming their respective roll out plans for retail supply competition.

Business	Segregated Roles and Responsibilities	Ambiguous roles (may vary based on roll out plans of individual states)
Distribution business (Network Operations)	<ul style="list-style-type: none"> • Providing neutral access to its network • Expansion and strengthening of network • Operation and maintenance of the network such as network reinforcement and replacement, improved overhead line repair, etc. • Maintaining 24x7 network availability • Reduction in Technical losses (since the network is owned by distribution business, irrespective of other issues, the responsibility of technical losses would lie with distribution business) • Co-ordination with retail supply companies for new connection release, change in consumer load and disconnection • Fault restoration • Fulfilling regulatory obligations for distribution in tariff determination and efficiency targets 	<ul style="list-style-type: none"> • Consumer Interface • Commercial loss reduction
Distribution Planning Operations	<ul style="list-style-type: none"> • Co-ordination with transmission utility for network planning 	
Distribution Market Operations	<ul style="list-style-type: none"> • Accounting for the energy scheduled, despatched to retail supply companies • Balancing and Settlement • Distribution loss calculation 	
Distribution System Operations	<ul style="list-style-type: none"> • Monitoring of the distribution network operations, supervision and control • Real time operation for distribution network control and despatch • Ensure integrated operation with other entities for maximum operational efficiency 	
Retail Supply business	<ul style="list-style-type: none"> • Demand Forecasting and business planning • Efficient power procurement • Trade power with other suppliers (to account for any power shortfalls or access power than requirement) • Bill generation and distribution • Revenue collection from consumers • Customer Care • Credit contracts • Fulfilling regulatory obligations 	<ul style="list-style-type: none"> • Consumer interface • To ensure contractual availability of power to its consumers • Commercial loss reduction
Intermediary	<ul style="list-style-type: none"> • Procurement of power as per existing PPAs 	<ul style="list-style-type: none"> • Demand aggregation of

Business	Segregated Roles and Responsibilities	Ambiguous roles (may vary based on roll out plans of individual states)
Company	<ul style="list-style-type: none"> Allocation of existing PPAs Managing of existing cross subsidiaries Handling regulatory assets (recognised accumulated financial losses) 	<ul style="list-style-type: none"> multiple Retail Supply companies to enable efficient power procurement Handling of unrecognised financial losses
Metering Company (by Distribution, Retail Supply or 3 rd party)	<ul style="list-style-type: none"> Installation and maintenance of meters Testing of meters Replacement of meters 	<ul style="list-style-type: none"> Meter reading

- 3. Treatment of existing financial losses:** the existing recognised regulatory assets of current Discoms would be transferred to Intermediary Company. The Intermediary Company would then amortize these assets by either collecting a Universal Charge or through financial support from State Government. Unrecognised financial losses on the balance sheets of the discoms, formed due to either dis-allowance of certain costs by the appropriate commission or due to imprudent costs, would either be allocated to existing companies or support may be sought from State Government for cleaning up the balance sheets.
- 4. Treatment of existing PPAs:** the existing PPAs of the incumbent Discoms would be transferred to the Intermediary Company. The state governments in their respective transfer schemes could explore the possibility if some PPAs or a certain part of all PPAs could be shifted to wholesale market i.e. power from such PPAs could then be sold in wholesale market. This may help increase competition in the power purchase side of the sector and also assist in development of wholesale market. Based on the availability of power in the state, in the alternative roll out plans discussed later, either all PPAs or some/certain PPAs are transferred to the Intermediary Company.

In Stage 3 when new retail supply companies would enter the market, the Intermediary Company would allocate PPAs among retail suppliers in order to help them meet their power requirements as well as protect the rights of generators who have signed long term PPAs.

- 5. Defining framework for Consumer Interface:** due to the introduction of multiple new players in the market, a framework for Consumer Interface would have to be designed for speedy redressal of various types of complaint/queries or requests and for various types of consumers i.e. open access consumers, regulated consumers and contestable consumers. A single window interface could be offered by the retail supply company or the distribution company, for all kinds of complaints/queries/requests or a separate interface could be offered by both distribution and supply businesses for matters related to their respective businesses. As per the discussions in FOR meeting and based on the analysis of various pros and cons of each approach, it is recommended that the retail supply companies offer a single window interface for all types of consumer complaints/queris/requests.
- 6. Defining framework for Consumer Grievance Redressal Mechanism:** Currently the utilities are mandated to form a CGRF for redressal of consumer complaints. After the introduction of retail supply competition a two layered Consumer Grievance Redressal Mechanism could exist, as follows –
 - A single CGRF for Distribution, Retail Supply and Metering (if any)

-
- Independent ombudsman
- 7. Segregation of Standards of Performance between entities:** before the segregation of current discoms into distribution and supply companies, the regulatory commissions would have to formulate separate SOPs for each of the business to be formed. The current set of Standards of Performance (SOP) may be allocated between the separate businesses of Distribution, Retail Supply, Intermediary Company and Metering Company (if any).
 - 8. Universal Service Obligation on supply/network licenses:** Electricity being an essential product, the Universal Service Obligation (USO) refers to the practice of providing a baseline level of services to every consumer. Once separation of distribution business and retail supply is achieved, the Universal Service Obligation can be split into two -
 - ‘The ‘Duty to Connect’ – the responsibility to connect a consumer to the network. This would be given to Distribution Company, it being the owner of network.
 - ‘The ‘Duty to Supply’ – the responsibility to supply electricity to a consumer. Initially this would be given to the incumbent Retail Supply Company. After the new retail supply companies come into the market in stage 3 or the roll out plan, the Duty to Supply may extend to them to as well.
 - 9. Tariff Determination Mechanism for new entities:** the SERCs will have to determine unbundled tariffs individually for Distribution Business and Retail Supply Business. For the distribution business, the SERC would determine a regulated tariff. In this stage till the time consumers are not open up for competition, the SERCs would determine a regulated tariff for all the consumers of incumbent retail supply company. However after the introduction of new retail supply companies in stage 3 of the roll out plan, the SERCs would have to determine two separate tariffs for the retail supply companies – a regulated tariff for the non-contestable consumers and a ceiling tariff for the contestable consumers. In order to facilitate this, incumbent retail supply company would have to maintain separate financial accounts for the non-contestable and the contestable consumers.
 - 10. Balance sheet segregation of current Distribution business among new entities.** Assuming meter at consumer premises as the boundary of separation between the distribution and supply businesses, the balance sheet segregation would be based on:
 - **Allocation of assets:** the fixed assets before the meter would be allocated to the distribution business, while the fixed assets beyond meter would be given to the retail supply company. The metering assets would be given to either distribution business or retail supply business depending upon who gets the responsibility of other metering related activities (meter installation/replacement, ownership of metering assets, meter operations and testing). Receivables due from the retail consumers could be allocated to the Intermediary Company. These assets can be used by the Intermediary Company to service its liabilities. The consumer security deposits would be given to the Retail Supply Company based on the number and type of consumer under each of the companies. The guarantee amounts submitted by various contractors of current distribution company will be allocated between Distribution and Supply businesses based on the Fixed Assets allocated between them.
 - **Allocation of liabilities:** Based on the fixed assets allocation between individual businesses, the liabilities attached to them will also have to be allocated to the Distribution and Supply companies respectively. The current liabilities related to power purchase will be transferred to Intermediary Company. The intermediary company would then further collect these from the incumbent Retail Supply Company. Liabilities related to contractor’s payments will be allocated

between the Distribution and Retail Supply companies based on the activities and asset allocation between the two.

The valuation of assets can be either based on historical book value or the market value of assets. The valuation of assets should be an interactive process wherein the views of the investors from discussions should be considered during valuation process. The alternative methodologies would have to be assessed to arrive at a fair valuation of business/ assets. It is pertinent to mention that the valuation of the assets and business shall be in accordance with the revenue potential of the newly formed Distribution and Supply businesses.

- 11. Human resource planning:** the employees of incumbent distribution company will need to be allocated between the two businesses. This would require transferring staff with adequate skill sets to the successor entities for carrying out critical activities independently. The approach for developing this transfer scheme would include understanding the key staff requirements in restructured entities and identifying the services to be split between the entities. If any particular service cannot be split among the entities, then the strategy to retain employees in one unit and providing services to other will have to be formed. Further going forward, the organizational & human resource policies of the separate companies would have to be formed.
- 12. Technical studies of as-is condition:** In order to prepare the groundwork for next stage, baseline studies related to technical and commercial losses and cost of supply determination will need to be carried out. These studies form an important pre-requisite for the introduction of retail supply competition as the allocation of losses, tariff determination and cross subsidy reduction would be done by commissions based on these findings of these studies.

Stage 2 | Preparation for competition | Key tasks required to be carried out

- 1. Ownership of network and retail supply company:** while in the previous stage of this roll out plan, the erstwhile discoms would have been separated into two functions – the distribution and retail supply functions, in this stage, in order to ensure that all retail supply companies get neutral access to the distribution network and there is no complicity between the distribution company and the incumbent retail supply company, the state government may either disinvest their retail supply business or continue it as a state entity but with a separate ownership. It needs to be ensured that while deciding on whether or not to divest the incumbent retail supply company, the provisions of section 14 of Electricity (Amendment) Bill 2014 (as and when passed by the parliament) is not violated which states that while multiple supply licensees could be allowed in a license area, at least one of them should be a government controlled.
- 2. Technical and commercial loss allocation across network and supply company:** there are three approaches that can be adopted for allocation of AT&C losses between distribution and retail supply businesses as follows -

Type of Loss	Allocation to -		
	Approach 1	Approach 2	Approach 3
Technical	Distribution	Distribution	Distribution
Commercial			
Theft by Hooking	Distribution	Distribution	Retail Supply
Inaccurate metering	Distribution	Retail Supply	Retail Supply
Theft by Meter tampering/bypassing	Distribution	Retail Supply	Retail Supply
Collection inefficiency loss	Retail Supply	Retail Supply	Retail Supply

While the Technical and Hooking losses should be allocated to Distribution business, as these losses are related to physical network, it is difficult to measure and differentiate between these losses. Therefore, except collection inefficiency and technical losses (which can be measured), all the other losses would be allocated to a single entity. This translates to adopting either approach 1 or 3 of loss allocation.

In license areas where the current level of losses is high, entire commercial losses could be allocated to the retail supply business to attract investment, improve metering and faster reduction of losses. This translates to approach 3 of loss allocation.

In license areas where the current level of losses is on the lower side, the commercial losses other than collection inefficiency could be allocated to the distribution business. This translates to approach 1 of loss allocation.

Therefore, based on the current level of transmission and distribution losses (AT&C loss less collection efficiency) in the state, in the alternative roll out plans discussed later, either approach 1 or approach 2 of loss allocation could be adopted.

- 3. Reduction of cross subsidies:** Identification of actual cost incurred for supply of electricity and tariff reflecting the cost of supply for various consumer categories is important for retail supply market to work efficiently. In the existing tariff regime large consumers like industrial and commercial are paying tariff higher than actual cost of supply and thus cross subsidising domestic and agriculture consumers. There are four possible approaches for reduction of cross subsidies:

S. No.	Approaches for cross subsidy reduction
1	Year on Year tariff hikes
2	Universal Charge (UC) fund ³
3	Limiting subsidies to wheeling charges ⁴
4	Direct Subsidy from State Government

Considering high level of cross subsidies for some categories in certain states, the approach of ‘Year on Year tariff hikes’ could lead to tariff shocks. Also the wheeling charges may not be sufficient to subsume the high level of cross subsidies. Therefore either approach 2 of UC fund or approach 4 of Direct Subsidy could be adopted to reduce cross subsidies.

- 4. Upgradation of existing metering:** The existing meters would need to be gradually replaced by advanced meters, which are capable of recording consumption for every 15 min time slots to allow for accurate measurement of loss levels in each area of supply and voltage levels, calculation of actual power purchased and sold by each retail supply company and to allow switching power off at consumer end, rather than at feeder level. the metering infrastructure till the distribution transformer will have to be upgraded by the distribution business. The incumbent supply company would have to convert un-metered consumers to metered consumers.
- 5. Creation and ownership of Consumer Database:** Going forward, a central database would need to be created with information regarding the consumer such as their billing address, meter number, usage pattern, bank account details etc. The distribution company (wire business) can be made responsible for creating and updation of this database. The distribution company would share this database with commissions, intermediary company, retail supply companies and any other player as required. The retail suppliers would collect and share data with distribution business regarding the consumers under their respective jurisdiction. In order to develop this database, an activity similar to Know Your Customer (KYC) can be carried out for electricity consumers. Such a database would be useful to companies applying for Retail Supply license as they would need information about the consumer mix in the license

³ Detailed working explained in appendix 1

⁴ Detailed working explained in appendix 2

area where they want to operate so as to make an informed decision. Also, the subsidies from Government could be transferred to consumer's bank account directly in future using the information from consumer database.

Stage 3 | Onset of competition | Key tasks required to be carried out

- 1. Defining license area and issuance of new supply license:** After the entry barriers are removed for the entry of new retail supply companies, second (and further on) retail supply company would be allowed to enter market in order to compete with incumbent retail supply company. The area of supply for the new Retail Supply Company would be coterminous with the license area of the incumbent supply license of the area. States with the large area coming under one distribution license may break the license area in smaller areas keeping in mind the consumer and sales mix. A package of cities or areas could also be offered to the new retail supply companies. These packages may consist of areas like an urban area combined with a rural area. While the urban area would be an attractive proposition for the new retail supply company due to higher consumer density and therefore greater revenues, the supplier could be given a rural area along with it so as to promote level playing field to all players and also promote rural electrification. The various packages formed should be comparable with each other in terms of parameters like consumer mix, loss levels, connected load patterns etc. This would ensure that new retail supply companies do not cherry pick within the packages.

- 2. Phasing of competition – identifying contestable consumer categories or connected load:** In a particular supply license area, the retail competition can be introduced in phases, where in each phase, the new retail supply companies would be allowed to supply electricity to a certain section of consumers. Phasing is important because it allows a pilot study by introducing competition in a smaller section of consumers first. Further phasing allows new players time to ramp up their resources gradually and acclimatise down to new regulations and industry structure. Phasing can be done based on connected load of consumer, energy consumption of consumer, area of supply or consumer category. Further the phasing can be done in an increasing or decreasing fashion based on these factors.

Since it is difficult to determine area wise/circle wise losses and costs, phasing based on area of supply would be difficult to implement. Using consumer category as a factor would require determining consumer category wise losses which would also be difficult to implement. Phasing based on energy consumption as a factor would pose operational difficulties in identifying consumers open for competition as the energy consumption of a consumer could change frequently. As per the discussion with FOR and pros and cons of various approaches, it is suggested that phasing could be either decreasing connected load or increasing connected load of consumers. In the decreasing connected load approach, the consumers with higher connected load, say 100 kW and above, would be open for competition first and in later phase, threshold limit can be reduced further. In this approach, the number of consumers open for competition, will be smaller, which will help new retail supply companies in gradually scaling up their operation, however, bulk of the consumers will not get the option of selecting their retail supplier in the initial phase in this approach. In the increasing consumer load approach, the consumers with lower connected load, say up to 20 kW, will be allowed to select their retail supply company. As majority of these consumers are connected at lower voltage, where majority of distribution losses incur, the loss reduction opportunity will be higher for the new retail supply company, however, the scale of operation required, will be a big challenge and may act as an entry barrier for new players and result in non- starter of the entire reform process.

- 3. Power procurement model – allocation by intermediary company:** PPAs remain one of the most important sources of power procurement for discoms as the wholesale markets are still in nascent stages of development. Majority of the generation capacity is tied up in long term PPAs with the current discoms. Therefore when new retail supply companies enter into the market they may find it difficult to procure power. As discussed in stage 1 of the roll out plan, the existing PPAs of the current Discoms are to be transferred to the Intermediary Company. The Intermediary Company would allocate these PPAs between various retail supply companies based on their power requirements.

In case where the quantum of PPAs with the current discoms is less than the power requirement in the area of supply, it is possible that the Intermediary Company is unable to meet the entire power demand of all the retail supply companies. In such case the Intermediary Company could either meet the entire demand of incumbent retail supply companies and then provide remaining power to the new retail supply companies or allocate PPAs proportionately between all retail supply companies. Based on the discussions with the FOR and analysis of various pros and cons, it is suggested that the Intermediary Company allocate PPAs proportionately between all retail supply companies. A formula will need to be derived for allocation taking into consideration factors like Duration of PPAs, average/peak demand of consumers with each Supply company, consumer mix of Supply companies, size of PPAs, etc. Also in such a case where the quantum of PPAs with the current discoms is less than the power requirement in the area of supply, the new retail supply companies may be given flexibility to procure power from the market first and then accept power from the Intermediary Company if required.

Further in case where the quantum of PPAs with the current discoms is more than the power requirement of the area of supply, the Intermediary Company could be left with excess PPAs after meeting the requirements of the retail suppliers. Also it is possible that power is available in the market at rates cheaper than the PPAs. In such cases the retail supply companies would want to not accept power from the Intermediary Company and purchase power from the market instead. However since the Intermediary Company does not have assets or sufficient revenue sources to take on financial losses due to un-allocated PPAs, it is suggested that the retail supply companies mandatorily accept all the power allocated by the Intermediary Company and then approach the market for any additional requirement that they may have.

The Intermediary Company could either allocate the PPAs as a whole to retail supply companies or allocate power from these PPAs to the retail suppliers. Also in case the Intermediary Company allocated power to retail supply companies instead of PPAs, it may charge a uniform average cost of power purchase from suppliers or calculate a differential bulk supply tariff. Further the allocation of PPAs between retail supply companies could either be fixed or dynamic. In a fixed allocation, the PPAs/power once allocated would not be changed even if the consumer base of retail suppliers change, while under dynamic allocation the allocation of PPAs/power would be revised at fixed intervals to account for changing consumer base of retail suppliers. These issues would have to be detailed in the transfer scheme and roll out plans to be developed by individual states.

- 4. Consumer switching mechanism:** Shifting of consumers from one retail supplier to another would need deliberation on following changeover activities –
- **Recovery of stranded costs like past revenue gaps or regulatory assets from consumers:** In case SERCs allow creation of new regulatory assets to cover stranded costs of retail supply companies in future, and if consumers of such retail supply companies switch to another retail supplier, this would leave with the retail supplier a smaller consumer base to recover regulatory assets. To prevent this, the Intermediary Company may have to create a mechanism to ensure collection of these costs from concerned consumers irrespective of the retail supplier they are taking electricity from.
 - **Recovery of dues from consumer:** a consumer may have dues to be paid to its current retail supply company. The retail supplier would in turn have to make payment to distribution business for the wheeling charge and generators for the power purchase cost on account of such consumers. If such consumers who have outstanding dues, switch to another supplier, the recovery of dues for wheeling and other charges becomes an issue. Also it is possible that current Retail Supply Company would have disconnected certain consumers due to non-payment of dues. It needs to be deliberated whether such consumers would be allowed to take a new connection from another retail supply company or not, before the resolution of its disputes with current retail supply company. To resolve these issues, a robust communication mechanism will have to be developed

by the retail supply companies among themselves to ensure such consumers are not allowed to switch retail suppliers without clearing their past dues.

- **Defining consumer category at the time of switching:** it needs to be deliberated whether a consumer would be allowed to change consumer category while switching its retail supplier.
- **Security Deposits:** It needs to be deliberated whether the existing security deposit of consumer with the current retail supply company would be refunded to the consumer or settled with the new retail supply company.
- **Frequency of consumer switching:** it needs to be deliberated that will the consumers be allowed to switch from one retail supplier to another on certain dates or anytime during the year. Based on the discussion with FOR and analysis of various pros and cons, it is suggested that a lock in period of 1 year be kept between consumer switches. The regulators can review this lock in period later as required. High switching rates of consumers could create difficulties for retail supply companies in managing their power procurement and demand forecasting.

These issues regarding consumer switching would have to be detailed in the transfer scheme and roll out plans to be developed by individual states.

5. **Process for procurement of new PPAs:** while the new retail supply companies would have the option of forming new PPAs with generators, being small in size than the current discoms, the new retail supply companies may not have enough bargaining power to negotiate with bigger generators. In such cases the possibility of Intermediary Company acting as an aggregator for procuring power could be explored by states in their respective roll out plans and transfer schemes.
6. **Balancing and settlement:** After the introduction of retail supply competition, the Unscheduled Interchange charges would have to be calculated separately for each retail supply company in a license area and thus the mechanism of balancing and settlement would have to be defined for these new retail supply companies. There can be two approaches possible for the mechanism of balancing and settlement after the introduction of retail supply competition –
 - **Making Advanced Metering compulsory for new Retail Supply Companies** - Each new Retail Supply Company entering in the market would be asked to install Advanced Metering systems for new consumers that they acquire. This way the total power sale for this new Retail Supply Company can be metered on actual basis. With adding normative losses on the consumer sales, energy consumed by new retail supply companies can be arrived at. The energy consumed by incumbent retail supply company can be calculated by reducing the figures of new retail supply companies from the total energy consumed at distribution and transmission interface.
 - **Based on consumer category wise sample load curve** – under this approach, consumer category wise sample load curve is prepared based on the historical data. This load curve may vary for location and season. Based on the energy consumed by consumers of a category for a retail supply licensee, the load curve for that consumer category of the retail supply company is prepared. By adding the load curves of all consumer categories of the retail supply company, aggregate load curve of the retail supply company is prepared. This load curve is then used for balancing and settlement. The process of preparing the load curve would gradually improve as more data would be available regarding the energy consumption patterns of consumers. Also updation in load curves would be required as consumer behaviours change with time and seasons.

Since going forward, advanced metering would be required for better operational management and loss reduction, approach 1 of making Advanced Metering compulsory for new retail supply companies can be adopted. While adopting this approach may burden the new retail supply companies with higher metering costs, this risk would be known to any new retail supplier entering the business and thus can be suitably hedged for. As a transitional mechanism, as decided by the appropriate SERC, till such time

advanced metering is not available for all consumers, the balancing and settlement may be carried out using category wise sample load curves.

7. **Tariff setting mechanism for consumer open for competition:** in this stage after certain consumers are opened up for competition and new retail supply companies enter the market, the SERCs would have to determine a ceiling tariff for such contestable consumers. The retail supply companies would have to mandatorily offer a standard tariff plan charging this ceiling tariff and then along with it offer their other tariff plans. Since the incumbent retail supply company would have both contestable and non-contestable consumers, they would have to maintain separate financial accounts for them in order to file the Annual Revenue Requirement for serving the non-contestable consumers to the SERCs separately.
8. **Defining framework for Provider of Last Resort:** a retail supply company may fail to supply electricity to its consumers in case the supplier goes insolvent or has insufficient power available. In such cases the responsibility of supplying power to such consumers would fall upon the incumbent retail supply company. The transfer scheme and the roll out plan would have to detail whether the provider of last resort i.e. the incumbent retail supply company would be compensated based on the tariff charged to the consumer by failed retail supply company, competitive tariff, ceiling tariff or actual cost pass through to the consumers.
9. **USO extends to new retail supply companies:** After the introduction of second Retail Supply Company in an area of supply, while the duty to connect would still remain the responsibility of Distribution Company, whether duty to supply would be applicable on new Retail Supply Companies or will not be an issue. Based on the discussions with the FOR and the analysis of various pros and cons it is suggested that USO should be applicable on new retail supply companies as well.

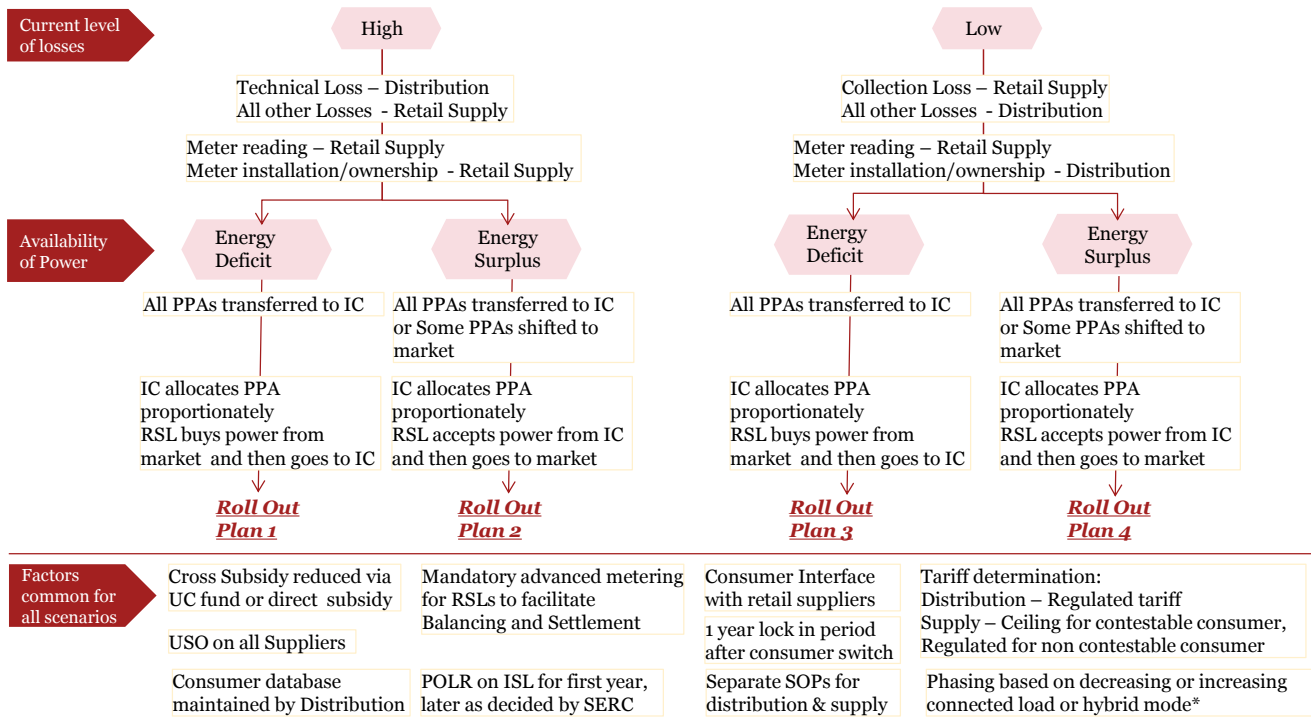
Alternative roll out plans for introduction of retail supply competition

As discussed the introduction of competition in retail sale of electricity, would require several tasks to be performed in three stages namely functional segregation of discoms, preparation for competition and onset of competition. However since the sector scenarios and contributing factors may vary from state to state in India and also the interpretation of these factors may vary, we have devised alternative roll out plans based on these variations.

Factors based on which various current scenarios can be defined, are as follows –

- **Current level of Transmission and Distribution (T&D) losses:** based on the current level of losses, the responsibility of AT&C losses is allocated between Distribution and Supply Functions. Further based on the loss allocation the metering responsibility is also given to either Retail Supply or Distribution functions. The possible scenarios for current level of losses are defined as follows -
 - **High** – where the T&D losses (AT&C Loss less collection inefficiency loss) are more than 15%
 - **Low** – where the T&D losses (AT&C Loss less collection inefficiency loss) are less than or equal to 15%
- **Availability of Power:** based on the availability levels of power in a state, the approach towards ‘Transfer of existing PPAs’ from current Discom to Intermediary Company and ‘Allocation of PPAs’ between retail supply companies are decided. The possible scenarios for availability of power are defined as follows -
 - **Energy Surplus** – where the current Discom has power procurement arrangements for *more* than its energy requirement
 - **Energy Deficit** – where the current Discom has power procurement arrangements for *less* than its energy requirement

Based on the permutation and combinations of these factors, 4 scenarios are defined and a roll out plan is devised for each of these scenarios.



*Caveat of phasing based on increasing connected load → Majority number of consumers would have connected load of less than 20 kW, opening competition to a large consumer base at a go. This coupled with USO, might be difficult to implement and become a non starter for reforms. As such a feasible option is to phase out based on decreasing load but with mandatory requirement of urban/rural consumer mix.

Overview

The Forum of Regulators (FOR) has been constituted by the Government of India in terms of Section 166 (2) of the Electricity Act, 2003. The Forum is responsible for harmonization, coordination and ensuring uniformity of approach amongst the Electricity Regulatory Commissions across the country, in order to achieve greater regulatory certainty in the electricity sector.

Ministry of Power proposed amendment to the Electricity Act, 2003 inter alia including separation of carriage and content in distribution sector giving choice to consumers to select the supplier for electricity. The roll out plan for carriage and content separation has, however, not been detailed in the proposed amendments.

The Ministry of Power requested the Forum of Regulators to evolve a model transfer scheme and at the same time provide different variations, so as to bring the desired clarity on the issues involved in implementing the framework. This would help facilitate the Ministry to suggest a “Model Scheme” for use by the States. PricewaterhouseCoopers Pvt. Ltd. (PwC) was appointed by FOR to assist in carrying out the tasks required for the study.

Objective of the study

The objective of this study is to develop a model transfer scheme for separation of carriage and content as envisaged in the Electricity (Amendment) Bill, 2014 for implementation by the States in India. As per the Terms of Reference, PwC was required prepare a detailed roll out plan for retail supply competition, which includes -

- Review existing literature on framework for separation of carriage and content;
- Suggest alternative variations for separation of network and supply business in distribution of electricity with due regard to the power sector scenario in India
- Develop a model framework for separation of carriage and content which inter alia includes, but is not limited to:
 - Clarity of roles and responsibilities across distribution network and supply businesses & the role of Intermediary Companies
 - Phasing of retail sale competition
 - Processes and stages of separation of distribution and supply business viz. functional segregation and physical segregation
 - Treatment of losses
 - Treatment of power purchase agreements
 - Treatment of Regulatory Assets
 - Treatment of cross-subsidies
 - Framework for consumer interface with licensees & Consumer Grievance Redressal Mechanism
 - Framework for “Provider of last resort”
 - Framework for compliance of Universal Service Obligation by the licensees
 - Mechanism to address cherry-picking by the supply licensees
 - Treatment of issues involving Open Access Consumers

- Establishment of performance standards for network and supply businesses
- Such other related issues

Approach adopted for completion of the assignment

In order to meet requirements of the Scope of Work, PwC, in consultation with the Forum of Regulators adopted the following phase wise approach for completion of the assignment.

Phase	Activities
Phase 1- Analysis	<ol style="list-style-type: none"> 1. Review of current status of competition in Indian Power Sector <ol style="list-style-type: none"> 1.1. Identification of issues in open access 1.2. Understanding of issues in areas with multiple distribution companies 2. Review of FOR report on ‘Introducing competition in Retail Electricity Supply in India’ – Study of major recommendations as per the report 3. Review of The Electricity (Amendment) Bill, 2014 to identify major changes in the sections that envisage the introduction of retail supply competition 4. Identification of issues for implementation of retail supply competition 5. Brief international review
	<p>Deliverable 1: Inception Report</p> <p>Based on the review and analysis performed during Phase 1 of this assignment, as discussed above, an Inception Report was prepared</p>
Phase 2- Recommendations	<ol style="list-style-type: none"> 1. Established objectives and guiding principles for introducing retail supply competition 2. Preparation of detailed stage wise plan for introduction of retail supply competition 3. Consultation with stakeholders for finalisation of roll out plan <ol style="list-style-type: none"> 3.1. Four brainstorming sessions were organised by FOR with various stakeholders from government and private sector 3.2. Comments and suggestions were received during these brainstorming sessions and also separately through written /verbal methods 4. Preparation of alternative roll out plans with various possible approaches towards issues, based on the current scenarios of power sector in Indian states
	<p>Deliverable 2: Draft Report</p> <p>The draft report included recommendations and the way forward on the basis of analysis carried out in Phase I & Phase II of the assignment</p> <p>Discussions were held with FOR and various other stakeholders identified on the recommendations of Draft Report</p>
	<p>Deliverable 3: Revised Report</p> <p>Based on the discussions with FOR secretariat, a revised report was submitted to FOR, with alterations as discussed.</p>

After the submission of revised report, we presented the findings of our study along with suggested recommendations before the FOR.

**Phase 3 –
Final
Report**

Deliverable 4 - Final Report

Based on the comments on the draft report, the final report is prepared and submitted

Details of Brainstorming Sessions held at FOR –

In order to get the views of various stakeholders on the implementation of retail supply competition, 4 brainstorming sessions were held at FOR where participants were invited from various sector players like state governments, electricity regulators, industry associations, distribution utilities, transmission companies, consumer groups, academicians etc.

Date of session	Participant	Organisation
06th May 2015	Chetan Bundela	Torrent Power
	S.K. Sonee, S.K. Aggarwal	POSO
	Dr. Anoop Singh	IIT Kanpur
	Neerja Verma	CEA
	Prafulla Varhade	MERC
	Prabir Neogi	CESC
	Praveer Sinha	TPDDL
	Sandeep Dhamija	TATA Power, New Delhi
	Rajarajeshwari Mishra	SBI Capital Markets
	Nidhi Sarin	British High Commission
	20th May 2015	Dr. Anoop Singh
Aditya Pyasi		BYPL
Daljit Singh		Independent Consultant Energy Policy
Prabir Neogi		CESC
Vivek Mishra, Kapil Sharma		Reliance Infrastructure
Shantanu Dixit		Prayas Energy Group, Pune
Rahul Tongia		Carnegie Mellon University, USA
Praveer Sinha		TPDDL
Sandeep Dhamija		TATA Power, New Delhi
Jonathan Brearley		Brearily Economics
Nidhi Sarin		British High Commission
Sanjeev Singhal		SBI Capital Markets
Vishal Anand, Poonam Verma		J. Sagar Associates
Debasish		West Bengal State Electricity Distribution Company
Neeraj Sati		Uttarakhand Electricity Regulatory Commission

Date of session	Participant	Organisation
04th June 2015	Narayan Swaroop Nigam	WSEDCL
	Rajat Misra	SBI Capital Markets
8th July 2015	Gopal Saxena	BSES
	Praveer Sinha	TPDDL
	I.C.P. Keshari	Principal Secretary (Power), Madhya Pradesh
	Devender Singh	Principal Secretary (Power), Haryana

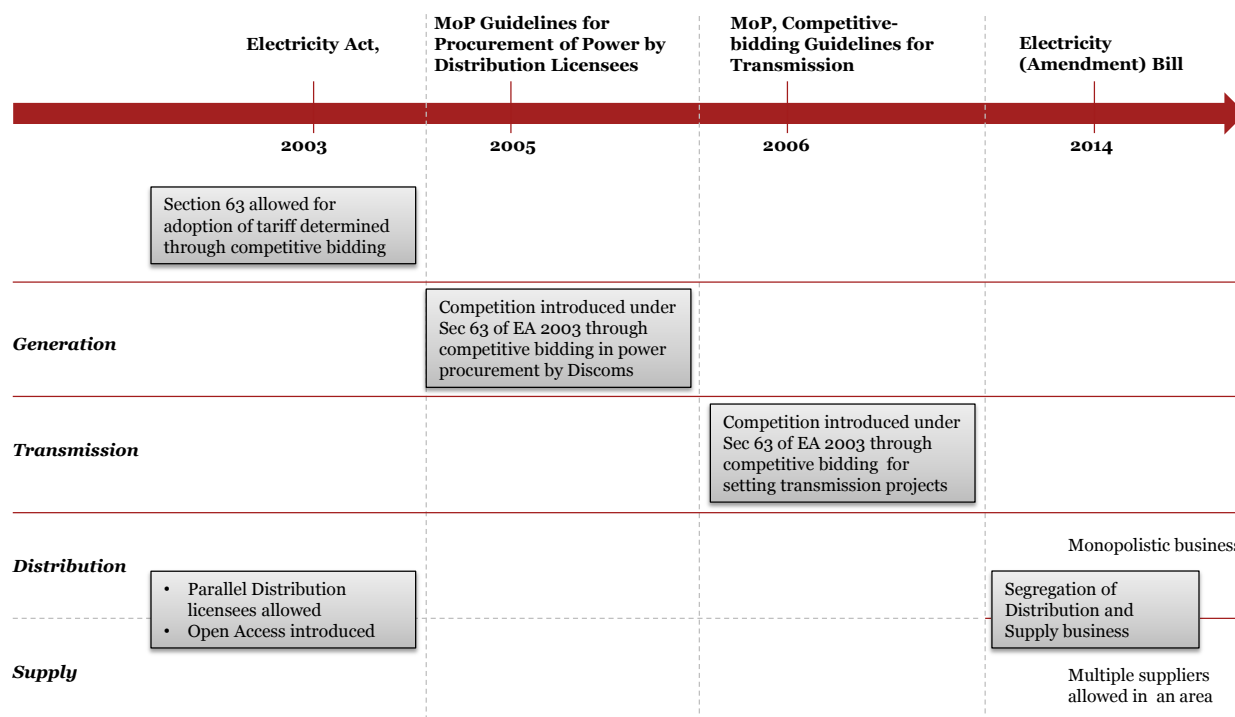
Draft report was presented to FOR on 10th June 2015 where views were received from various state regulatory commissions on the issues involved in implementation of retail supply competition. The comments and suggestions received from various state regulators have been incorporated in this final report.

Background of competition in India

Competition in Indian power sector

The Preamble to Electricity Act 2003 talks of promoting competition in electricity sector and the Act in its various provisions gives direction to the regulators to take necessary steps to promote competition in electricity sector. Key points related to competition, in the 4 major sectors of Electricity Industry are:

- i. **Generation** – competition in electricity sale by generation was introduced through the route of competitive bidding under section 63 of the Electricity Act 2003. Ministry of Power issued ‘Guidelines for Determination of Tariff by Bidding Process for Procurement of Power by Distribution Licensees’ in 2005 to promote competitive procurement of electricity by Discoms. The competitive tariffs at which Discoms buy power, puts backward pressure on generators to efficiently generate electricity at lowest possible costs.
- ii. **Transmission** – while the transmission business is inherently monopolistic in nature, competition was introduced in this sector by ‘Tariff based Competitive-bidding Guidelines for Transmission Service, 2006’ by Ministry of Power. The objective of these guidelines was to promote competitive procurement of transmission services through competitive bidding route under section 63 of the Electricity Act 2003.
- iii. **Distribution** – the Electricity Act 2003 allowed parallel distribution licensees in an area of supply, subject to approval by appropriate state regulators. The word ‘parallel’ signifies that the distribution licenses are required to setup their own distribution wire networks to supply electricity. Further Open Access was introduced which allowed generators to compete directly with distribution companies for supplying electricity to large consumers.
- iv. **Supply** – the Electricity Act 2003 did not identify Supply as a separate business but as a part of distribution itself.



Competition in Generation and Transmission sector

Following the enactment of the Electricity Act 2003, power generation was de-licensed and a number of fiscal and financial incentives were offered under various schemes such as Mega Power Policy and tax holiday. This attracted significant investments from private sector to leverage the demand-supply gap in the sector.

Subsequently, the Ministry of Power came out with competitive bidding guidelines for procurement of power in 2005, which allowed price discovery through market based mechanism. This ensured that private generation companies are allowed equal platform and opportunity to access the market as the public companies but most importantly it ensured competitive prices to benefit both, the consumers and the market.

Some of the key provisions of the 'Guidelines for Determination of Tariff by Bidding Process for Procurement of Power by Distribution Licensees, 2005' are:

'2.1. These guidelines are being issued under the provisions of Section 63 of the Electricity Act, 2003 for procurement of electricity by distribution licensees (Procurer) for:

- a) long-term procurement of electricity for a period of 7 years and above;*
- b) Medium term procurement for a period of upto 7 years but exceeding 1 year.*

4.1. For procurement of electricity under these guidelines, tariff shall be paid and settled for each payment period (not exceeding one month). A multi-part tariff structure featuring separate capacity and energy components of tariff shall ordinarily form the basis for bidding. However, for medium term procurement the procurer may, at his option, permit bids on a single part basis, and the same shall be clearly specified in the Request for Qualification (RFQ) / Request for Proposal (RFP).'

In 2006 similar competitive bidding guidelines were put in place for enabling competition in power transmission as well. Inter-state transmission projects were awarded under the competitive bidding regime. A number of states such as UP, Rajasthan, Madhya Pradesh, Haryana, Tamil Nadu and Odisha embraced competitive bidding in power transmission to enable private sector investments in the sector.

Key provisions of the 'Tariff based Competitive-bidding Guidelines for Transmission Service, 2006' are:

'2.1. These guidelines are being issued under the provisions of Section 63 of the Electricity Act, 2003 for procurement of transmission services for transmission of electricity.

2.4. Procurement of transmission services would include all activities related to survey, detailed project report formulation, arranging finance, project management, obtaining transmission license, obtaining right of way, necessary clearances, site identification, land compensation, design, engineering, equipment, material, construction, erection, testing and commissioning, maintenance and operation of transmission lines and/or substations and/or switching stations and/or HVDC links including terminal stations and HVDC transmission line.

7.1. For procurement of transmission services under these guidelines, transmission charges shall be paid and settled for each payment period (not exceeding one month). A transmission charge for providing transmission service and operation and maintenance required for the various transmission elements shall form the basis for bidding and evaluation. Tariff structure will have two components – one scaleable and the other non-scaleable. The scaleable component shall not be more than 15% of the non-scaleable component.'

Competition in Distribution sector

The Electricity Act, 2003 laid down the foundation for introducing competition at the consumer end through open access and provision for parallel Distribution licensees.

'14 Provided also that the Appropriate Commission may grant a licence to two or more persons for distribution of electricity through their own distribution system within the same area....'

However, the parallel licensee regime requires distribution licensees in an area to distribute power “through their own distribution system within the same area”. This has potential adverse consequences on tariff. Each distribution licensee investing in its own network would not only lead to replication of network but, in the event of capital investment being a pass-through expense, would also push up costs/tariffs for the end consumers.

Issues in Open Access

The concept of Open Access was introduced by The Electricity Act, 2003 however very few consumers have taken benefit of this. The Electricity (Amendment) Bill 2014 envisages the concept of open access to remain even after the introduction of retail supply competition. The set of reforms required for introduction of retail supply competition could resolve some of the issues afflicting open access as well. Some of these issues afflicting open access and benefits to be brought in by retail supply competition are:

- **High levels of Cross Subsidy:** In case subsidising consumers (like commercial or industrial consumer categories) purchase electricity through Open Access, the distribution companies are left only with subsidised consumers (like domestic and agricultural consumers). In such a scenario the distribution companies are left with no means to cover the cross subsidy benefit extended to subsidised consumers. Therefore this conflict of interest prevents distribution companies from promoting open access. A high amount of cross subsidy surcharge is charged from consumers who want to migrate from distribution companies to Open Access which acts as a deterrent for consumers to make use of Open Access.

The issue of cross subsidies is also an entry barrier for new retail supply companies. The effect of cross subsidies would have to be negated by tariff hikes, universal charge model, direct government subsidy or limiting the cross subsidy amount to wheeling charges. Regardless of the method adopted for negation of cross subsidies, at the end for all the consumers buying electricity from retail supply companies or through open access would attract same cross subsidies, therefore eliminating any conflict.

- **Repercussions of moving away from Discoms:** the fear of repercussions from distribution utility to which consumers have so far been connected acts as a deterrent for shifting to Open Access. The consumers fear the distribution utility may deny services like technical support, standby power in emergency etc.

After the separation of supply and distribution business, the distribution company would have no incentive to differentiate between a retail supply company and a generator wishing to supply through open access.

- **Lack of information access to small consumers:** Consumers, especially smaller commercial or industrial users, are often at a loss about the process of Open Access along with specifics such as which trader/generator to approach, etc.

Even after the introduction of retail supply competition, the consumers may still find it difficult to approach generators for Open Access. But the consumers would get multiple retail supply companies to choose from, which would give choice to consumers to move away from their Discoms.

- **Lack of incentive for generators:** The generators lack incentive to provide electricity to smaller industrial or commercial consumers through Open Access as it forces them to deal with multiple buyers on individual basis and reduced their financial security over a longer period of time. Further, through electricity exchange buyers can enter into only short term contracts, leading to uncertainty in future electricity prices for the consumers.

In a scenario with multiple retail supply companies in an area, the generators would also have option to tie up with various supply companies and not look out for smaller consumers on individual basis. This would not directly translate into open access regime but indirectly allow consumers to get better deals from generators.

- **Inappropriate estimation of Loss Levels:** The amount of technical loss levels loaded on open access consumers is based on estimates of the Discoms/Commission.

With the introduction of retail supply competition, the loss levels loaded on open access consumers would be same as that on other retail supply companies, therefore eliminating the conflict.

- **Lack of infrastructure:** Another key issue is the lack of adequate transmission and distribution infrastructure leading to congestions in the network.

With the separation of supply and distribution business, focussed investments will be possible by the distribution business in improvement of networks. The government owned distribution companies would be able to concentrate their capital investments plans towards strengthening the technical network while the private players coming in the retail supply sector would bring in increased investments into the consumer interface and operations.

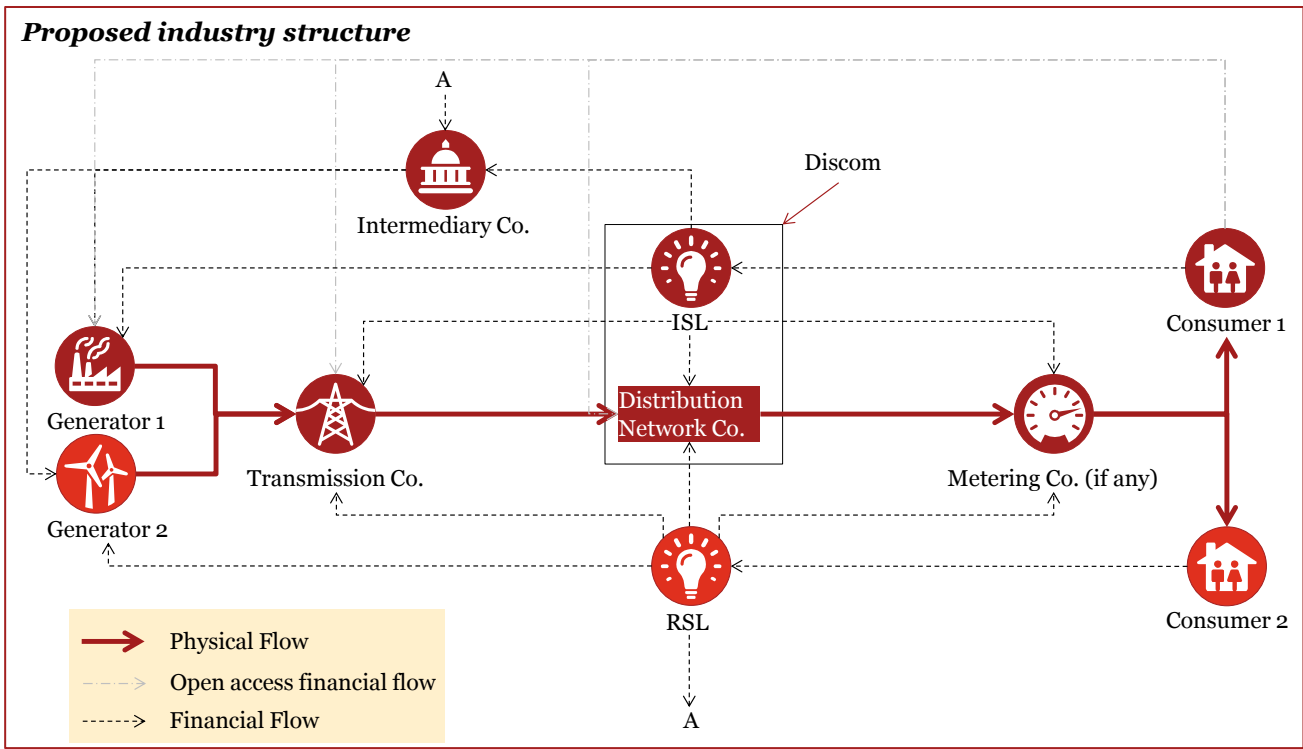
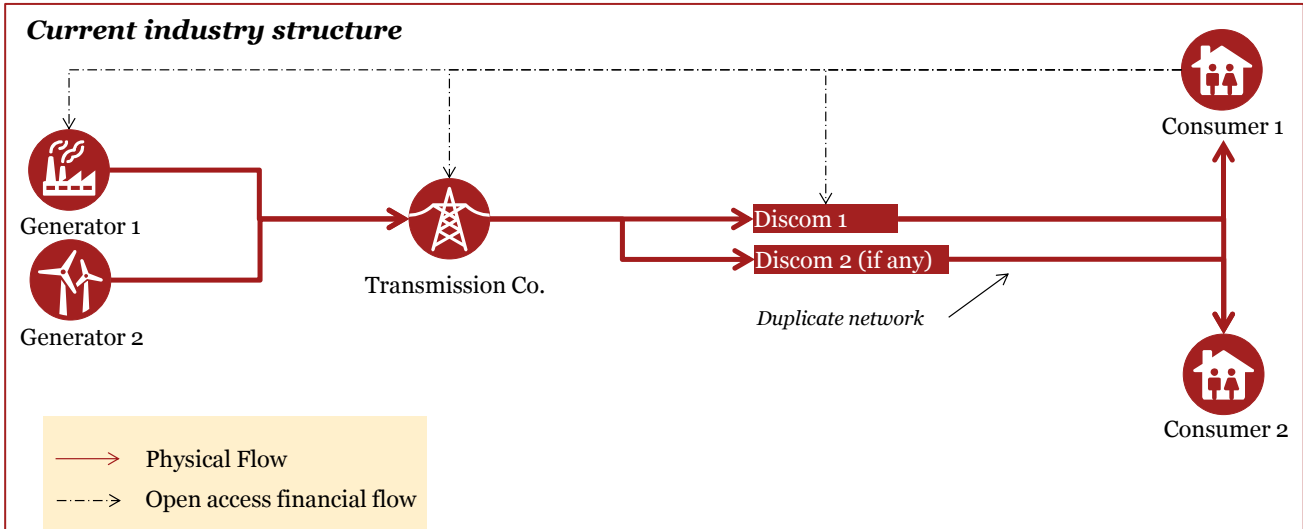
- **Non Availability of 24x7 power supply:** in a power deficit scenario, the prices of electricity generated are pushed up which in-turn erodes the extent of savings in power purchase cost that are envisaged through open access. Further even when the power is available in the market, the discoms find it difficult to purchase that power due to poor financial health.

With the introduction of overall reforms for retail supply competition, the financial health of both distribution companies and retail supply companies would improve. The private players entering the retail supply side of the business would be better equipped in terms of investment and technology to reduce commercial losses and make financial profits. This would in turn increase their power purchasing capacity and thus increase the availability of power.

Competition in supply side of Distribution business

The business of Distribution companies (Discoms) can be segregated into – carriage (distribution) business and content (retail supply) business. Retail supply involves the service side of the business like purchase of electricity from generators, selling electricity to consumers, customer services, billing, and collection of charges from consumers. On the other hand the Distribution business involves the technical side of the business like setting up of physical network in order to wheel electricity to consumer premises. While the Distribution business is monopolistic in nature, the Electricity (Amendment) Bill 2014 envisages introducing competition in retail supply side of the Discom's business. For achieving this the existing distribution company needs to be segregated into a distribution and a retail supply business⁵. Section 14 of The Electricity (Amendment) Bill 2014 provides for multiple retail supply companies in an area of supply. These multiple retail supply companies would then compete with each other for supplying electricity to consumers. Further section 12 of The Electricity (Amendment) Bill 2014 says that The Appropriate Commission shall not grant licence to more than one distribution licensee in any area of distribution in areas. In areas where two or more distribution businesses co-exist, they can continue to operate till the expiry of their licenses.

⁵ The retail supply company formed by segregating the current Discom is referred to as 'incumbent retail supply company' while any other retail supply company competing with it is referred to as 'new retail supply company'.



Introduction

Objectives of introducing retail supply competition

It is imperative to conceptualise broad objectives of introducing retail supply competition. These objectives would serve as the guiding blocks to evaluate the possible approaches towards resolution of various issues in retail supply competition. The objectives for introducing retail supply competition in Indian electricity sector are:

Objective	Benefits derived from retail supply competition
<i>Improvement in efficiency and loss reduction</i>	The licensees can focus on their respective responsibilities. distribution company would focus entirely on technical and operational efficiency, while the retail supplier would focus entirely on power procurement and consumer interface
<i>To give choice to consumers</i>	Choice allows consumers to differentiate between suppliers on the parameters like quality of supply, supply tariffs and customer service. This in turn would put pressure on supply companies to provide better services.
<i>Improved access and availability of power</i>	Owing to focused investments of distribution in network upgradation and increased efficiencies in power procurement by retail supply companies, in the long run power availability to consumers will improve.
<i>Efficient power procurement</i>	In order to capture a greater market share in their supply area, the retail supply companies would work towards improving efficiency in power procurement.

Each individual State Government while forming the transfer scheme would have to identify the key objective of introducing retail supply competition, depending upon the current electricity scenario in their respective states. This key objective would serve as the driving force for the introduction of retail supply competition in their state. For example in states like Bihar Jharkhand or Odisha where current levels of AT&C losses is on the higher side, the key objective could be 'Improvement in efficiency and loss reduction'. On the other hand in states like Delhi where current level of losses is on the lower side but cost of power procurement is high, the key objective could be 'Efficient power procurement'.

As various states would have different objectives to introduce retail supply competition, the roll out plan required to achieve that objective would also differ. Later in this report under the section 'Alternative roll out plans for introduction of retail supply competition', for each roll out plan the key objective/driving force is defined which can be achieved with the help of that roll out plan.

FOR report on 'Introducing competition in retail electricity supply in India'

In June 2013, Forum of Regulators came up with a study report on introducing competition in retail segment of India. The report discussed in detail the following:

- Status of competition across various segments of the Indian power sector
- Issues plaguing customer choice and competition in Distribution sector

- Five international case studies in retail supply competition
- Brief discussion of Indian case studies viz. Maharashtra model of parallel licensees and electricity supply to Special Economic Zones in Gujarat and Kerala
- Blueprint for introducing retail competition in India (including pre-requisites and risk factors for introducing retail supply competition in India)

Some of the major findings and recommendations of this study report on Retail Supply Competition were –

1. Development of a Wholesale Market

Retail competition, in context of international experience and also with relevance to the existing scenario in India, is a stage of reforms that typically requires the state of affairs in the power sector to be already liberalized to a great extent, and in particular requires a well-functioning wholesale market. Countries which have successfully adopted a competitive retail supply model ensured that a robust wholesale market was in place before opening up the retail supply sector. The following are requisites for market design –

- Reducing dominant market power in generation: to ensure there are many players in the market and no player has a dominant position, enough to manipulate the market
- Creation of voluntary public wholesale spot energy and operating reserve market institutions
- Development of Ancillary Market: the resources required for reliable operation have been treated as an ancillary service that the system operator has to obtain from other industry participants. The Electricity (Amendment) Bill 2014 defines ancillary services as – ‘in relation to power system or grid operation, means the services necessary to support the power system or grid operation for maintaining power quality, reliability and security of the grid.’

2. Cost Reflective Tariffs

Currently in India, tariffs are designed keeping socio-economic considerations in mind. Domestic and agricultural consumers pay tariffs lower than the actual cost of supplying power, therefore getting cross-subsidized by commercial and industrial consumers who typically pay tariffs higher than their cost of supply. If commercial and industrial consumers move away to other retail suppliers, the incumbent retail supply company would suffer a loss, because significant cross subsidies would get eroded. Also existence of cross subsidies would encourage cherry picking among retail suppliers, who would want to attract consumers who are paying more than their cost of supply. Therefore the following steps are required before the introduction of retail supply competition -

- Determination of voltage wise and category wise cost of supply so as to accurately identify amount of cross subsidy existing between consumer categories
- Gradual reduction of cross subsidies following a trajectory over a time period

3. Treatment of existing distribution and financial losses

Before designing any model for separation of the distribution and retail supply businesses, consensus needs to be built on the treatment of distribution losses in supply of power, and current financial losses on the books of accounts of existing distribution companies. Following steps are required before the introduction of retail supply competition -

- Segregation of accounts and preparation of separate accounts for the distribution and retail supply businesses
- Existing distribution losses of distribution companies need to be assessed and classified into technical and commercial losses accurately which can then be allocated between distribution and retail supply respectively

-
- All technical losses may be allocated to the incumbent Distribution network operator since these losses are on account of technical parameters
 - Commercial losses that arise on account of various issues such as faulty meters, non-metering, meter bypassing, etc. may be attributed to the retailers
 - Special Purpose Vehicle (SPV) may be created to take over all recognised financial losses of the Discoms
 - Regulatory Surcharge can be levied on all consumers (of incumbent Discom as well as competitive supply retailers) which would go towards the SPV

4. Suitable supply infrastructure

Separation of distribution and retail supply of electricity would require advanced metering for consumers in the competitive segment of the market because in the absence of separate meters and till the time that sufficient power availability is attained, imposition of load restrictions by the incumbent Discom would needlessly impact competitive market customers and vice versa. Therefore distribution utilities would require advanced metering for consumers in the competitive segment of the market. Considering the huge cost and time involved, there might be several practical issues involved in ensuring advanced metering for all consumers. Therefore, keeping in view transitional requirements, three approaches may be considered in this regard:

- As a transitional approach consumers in the competitive market segment may take supply from any of the retail suppliers, irrespective of the their connected feeder, if they are willing to undergo load restrictions announced in advance by retail suppliers
- Meters should be separated for the concerned consumer segment by the time competition is introduced for that consumer segment
- Advanced metering may be completed for various segments of the market as and when they are opened up to competition in a phased manner

5. Segregation of ownership of the distribution (wire) and retail supply functions

One potential distribution sector reform is the segregation of ownership of the distribution (wire) and retail supply functions. This is necessary before the introduction of retail supply competition because of -

- Need to bring in neutrality in the Distribution network by separating the Distribution and Retail Supply functions, as consumer choice is bottlenecked without such neutrality due to prevailing cross subsidies
- Encourage investment in distribution networks by making the distribution business a distinct, regulated business with assured returns
- Focussed efforts at efficiency improvement – Distribution company to focus on technical losses while Retail Supply company to focus on Commercial losses

6. Phased approach with clear milestones

Based on preliminary discussions, study and analysis of the sector environment, a timeline was suggested for the introduction of retail supply competition in India, in line with the mandate of this advisory assignment. The broad phases suggested were as follows –

	Activity	Timeline
Step 1	Separation of accounts and employees	0 – 2 years
Step 2	<ol style="list-style-type: none"> 1. Two separate licences (with same ownership) 2. Transfer of PPAs to Supply Licensee 3. Tariff Determination 4. Development of Capacity Market – Medium Term 	
Step 3	Invite Applications for second/subsequent supply license	1 year from completion of step 1 and step 2
Step 4	<ol style="list-style-type: none"> 1. Ownership separation of network and supply businesses 2. Introduction of second retail supply licensee 3. Tariff determination for consumer open to competition 	3 year from completion of step 3
Step 5	Extension of retail supply competition to include all consumers in phased manner	6 th year onwards

7. Standards of Performance

The current Standards of Performance would have to be segregated between the distribution and supply businesses. In the initial stages of retail competition, Standards of Performance would continue to be imposed on all the players including competitive retail supplier(s). With time, once the competitive retail market is deemed to be sufficiently evolved, Standards of Performance may be withdrawn since competition itself would demand and foster quality supply and good performance standards.

Critical Review of Electricity (Amendment) Bill, 2014

The Electricity (Amendment) Bill, 2014 envisages to promote competition in retail electricity supply through separation of carriage (distribution) and content (retail) business. While the Electricity Act, 2003 had provisions for allowing competition in Retail Supply, it did not distinguish between Distribution licensee and Supply licence. The Electricity (Amendment) Bill, 2014 provides for Supply Licensee under Section 12 of Part IV.

Electricity Act, 2003		Electricity (Amendment) Bill, 2014	
Section 12 of Part IV	<p><i>No person shall</i></p> <p>(a) transmit electricity; or</p> <p>(b) distribute electricity; or</p> <p>(c) undertake trading in electricity,</p> <p>unless he is authorized to do so by a license issued under section 14, or is exempt under section 13</p>	Section 12 of Part IV	<p><i>No person shall</i></p> <p>(a) transmit electricity; or</p> <p>(b) distribute electricity; or</p> <p>(c) undertake trading in electricity, <i>or</i></p> <p><u>(d) supply of electricity to consumer</u></p> <p>unless he is authorized to do so by a license issued under section 14, or is exempt under section 13</p>

Under section 2 of the Electricity (Amendment) Bill 2014, the following definitions have been added/modified -

- **Area of Distribution and Area of Supply –**

‘Area of distribution’ means the area within which a distribution licensee is authorised by his licence to distribute electricity.’

‘Area of supply’ means the area within which a supply licensee is authorised by his licence to supply electricity.’

- **Supply Licensee -**

‘Supply licensee’ means a person authorised under section 14 to supply electricity to consumers and shall also include, incumbent supply licensee.’

- **Provider of Last Resort –**

‘Provider of last resort’ means the supply licensee who from time to time is designated by the Appropriate Commission.’

While Section 43 of the Electricity Act 2003 placed Duty to Supply consumers on Discoms, the Electricity (Amendment) Bill 2014 changes that to Duty to Connect consumers, as follows –

Electricity Act, 2003		Electricity (Amendment) Bill, 2014	
Section 43	<p>Duty to Supply on request</p> <p>‘ Save as otherwise provided in this Act, every distribution licensee, shall, on an application by the owner or occupier of any premises, give supply of electricity to such premises, within</p>	Section 43	<p>Duty to Connect on request</p> <p>‘ Save as otherwise provided in this Act, every distribution licensee, shall, on an application by the owner or occupier of any premises <u>in the area of distribution</u>, give <u>connection</u> to such premises <u>to</u></p>

Electricity Act, 2003	Electricity (Amendment) Bill, 2014
<i>one month after receipt of the application requiring such supply'</i>	<i>enable supply of electricity, within fifteen days after receipt of the application requiring such supply'</i>

The Electricity Act, 2003 allowed for multiple Distribution licensees in an area. This is amended in Electricity (Amendment) Bill, 2014 which allows a single Distribution licensee in an area with multiple supply licensees.

Electricity Act, 2003	Electricity (Amendment) Bill, 2014
Section 14 <i>Provided also that the Appropriate Commission may grant a licensee to two or more persons for distribution of electricity through their own distribution system within the same area, subject to the conditions that the applicant for grant of license within the same area</i>	Section 14 <i>....Provided also that the Appropriate Commission may grant a licensee to two or more persons for supply of electricity through their own distribution system within the same area of supply, progressively as may , subject to the conditions.....</i>
	Section 12 <i>The Appropriate Commission shall not grant licence to more than one distribution licensee in any area of distribution: Provided that where two or more distribution licensees within the same area of distribution are existing on the date of the commencement of the Electricity (Amendment) Act, 2014, they shall continue their operation till such period as specified in their licence.</i>

In the Mumbai region of the Maharashtra state, four distribution licensees i.e. BEST, RInfra-D, MSEDCL and TPC-D hold the licence to distribute electricity within the areas specified in their respective licences. While BEST, RInfra-D, and MSEDCL operate within specific distribution licence areas allocated to them, distinct from each other, TPC-D, on account of its historical background and the Supreme Court judgment delivered on 8th July, 2008, is licensed to distribute power in the entire Mumbai region excluding the Mira-Bhayander area served by RInfra-D and excluding all the areas served by MSEDCL. The treatment of such a distribution system under section 12 of the Electricity (Amendment) Bill, 2014 would have to be deliberated in the transfer scheme of the state of Maharashtra.

Intermediary Company

The Electricity (Amendment) Bill, 2014 introduces the concept of 'Intermediary Company'. This entity will succeed the existing PPAs and procurement arrangements of the current discoms and allocate them between various retail supply companies accordingly.

'Section 2 35B) "intermediary company" means the entity succeeding to the existing power purchase agreements and procurement arrangements of the relevant distribution licensees on reorganisation as per subsection (4A) of section 131 and discharging such other functions as may be assigned to it in terms of the provisions of the Act.'

The Electricity (Amendment) Bill, 2014 further gives Central Government flexibility to define the roles and responsibilities of the Intermediary Companies.

'Section 131 4C) The functions of the intermediary company shall be as prescribed by the Central government.'

Transfer Scheme

In Section 131 of The Electricity (Amendment) Bill 2014, sub-sections 4A) and 4B) are added which discuss the issue of transfer scheme from Distribution Companies to Retail Supply Companies.

'Section 131, 4A) The State Government shall within the period specified under section 51A draw up a transfer scheme for transfer of such of the functions, the property, interest in property, rights and liabilities of the distribution licensees relating to supply of electricity to a company who shall be the incumbent supply licensee for the concerned area of supply and so far as the existing Power Purchase Agreements and procurement arrangements, to which the distribution licensee is the beneficiary in the intermediary company and publish such scheme as statutory transfer scheme under the Act.'

'Section 131 4B) The distribution licensee shall cease to be charged with and shall not perform the functions and duties under this Act to the extent of the transfers made under sub clause (a) on and after the effective date of such transfer.'

However it is not clear from the bill whether State Governments would also have power to define a transfer scheme for private distribution companies also or not. As per the discussions with FOR, it is envisaged that the state government would develop transfer scheme for state discoms only.

Metering

Section 55 of The Electricity Act 2003 as well as The Electricity (Amendment) Bill 2014, states that a licensee after a period of two years from appointed date, cannot supply electricity without installation of a meter. The appointed date can further be extended by the SERCs.

'Section 55 (1) No licensee shall supply electricity, after the expiry of two years from the appointed date, except through installation of a correct meter in accordance with the regulations to be made in this behalf by the Authority:'

....PROVIDED FURTHER that the State Commission may, by notification, extend the said period of two years for a class or classes of persons or for such area as may be specified in that notification.'

Further Section 55 of The Electricity (Amendment) Bill 2014 states that –

' Provided that smart meters, as specified by the Authority, shall be installed at each stage for proper accounting and measurement for the purpose of metering and consumption from the point of generation up to such consumers who consume more than the quantity of electricity in a month as prescribed by the Central Government.'

Structure of the report

The following report is divided into three sections as follows –

- 1. Stages of introducing retail supply competition:** this section discusses the various tasks that need to be performed in order to ensure successful implementation of retail supply competition. These tasks are divided into three stages to be implemented in succession, where tasks performed in previous stage prepare the groundwork for the next stage of tasks. Also several logical approaches to implement each of these tasks are discussed in this report, along with their pros and cons.

Some of the tasks discussed are non-critical i.e. the approach adopted to complete these tasks does not affect the overall implementation of the retail supply competition, provided the task is completed successfully. For such tasks, based on the sector scenario and views of stakeholders, decision would have to be taken to select an appropriate approach. Such decision points are highlighted in a box.

On the other hand there are certain tasks which can be termed as critical issues. Such issues are interdependent upon each other and approach adopted towards them could affect the overall implementation of retail supply competition. Such critical issues that may arise during implementation of retail supply competition are highlighted in a box. These issues are then discussed in detail in the next section of the report.

- 2. Issues in implementation of retail supply competition:** this section discusses in detail the critical issues identified. The possible approaches to resolve these issues are then objectively analysed based on various contributing factors and state scenarios. This analysis also discusses the interdependence of issues by explaining the effects of approach adopted towards one issue resolution on the possible approaches for other issues.
- 3. Alternative roll out plans:** this section of the report formulates the alternative roll out plans wherein each roll out plan has a separate combination of the approach adopted towards major issues. The states or regulators can choose upon the most suitable roll out plans for their respective state scenarios.

Stages of introducing retail supply competition

In order to ensure smooth transition of electricity market into retail supply competition, a three stage implementation process of the roll out plan is suggested as follows,

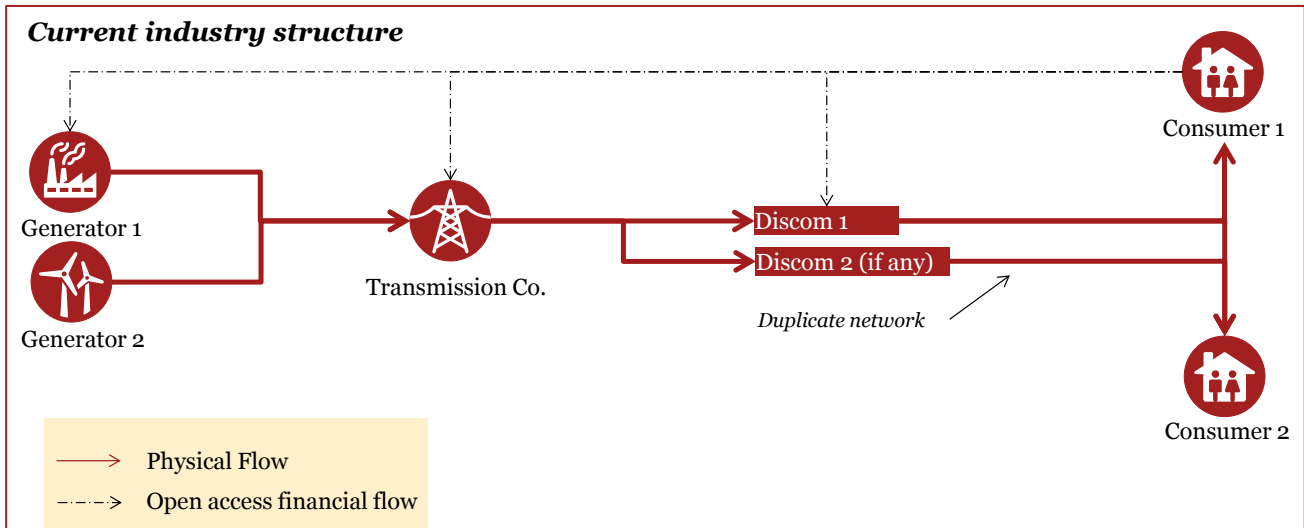
Stage		Time period to complete
1	Functional Segregation of Discoms: In this stage, the current Discoms would be segregated into Distribution and Retail Supply functions. Their individual roles and responsibilities will be defined and they would be equipped with enough financial and manpower resources to take on those roles.	1 - 2 year(s)
2	Preparation for Competition: In this stage the, steps would be taken to make the market conducive for retail supply competition like ownership segregation, cross subsidy reduction, upgradation of metering, loss allocation etc. Entry barriers would be removed in order to create a level playing field for all and encourage competition.	Start: after stage 1 objectives are achieved Completion time: 2-3 years after completion of Stage 1
3	Onset of Competition: New Retail Supply Licenses would be given in this stage in order to give retail consumer choice. The market would be opened up for competition in phases i.e. initially certain set of consumers would be open to competition and then gradually other consumers will be brought under the purview of competition.	Start: after stage 2 objectives are achieved This stage will be an ongoing activity till the time all consumers are open for competition

Stage 1: Functional segregation of Discoms

In this stage, steps will have to be taken for the functional segregation of current Discoms into distribution and retail supply functions. During this stage, the distribution and retail supply functions would operate as separate entities, but they would be separated by a virtual Chinese Wall under the same ownership. Roles and responsibilities will have to be defined for these new functions as per the changed sector scenario. Also a transfer scheme will have to be developed for segregation of assets, liabilities and human resource between the successor entities.

Industry Structure at the beginning of Stage 1

Under the current industry structure i.e. before the implementation of stage 1 of roll out plan, the discoms carry out both the content and carriage business. The discoms purchase electricity from the generators, wheel this electricity from the transmission network till the premises of consumer and sell it to consumers.



Key tasks required to be carried out in the stage

1. Defining new functional entities
2. Defining Roles and Responsibilities of new entities
3. Treatment of existing financial losses
4. Treatment of existing PPAs
5. Defining framework for Consumer Interface
6. Defining framework for Consumer Grievance Redressal Mechanism
7. Segregation of Standards of Performance between entities
8. Universal Service Obligation on supply/network licenses
9. Tariff setting mechanism for new entities
10. Balance sheet segregation of current Distribution business among new entities. This task can be further sub-divided into smaller tasks as follows -
 - Valuation and allocation of assets (long term and current)
 - Valuation and allocation of liabilities (long term and current)
11. Human resource planning
12. Technical studies of as-is condition

Description of the tasks along with various possible approaches for each of the task

1. Defining new functional entities

Under current scenario, the discom has the responsibility to purchase electricity from generators, wheel it through its network and supply it to retail consumers. While the technical part of this business i.e. wheeling of electricity to the consumer premises is monopolistic in nature, the Electricity (Amendment) Bill 2014 envisages introducing competition in retail supply side of the Discom's business. For achieving this, the functions of current discoms would have to be split as follows -

- ii. **Distribution business:** This functional entity would wheel electricity via its network to the premises of the retail consumer.

Issue – The distribution function can further be broken down into several sub functions like:

- Distribution Market Operations (DMO)
- Distribution Network Operations (DNO)
- Distribution Planning Operations (DPO)
- Distribution System Operations (DSO)

These are discussed in the section ‘Issues in implementation of retail supply competition’ under the heading ‘Defining roles and responsibilities of new entities’.

- iii. **Retail Supply business:** this functional entity would purchase power from generators and sell it to retail consumers.
- iv. **Intermediary Company:** This functional entity will succeed the existing PPAs and procurement arrangements of discoms and allocate them between various retail suppliers. Besides this the Intermediary Company could carry out tasks common to all retail suppliers or tasks that require a neutral approach towards various industry players. For e.g. tasks like collection of Universal Charge from all consumers which can be used for amortisation of regulatory assets.

🔊 **Decision Point** – *formation of intermediary company*

While section 2 35B) of the Electricity (Amendment) Bill 2014 defines the role of Intermediary Company, the bill is silent on the following issues regarding its formation –

1. **Jurisdiction of Intermediary Company:** it needs to be deliberated that in states like Madhya Pradesh, Delhi, Haryana etc. where multiple discoms exist in the state with segregated area of supplies, whether a common intermediary company would be formed for the entire state or an Intermediary Company would be formed for each of the current Discoms. Since these power sector reforms are at electricity distribution level, which is a state subject under the federal structure of India, formation of a regional or a national level Intermediary Company would be a challenge. Possible approaches for the jurisdiction of Intermediary Company can be as follows –
 - **State Wide Intermediary Company** – single intermediary company for the entire state. For e.g. although Haryana has two Discoms, UHBVN and DHBVN, the state could have a single intermediary company with jurisdiction over the entire state.
 - **Discom wise Intermediary Company** – one intermediary company for each of the current Discom. For e.g. since Haryana has two Discoms, UHBVN and DHBVN, the state could have two intermediary companies with jurisdiction over area of supply of UHBVN and DHBVN respectively.

Since one of the major responsibilities of the Intermediary Company is to assume responsibility for the existing PPAs of discoms, states where the power procurement is centralised, a single state wide Intermediary Company could be formed. For e.g. in Madhya Pradesh, while multiple discoms exist in the state with each having its own area of supply, their power procurement is still centralised and therefore all of their PPAs can be transferred to a single Intermediary Company. On the other hand where multiple discoms operating in a state have their separate PPAs, the possibility of Discom wise Intermediary Company can be explored. As

per the discussions with FOR, it is envisaged that there be a single state wide Intermediary Company which would take over PPAs of all discoms in the state.

2. **Ownership of Intermediary Company:** it needs to be deliberated whether the Intermediary Company formed will be owned by Government or can it be owned by Private players. In states like Delhi, where all discoms are privately owned, the formation of a Government owned Intermediary Company would require formation of a new company rather than segregation from a current discom. As per the discussions with FOR, it is envisaged that the Intermediary Company could be State Government owned.
3. **Payment Obligations of PPAs:** it needs to be deliberated whether the Intermediary Company would settle the payments between Generators and Retail Supply Companies itself i.e. act like a clearing house or will it just allocate the PPAs/power between Retail Supply Companies and leave it on them to make necessary payments to generators.

The pros and cons of these approaches for the discussion points are as follows –

Approach	Pros	Cons
Jurisdiction of Intermediary Company		
State Wide	<ul style="list-style-type: none"> • Inter-regional activities: a state wide intermediary company would be able to handle activities like inter-regional cross subsidies prevailing in a state. • Ease in conducting business: a single intermediary company in state could face lesser operational or regulatory hurdles. 	<ul style="list-style-type: none"> • Separate accounting for treatment of PPAs and regulatory assets of each Discom: the PPAs and the regulatory assets of one discom may vary significantly from other discoms. A state wide intermediary company would have to maintain separate accounts for each of the Discom (for PPAs and Regulatory assets) so as to calculate cost of PPA allocation and universal charge for amortisation of Regulatory Assets in area of supply.
Discom wise	<ul style="list-style-type: none"> • Ease in formation: in states where single discom exists in an area of supply, the intermediary company could be formed from each discom separately. • Separate treatment of PPAs of each Discom: the PPA duration, cost or type of PPAs of one discom could differ substantially from the PPAs of other discoms. This could be taken care of with discom wise Intermediary Companies. 	<ul style="list-style-type: none"> • Treatment for area of supply with parallel discoms: in areas where parallel discoms exist in an area of supply, for e.g. in the area of Mumbai, multiple intermediary companies in an area of supply cannot be formed. A mechanism would have to be developed for a combined intermediary company in such areas. • Mechanism for inter-regional activities: a mechanism would have to be developed between intermediary companies for treatment of inter-regional activities.
Ownership of Intermediary Company		
Government	Financial support from state: regarding the treatment of cross subsidies or accumulated losses, a Government	Political Interference: political interference could affect issues like treatment of cross subsidies or

Approach	Pros	Cons
	owned Intermediary Company could get financial backing of state government.	amortisation of accumulated losses via collection of a Universal Charge.
Private	No Political Interference: a privately owned Intermediary Company might be independent of political motivations.	Limited support from State: It would be difficult for a private company to get financial or regulatory support from the State Government.
Payment obligations of PPAs		
Intermediary company acts as clearing house	Generators and lenders are protected even if the Intermediary Company fails to collect revenue from Retail Supply Company.	Intermediary Company does not have assets to make guarantees to generators. This would put financial burden on State Government.
Supplier pay directly to generators	Suppliers would like to ensure timely revenue collection from retail consumers in order to pay generators on time.	Generators could face the brunt if Intermediary Company and Retail Supply Company enter into dispute over allocation of PPAs.

- v. **Metering:** Metering is one of the most important activity affecting the commercial side of electricity supply business. Several activities like commercial loss reduction, demand side management etc. are dependent upon the level of metering and the type of meters installed in a license area. The metering service can be broken down into following activities -
- Meter reading:** going to consumer premises to record the meter reading or using data communication services (in case of meters supporting this feature) for collecting meter reading data.
 - Other Meter related activities:** Meter installation/replacement, ownership of metering assets, meter operations and testing.

After segregation of current discom into Distribution and Retail Supply functions, the responsibility of metering services can be given to Distribution business, Retail Supply business or it could also be given to a 3rd Party Company⁶, depending upon the allocation of responsibility of technical and commercial losses.

Issue – Metering services involves several activities like installation of meters, operation of meters, meter reading, data communication etc. Each of these activities could be taken care by Supply Company, Distribution Company or a 3rd Party Company. The issue of metering is closely associated with how losses are allocated between segregated entities and therefore this issue is discussed in detail in section ‘Issues in implementation of retail supply competition’ under the heading ‘Metering Services’.

In this stage of the roll out plan, the license area for both Distribution Business and Retail Supply Business would remain same as of the incumbent Discom from which these new entities are formed.

As the number of players in the industry would increase after introduction of retail supply competition, and the complexity of energy flows may increase, capacity building would have to be done for SLDCs and SERCs in order to prepare them for the increased responsibilities.

⁶ Although The Electricity (Amendment) Bill 2014 does not mention Metering as a licensed activity, for the purpose of illustrating various possibilities, this report assumes that in case a 3rd party company is brought in the sector for the metering activities, it would be a licensed activity and regulated by appropriate electricity regulatory commission.

2. Defining Roles and Responsibilities of new entities

The Electricity (Amendment) Bill, 2014 discusses the duties and powers of a Distribution and Supply licensee. A detailed list of Roles and Responsibilities for each of these businesses after the introduction of retail supply competition would have to be developed.

Boundary of Separation between Distribution and Retail Supply Businesses: The Electricity (Amendment) Bill 2014 while discussing about the separation of Distribution and Retail Supply businesses, is silent on the boundary/physical separation between them. Based on discussions with various stakeholders and FOR, Metering at consumer premises is taken as the boundary of separation between the Distribution and Supply businesses.

Based on the boundary of separation between the businesses, there are some roles and responsibilities which can be clearly allocated between the separate businesses. However some of the roles fall in grey area as to who would be responsible for them. Such ambiguous roles and responsibilities would become clear as approach towards various other issues are finalised. The roles and responsibilities of the respective entities are:

Business	Segregated Roles and Responsibilities	Ambiguous roles
Distribution business (Network Operations)	<ul style="list-style-type: none"> • Providing neutral access to its network • Expansion and strengthening of network • Operation and maintenance of the network such as network reinforcement and replacement, improved overhead line repair, etc. • Maintaining 24x7 network availability • Reduction in Technical losses (since the network is owned by distribution business, irrespective of other issues, the responsibility of technical losses would lie with distribution business) • Co-ordination with retail supply companies for new connection release, change in consumer load and disconnection • Fault restoration • Fulfilling regulatory obligations for distribution in tariff determination and efficiency targets 	<ul style="list-style-type: none"> • Consumer Interface • Commercial loss reduction
Distribution Planning Operations	<ul style="list-style-type: none"> • Co-ordination with transmission utility for network planning 	
Distribution Market Operations	<ul style="list-style-type: none"> • Accounting for the energy scheduled, despatched to retail supply companies • Balancing and Settlement • Distribution loss calculation 	
Distribution System Operations	<ul style="list-style-type: none"> • Monitoring of the distribution network operations, supervision and control • Real time operation for distribution network control and despatch • Ensure integrated operation with other entities for maximum operational efficiency 	

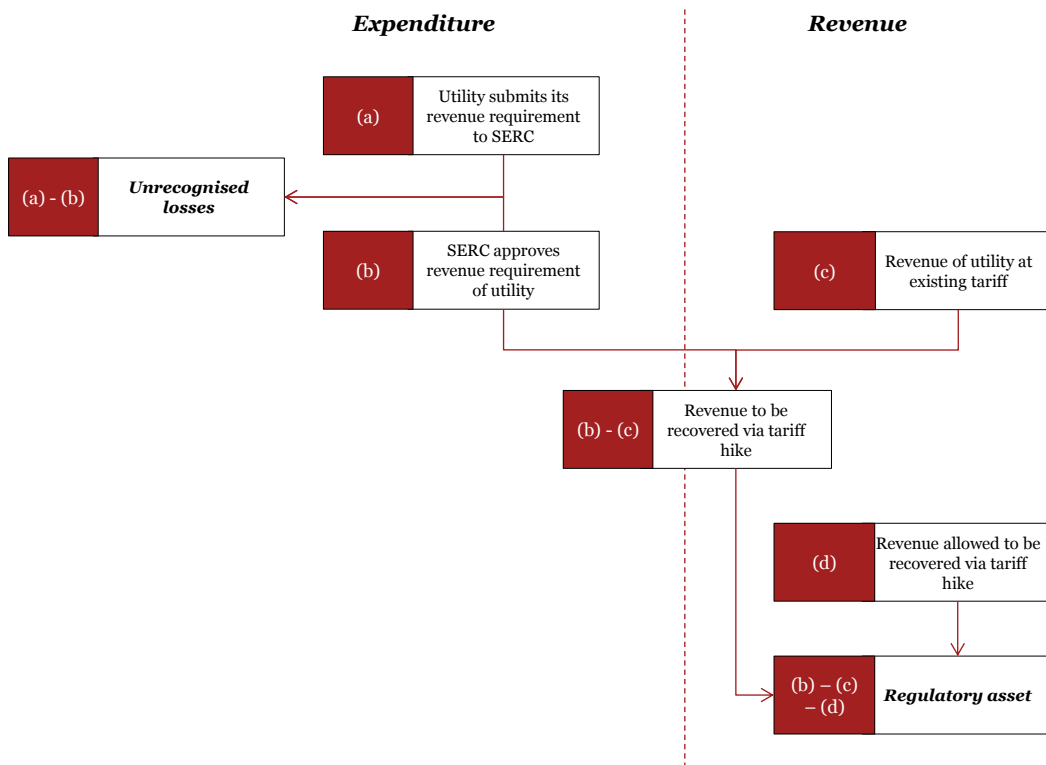
Retail Supply business	<ul style="list-style-type: none"> • Demand Forecasting and business planning • Efficient power procurement • Trade power with other suppliers (to account for any power shortfalls or access power than requirement) • Bill generation and distribution • Revenue collection from consumers • Customer Care • Credit contracts • Fulfilling regulatory obligations 	<ul style="list-style-type: none"> • Consumer interface • To ensure contractual availability of power to its consumers • Commercial loss reduction
Intermediary Company	<ul style="list-style-type: none"> • Procurement of power as per existing PPAs • Allocation of existing PPAs • Managing of existing cross subsidies • Handling regulatory assets (recognised accumulated financial losses) 	<ul style="list-style-type: none"> • Demand aggregation of multiple Retail Supply companies to enable efficient power procurement • Handling of unrecognised financial losses
Metering Company (by Distribution, Retail Supply or 3 rd party)	<ul style="list-style-type: none"> • Installation and maintenance of meters • Testing of meters • Replacement of meters 	<ul style="list-style-type: none"> • Meter reading

With such a demarcation of roles and responsibilities, all technical aspects of providing supply to consumers would be handled by the distribution business. The retail supply business would be responsible for the commercial aspects of the business like procurement of power and customer-interface post delivery of electricity.

Also, as per this division of roles, any technical issue beyond the consumer meter (e.g. internal wiring/tripping) would be the responsibility of the retail consumer and any technical faults that are not related to the distribution network or consumer meter would have to be repaired by consumer on his own.

3. Treatment of existing financial losses

As per the PFC report on Performance of state power utilities for the years 2010-11 to 2012-13, the aggregate book losses (on accrual basis) for all the utilities selling electricity directly to consumers stood at Rs. 69,108 crores in the year 2012-13. These book losses can be further classified into recognised regulatory assets and other unrecognised losses. Regulatory assets are the revenue gap of utilities which are recognised by the state electricity regulatory commissions but which could not be passed onto consumers in the form of a tariff hike and are therefore to be amortised in due course of time. Unrecognised financial losses are the revenue gap created because of dis-allowance of certain costs of the utilities by the regulatory commissions due to reasons like failure to meet performance targets by the utilities and imprudent expenditures.



The following approaches can be adopted to deal with existing financial losses –

- (i) **Regulatory Assets:** Regulatory Assets can be transferred to Intermediary Company and amortised through one of the following approaches –

☛ **Decision Point – amortisation of regulatory assets**

- a. **Collection of a Universal Charge** – A universal charge could be collected from all consumers to amortise the regulatory assets gradually.
- b. **Support from State Government** – State Governments could give a one-time financial relief for liquidating the regulatory assets or gradually amortising them.
- c. **Hybrid approach** – State Governments could fund a part of Regulatory Assets, the rest being collected through a Universal Charge. Alternatively, the State Government could fund the Universal Charge to be levied on economically weaker consumer categories like agricultural consumers or BPL consumers.

- (ii) **Un-recognised financial losses on balance sheet of Discoms:** Unrecognised financial losses on the balance sheet of existing Discoms are due to factors like costs disallowed by the regulators or failure to meet loss reduction performance targets. These unrecognised financial losses too would have to be cleaned from the balance sheets of Discoms before the introduction of retail supply competition in order to ensure the incumbent retail supply companies remain competitive in an open market. Following approaches can be adopted for the treatment of these losses –

☛ **Decision Point – amortisation of unrecognised financial losses**

- a. **Asking incumbent Distribution and Supply companies to take a financial hit:** since the unrecognised financial losses could be on account of operational inefficiencies of discoms, that were not allowed by the appropriate commissions to be passed on to consumers through tariff, the incumbent Distribution and Supply Companies could be asked to take a financial hit

on account of these losses. The factors for division of these losses between distribution and supply companies will need to be deliberated.

- b. Recovery of unrecognized financial losses to be allowed:** the unrecognised losses, or a part of them, could be allowed by the appropriate Commissions to be passed on to consumers. This can be done through financial Support from State Government.

The pros and cons of these approaches are as follows –

Approach	Pros	Cons
Regulatory Assets (RA)		
Collection of Universal Charge (UC)	<ul style="list-style-type: none"> • Transparent mechanism: UC could be shown as a separate item in the consumer bill 	<ul style="list-style-type: none"> • Additional financial burden on consumers: Since UC is non by-passable charge, it adds financial burden on even marginalised consumers
State Government support	<ul style="list-style-type: none"> • One time settlement: existing Regulatory Assets can be amortised as a one-time benefit by State Government 	<ul style="list-style-type: none"> • Additional burden on tax payers • Already high fiscal deficit of State Governments may not allow this additional burden • State Government may not be able to extend support to private utilities
Hybrid approach	<ul style="list-style-type: none"> • Government Support to select consumers: The UC obligations of select marginalised consumers like agricultural category could be funded by State Government 	<ul style="list-style-type: none"> • Additional burden on tax payers • Already high fiscal deficit of State Governments may not allow this additional burden • State Government may not be able to extend support to private utilities
Un-recognised financial losses on balance sheet of Discoms		
Incumbents take a hit	<ul style="list-style-type: none"> • Right signal to improve efficiencies in future: sends a signal in industry to improve efficiency 	<ul style="list-style-type: none"> • Allocation between companies: allocation between Distribution and Retail Supply company will be an issue • Incumbent Supplier may become uncompetitive: owing to heavy loss burden on its balance sheet, the Incumbent supplier may become uncompetitive against new suppliers with the commencement of reforms itself
Full or part recovery allowed	<ul style="list-style-type: none"> • Sector viability: would help utilities to raise funds in future and ensure sector viability 	<ul style="list-style-type: none"> • Deterrent for efficiency improvement: discoms who managed to reduce losses efficiently would be penalised indirectly as now other discoms will also be allowed to recover back their losses

4. Transfer of existing PPAs

As per Section 2(35B) of The Electricity (Amendment) Bill 2014, the Intermediary Company would succeed the existing PPAs of incumbent Discoms. These PPAs would then be allocated by the Intermediary Company among the retail supply companies. The possibility needs to be explored if certain PPAs or part of PPAs of current discoms could be shifted to wholesale market i.e. power from such PPAs could then be sold in the wholesale market. There are three approaches of transferring PPAs to the Intermediary Company:

- **Transfer all PPAs** of current Discom to Intermediary Company
- **Transfer select PPAs** of current Discoms to Intermediary Company (for instance certain expensive PPAs or PPAs of plants older than 12 years which have already repaid their loans can be dissolved i.e. their power is to be sold through wholesale market while the remaining PPAs to be transferred to Intermediary Company)
- **Transfer partial PPAs** of current Discoms to Intermediary Company (a certain percentage of power from all PPAs could be transferred to the Intermediary Company while the rest of the power to be sold in wholesale market)

Another issue that needs deliberation is that if a private discom has PPAs with its group companies, whether such PPAs would also be transferred to Intermediary Company or not. As per the discussions with FOR, it is envisaged that such PPAs would also be transferred to the Intermediary Company.

The pros and cons of dissolving certain PPAs/part of PPAs versus transferring all of them to Intermediary Company are as follows –

Approach	Pros	Cons
Transfer all PPAs to Intermediary Company	<ul style="list-style-type: none"> • Existing contracts between generators and discoms to continue with discoms being replaced by retail suppliers. Both parties get long term financial and power procurement certainty. 	<ul style="list-style-type: none"> • Hampers development of wholesale market due to lesser unavailability of un-tied power. • Expensive PPAs due to increased cost pass through could leave retail supply companies un-competitive.
Transfer certain PPAs to Intermediary Company	<ul style="list-style-type: none"> • Helps in development of wholesale market. • Select expensive PPAs or PPAs where loan has been repaid could be dissolved, allowing retail suppliers to better manage their costs. 	<ul style="list-style-type: none"> • A mechanism would have to be developed for selecting PPAs to be dissolved. The mechanism would have to be objective, transparent and acceptable to all stakeholders including lenders.
Transfer partial PPAs to Intermediary Company	<ul style="list-style-type: none"> • Easy to implement. Leaves no subjectivity in the hands of Intermediary Company to select PPAs to be dissolved. 	<ul style="list-style-type: none"> • This approach would not go well with financial institutions which use PPAs as securities against loan to generators. • Separate percentages would have to be devised for different types of generation plants with different age.

The parameters that could be considered while deciding on which PPAs to be dissolved can be –

- **Age of PPA** – PPAs of generations plants which have already repaid their loan could be considered for dissolution as the lenders would not have any conflict of interest.
- **Cost of PPA** – PPAs which are exceptionally expensive compared to the power available in the wholesale market or other PPAs could be considered for dissolution to promote efficiency.

The parameters that could be considered while deciding on the percentages of PPAs to be dissolved in case of partial PPA transfer to Intermediary Company can be –

- Type of generation plant
- Age of generation plant
- Source of fuel
- Cost of power

Once multiple supply licensees come into an area of supply, the PPAs transferred to Intermediary Company will have be allocated between them in a fair and appropriate manner, allowing supply companies to serve their consumer base. The Intermediary Company would take on this role by adopting one of the various approaches available to allocate PPAs (discussed separately in ‘Issues in implementation of retail supply competition’ section under the heading ‘Allocation of PPAs’).

5. *Defining framework for Consumer Interface*

There can be following types of consumer complaints/queries/requests -

- Related to supply or metering:** For e.g. new connection, incorrect billing complaint, tariff related query, duplicate billing request, meter not working complaint, last meter reading query, meter replacement request etc.
- Related to distribution network:** For e.g. Power outage complaint, voltage fluctuations complaint, outage time query, shifting of connection request etc.

Also there can be two types of consumers which can have above mentioned complaints/queries/requests –

- Retail Consumer**
- Open Access Consumer**

After the introduction of retail supply competition, a Consumer Interface would have to be designed for speedy redressal of each type of complaint/query/request and for all types of consumers. Following approaches for developing such a consumer interface can be adopted:

☛ **Decision Point – Consumer Interface**

- **Single Window interface by Retail Supply Company:** Supply Company could become single window for all types of consumer complaints/queries/requests.

Supply company would then resolve the consumer complaints/queries/requests regarding Distribution or metering by representing consumer to Distribution Company or Metering Company (if any) respectively.

- **Single Window interface by Distribution Company:** Distribution Company could become single window for all types of consumer complaints/queries/requests.

Distribution company would then resolve the consumer complaints/queries/requests regarding Supply or metering by representing consumer to Supply Company or Metering Company (if any) respectively.

- **Separate interface for distribution and supply/metering:** Consumer could be given the responsibility to identify whether to approach Distribution Company or Retail Supply Company or Metering Company (if any) for complaints/queries/requests. For e.g. a customer care number could be created for issues related to power cuts and a separate customer care for other issues. Under this approach, during a transition period, both distribution and supply companies could be given mandate to route calls properly to appropriate entity i.e. if a call comes to a wrong entity, they divert it to correct entity rather than making the customer go to and fro.

For each of the approaches discussed above, the table below describes pros & cons and the resolution process for each type of complaint/query/request. Further the approaches towards consumer interface are evaluated based on the following parameters -

- Ease of consumers
- Setting the accountability (between Retail Supply and Distribution businesses)
- Duplication of work
- Need for new customer care assets

Issue/Approach	Approach 1 – Single Interface by Retail Supplier	Approach 2 – Single Interface by Distribution	Approach 3 – Separate interface for Supply and Distribution
Features of approaches – Type of consumers			
Interface for retail consumer	Supply Company	Distribution Company	Supply Company
Interface for open access consumer	Supply Company	Distribution Company	Distribution Company
Features of approaches – Type of complaints/queries/requests			
Resolution of supply related issues	Supply Company would take care at its end	Distribution Company would redirect to supplier	Supply Company would take care at its end
Resolution of distribution related issues	Supply Company would redirect to Distribution Company	Distribution Company would take care at its end	Distribution Company would take care at its end
Parameters for evaluation of approaches			
Ease of consumers	✔ Single Interface would work well even in areas with lower consumer awareness.	✔ Single Interface would work well even in areas with lower consumer awareness.	✘ Multiple Interface would require consumer awareness campaigns.
Setting the accountability	✘ Could misguide consumer and shift responsibility for	✘ Could misguide consumer and shift responsibility for	✔ Supplier and Distributor both accountable for their

	complaint/query/request on distribution company.	complaint/query/request on supply company.	respective issues.
Duplication of work	<input checked="" type="checkbox"/> complaints/queries/requests related to distribution would have to be routed from supply companies without any value addition.	<input checked="" type="checkbox"/> complaints/queries/requests related to supply would have to be routed from distribution companies without any value addition.	<input checked="" type="checkbox"/> assuming the consumer is able to identify the right body to approach for complaint/ query/ request, a lot of duplication of efforts could be prevented.
Need for new customer care assets	<input checked="" type="checkbox"/> the existing customer care centres would be shifted to retail supply company.	<input checked="" type="checkbox"/> the existing customer care centres would be shifted to Distribution Company.	<input checked="" type="checkbox"/> in order to ensure availability of each type of customer care centre in each area, new assets would have to be developed.

Setting the accountability between retail supply and distribution businesses

One of the major disadvantages of Single Interface (approach 1 and approach 2) is setting the accountability between retail supply and distribution businesses. For instance there can be multiple reasons for power outage/load shedding like

- Transmission or Distribution issues – capacity constraints, line outage, fault in transformers, grid security etc.
- Supply issues – non clearance of past dues with distribution or transmission companies, balancing and settlement issues etc.

In such a scenario the consumer could be misguided by the business responsible for the single window interface, regarding the reasons for the power outage. This can be validated from independent agencies like SLDC. SERCs would have an important role in tackling this issue by acting as a strict market regulator and ensuring heavy penalties in case of non-adherence of standards. In order to carry out its duties in a changed industry scenario with multiple players, the SERCs would require capacity building in order to ensure effective implementation of Single Window interface.

Actions taken against licensees by Ofgem in United Kingdom

Electricity distribution companies in UK are required to abide by several performance standards related to maintaining supplies, repairing faults and responding to customer complaints. The adherence to these standards is monitored by Ofgem, the energy regulator of UK. These standards set specific times by which licensees must resolve or respond to customer queries/complaints/requests. Consumers can receive compensation if these targets are missed by the licensee. Ofgem reports on company performance in an annual quality of service report.

Should the Ofgem find that a licence breach or Competition Act infringement has occurred, it has the power to impose large financial penalties, of up to 10% per cent of turnover. For example,

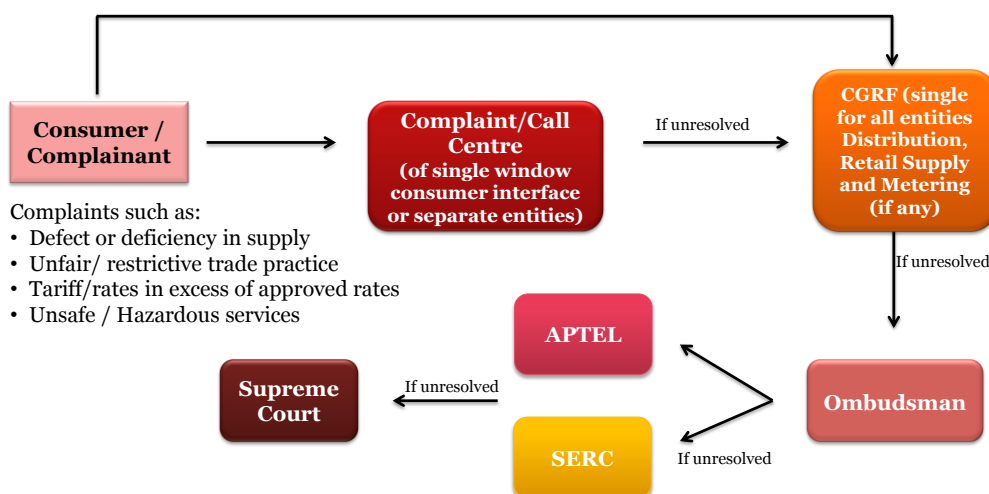
- In 2005 SP Manweb (part of Scottish Power) a distribution network operator was found to be discriminating in the provision of connection services against companies that weren't part of the Scottish Power group. Ofgem accepted a commitment from the company to end this practice.
- In August 2004, financial penalty of £700,000 was imposed on Powergen for the way it had objected to its customers switching to another supplier. Earlier that year Npower and Scottish Power had both been fined £200,000 each for the same behaviour.

6. Defining framework for Consumer Grievance Redressal Mechanism

The current framework of consumer grievance redressal mechanism consists of consumer first going to the internal complaint centre of utilities. In case the complaint remains unresolved at this stage or if the consumer is unsatisfied with the resolution, the consumer can go to the CGRF (consumer grievance redressal forum). The CGRF is governed by the Consumer Grievance Redressal Forum and Ombudsman regulation of the respective state. The CGRF is appointed by the utility on the directions of SERCs. There can be multiple CGRFs setup by utility, each having a sub-jurisdiction area within the jurisdiction area of utility. In case the consumer complaint is still unresolved at the CGRF stage, the consumer can then approach Ombudsman. Ombudsman is an independent body appointed by the SERCs. In case the consumer complaint is still not resolved the consumer can move to APTEL (Appellate Tribunal for Electricity) or the SERC for query resolution.

After the introduction of retail supply competition a two layered Consumer Redressal Mechanism could exist, as follows –

- A single CGRF for Distribution, Retail Supply and Metering (if any)
- Independent ombudsman



7. Segregation of standards of performance between entities

With the introduction of Retail Supply Competition, the issue may arise of how Standards of Performance (SOP) be allocated between the separate businesses of Distribution, Retail Supply, Intermediary Company and Metering Company (if any). The list of current SOPs would be allocated between successor companies based on the division of roles and responsibilities, which in turn would be become clear once approaches towards various issues are finalised. The below table shows an illustrative allocation of SOPs between various entities. The SOPs related to metering would be allocated to the entity which gets the responsibility of metering related activities.

SOP	Distribution	Supply	Intermediary	Metering (if any)
Operation of Call Centre		✓		
Restoration of Supply	✓			
Quality of Supply	✓	✓		
Meter Complaints				✓
Shifting of meter	✓			✓
Shifting of service lines	✓			
New Connection	✓	✓		
Additional Load	✓	✓		

SOP	Distribution	Supply	Intermediary	Metering (if any)
Transfer of Ownership		✓		
Change of Category		✓		
Temporary supply of Power		✓		
Consumer bill complaint		✓		
Disconnection of Supply	✓	✓		
Reconnection of Supply	✓	✓		

8. Universal Service Obligation on supply/network licenses

Electricity being an essential product, the Universal Service Obligation (USO) refers to the practice of providing a baseline level of services to every consumer. Once separation of distribution business and retail supply is achieved, the Universal Service Obligation can be split into two -

- i. 'The 'Duty to Connect' – This could be given to Distribution Company, it being the owner of network.
- ii. 'The 'Duty to Supply' – This could be given to the incumbent Retail Supply Company.

The USO obligations of new Retail Supply Companies other than the incumbent player has been discussed in the Stage 3 of the Roll Out Plan.

9. Tariff setting mechanism for new entities

SERCs will determine unbundled tariffs individually for Distribution Business, Retail Supply Business and Intermediary Company. The tariff setting mechanism for individual entities before stage 3 i.e. before retail supply competition is allowed, would be:

Tariff for Distribution Business: The SERCs would determine a regulated tariff, based on the filing made by Distribution Company. The tariff would allow for recovery of following costs –

- Network Capital Expenditure – depreciation, return on capital employed
- Operation and Maintenance Expenditure – employee expenses, administration and general expenses, repair and maintenance expenses, interest on working capital etc.
- Losses

Tariff for Retail Supply Business: The SERCs would determine a regulated tariff, based on the filing made by Supply Company. The tariff would allow for recovery of following costs –

- Capital assets – depreciation, return on capital employed
- Power Purchase cost
- Operation and Maintenance Expenditure – employee expenses, administration and general expenses, repair and maintenance expenses, interest on working capital etc.
- Losses

Intermediary Company: The SERCs would allow the following costs (passed onto consumers through Retail Supply Company) -

- Costs incurred towards PPAs (for instance financial loss due to inability to recover all power purchase cost for all PPAs)
- Operational Expenditure – employee expenses, administration and general expenses

While tariff would be calculated separately for the new entities, the collection responsibility would lie with Retail Supply Business. A mechanism will have to be developed for financial settlement between Distribution Business, Retail Supply Business and Intermediary Company.

10. Balance sheet segregation of current Distribution business among new entities

Assuming meter as the boundary of separation between the distribution and supply businesses, the balance sheet segregation can be done as described below.

Valuation/Allocation of assets

- i. The fixed assets can be allocated as follows –
 1. **Fixed Assets of metering and beyond** – the fixed assets of beyond metering like customer care centres would go to incumbent Retail Supply Company. The metering assets would go to the entity responsible for metering related services i.e. incumbent Retail Supply business, Distribution business or 3rd Party metering service (if any).
 2. **Fixed assets before metering** – these assets would be allocated to Distribution Company, it being the owner of network.
- ii. The allocation technique for current assets of discom would be:
 1. **Receivables** – receivables due from the retail consumers could be allocated to the Intermediary Company. These assets can be used by the Intermediary Company to service its liabilities. The Retail Supply Company would act as a collection agency of these receivables from retail consumers on behalf of Intermediary Company, and they could charge a commission for providing this collection service.
 2. **Consumer Security Deposits** – The consumer security deposits would be given to the Retail Supply Company based on the number and type of consumer under each of the companies.

While Section 47 of The Electricity (Amendment) Bill 2014 says that the Distribution Company may require a security deposit from consumers for providing connectivity, Section 51E states that the Retail Supply Company too may require a security deposit from consumers in order to provide electricity supply. Considering the financial settlement process between Distribution and Transmission Company in the current scenario, after the introduction of retail supply competition the retail supply company may be held responsible for payments to be made to distribution business i.e. the Distribution Company does not collect revenue directly from the consumer but from the Retail Supply Company. In case a consumer defaults, the responsibility to pay the distribution company would still lie on the retail supply company. Therefore the security deposit should also be with the Retail Supply Company only.

3. **Contractor's guarantees** – the guarantee amounts submitted by various contractors of current distribution company will be allocated between Distribution and Supply businesses based on the Fixed Assets allocated between them.

Valuation/Allocation of liabilities

- i. Based on the fixed assets allocation between individual businesses, the liabilities attached to them would be allocated to the Distribution and Supply companies respectively.
- ii. The allocation technique for current liabilities of discom would be:
 1. **Related to Power Purchase** – these will be transferred to Intermediary Company. The intermediary company would then further collect these from the incumbent Retail Supply

Company. A certain part of these could also be mitigated against the current asset receivables of retail supply companies, also transferred to the Intermediary Company.

2. **Related to contractor payments** - these will be allocated between the Distribution and Retail Supply companies based on the activities and asset allocation between the two.

🔍 **Decision Point – Valuation of Assets**

The valuation of assets can be done based on two approaches –

- a. Historical book value of assets – the value at which the assets are carried on the balance sheet
- b. Market value of assets – the price at which the utility can sell its assets

We believe that the valuation of assets should be an interactive process wherein the views of the investors from discussions should be considered during valuation process. The alternative methodologies would have to be assessed to arrive at a fair valuation of business/ assets. It is pertinent to mention that the valuation of the assets and business shall be in accordance with the revenue potential of the newly formed Distribution and Supply businesses.

The below table summarises the allocation criterions for various costs and assets in order to separate Distribution and Supply business as required in the first stage –

No.	Allocation of	Allocation based on	Allocated to
1.	Fixed Assets	Transfer Scheme	Distribution or Supply Company
2.	Long term liabilities	Fixed asset allocation	Distribution or Supply Company
4.	Current Assets - Receivables	Consumer base	Intermediary Company
5.	Current Assets – Security Deposits	Consumer base	Supply Company
6.	Current Assets – Contractors guarantees	Fixed asset allocation	Distribution or Supply Company
8.	Current Liabilities – Power Purchase	Existing PPA allocation	Intermediary Company
9.	Current Liabilities – Contractor payments	Fixed asset allocation	Distribution or Supply Company

11. Human Resource Planning

Apart from segregation of assets and liabilities, the human resource capital of the discoms would also have to be segregated between distribution business, retail supply business and metering function (if any). While significant capacity building would be required for these new entities in terms of human resource capital, the skill sets of the current employees would also have to be matched with the requirements of the new entities. The human resource planning would have to ensure that the new entities remain competitive against private players in future while having the capacity to service large number of regulated consumers as well. Following concerns regarding human resource planning will need to be deliberated while forming the transfer scheme of individual states:

- **Transfer Scheme of existing employees** – the employees of discoms will have to be allocated between the successor entities. This would require transferring staff with adequate skill sets to the successor entities for carrying out critical activities independently. The approach for developing this transfer scheme would include understanding the key staff requirements in restructured entities and identifying the services to be split between the entities. If any particular service cannot be split among

the entities, then the strategy to retain employees in one unit and providing services to other will have to be formed.

- **Going forward, finalization of organizational & human resource policies of the separate companies** – defining the Human Resource policies, post the implementation of transfer scheme. This may include:
 - Assessment of actual requirement of human resources for various successor companies
 - Suggesting ways for upgrading staff competencies
 - Implementing an appropriate communications strategy
 - Compliance with legal requirements and reduce disputes/litigations and addressing stakeholder concerns

12. Technical studies of as-is condition

In order to prepare the groundwork for next stage, the following studies will need to be carried out in this stage:

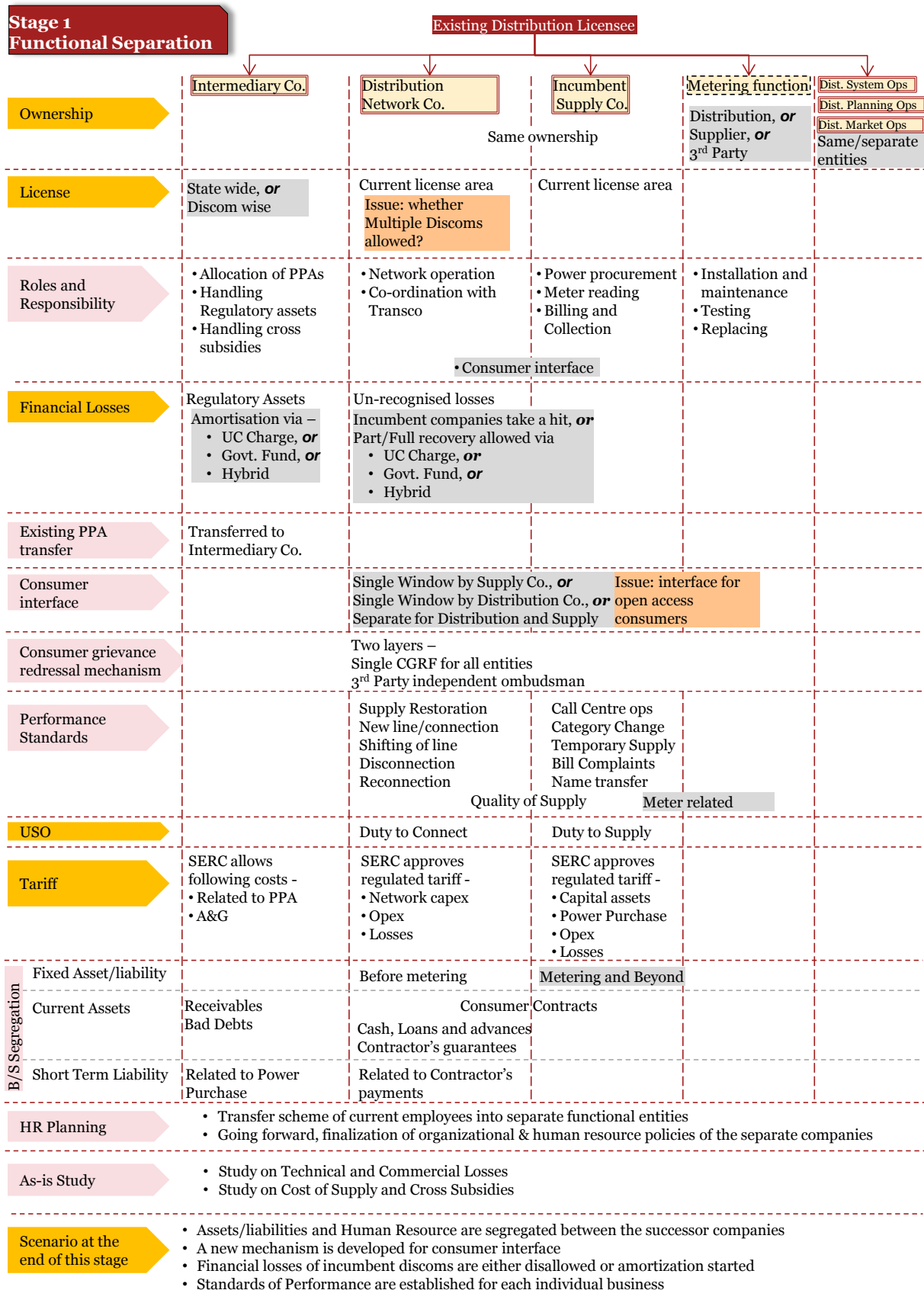
- **Study of Technical and Commercial losses** – current distribution companies will have to carry out technical studies including energy audit to accurately measure voltage wise and area wise technical and commercial losses.
- **Cost of Supply and Cross Subsidy Reduction study** – most of the State Commissions continue to use average cost of supply for the entire Discom to determine the tariffs. In order to make tariffs cost reflective, technical studies will have to be done by Discoms and SERCs to accurately calculate consumer category wise and area wise cost of supply. This would also help in measuring the existing level of cross subsidies. The discoms and SERCs would then have to chalk out a trajectory to reduce these cross subsidies in order to create a level playing field for all retail supply companies and remove entry barriers for new players.

Scenario at the end of stage

Implementation of the steps discussed above would result in following -

- Discoms would be segregated into distribution and retail supply businesses
- Assets/liabilities and Human Resource are segregated between the successor companies
- A new mechanism is developed for consumer interface
- Financial losses of incumbent Discoms are either disallowed or amortization started
- Standards of Performance are established for each individual business

Flow chart of Stage 1

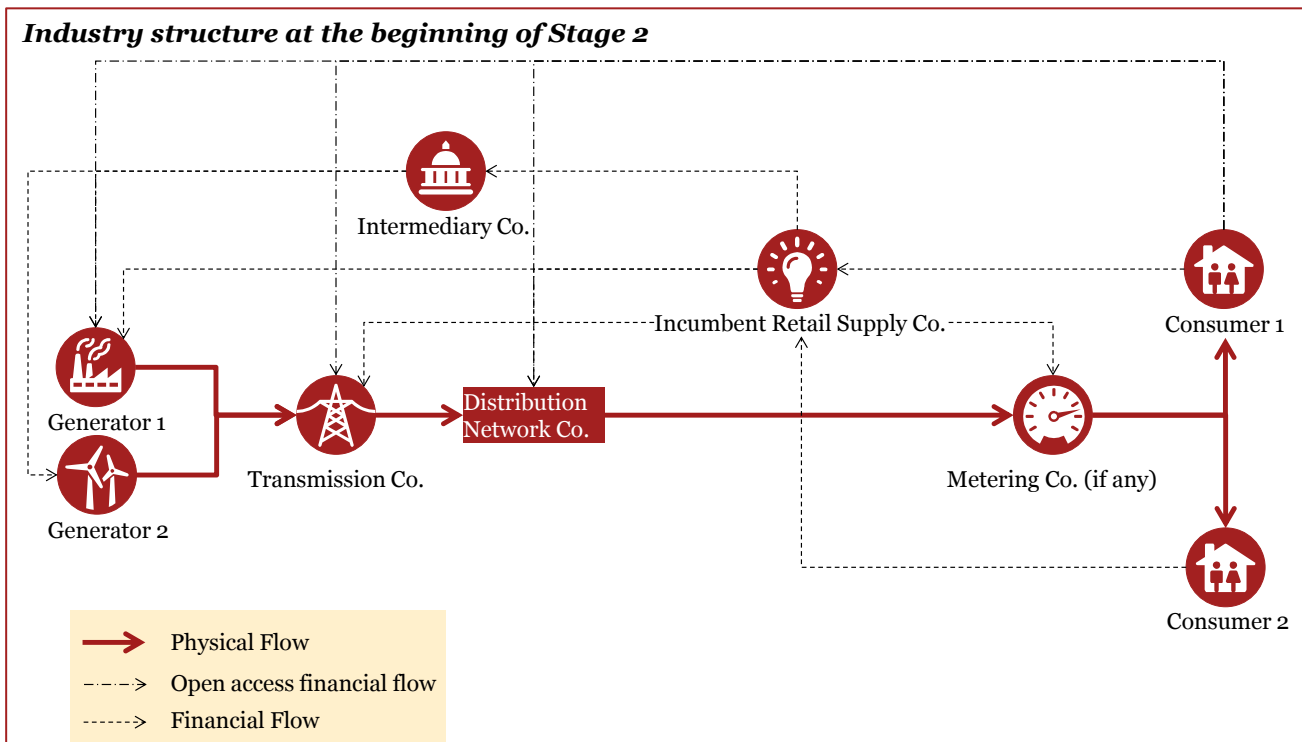


Stage 2: Preparation for competition

In the second stage of the roll out plan, before the second retail supply licensee is allowed to compete with the incumbent supply company, steps will have to be taken to create a level playing field. Also entry barriers will have to be removed in order to attract new players in the supply business.

Industry Structure at the beginning of Stage 2

Owing to the tasks performed in Stage 1, the platform is set for introduction of retail supply competition. At the beginning of this stage, the current Discoms would have been segregated into separate Distribution and Incumbent Retail Supply functions.



Key tasks required to be carried out in the stage

1. Ownership of network and retail supply company
2. Loss allocation across network and supply company
3. Reduction of cross subsidies
4. Up gradation of existing metering
5. Creation and ownership of Consumer Database

Description of the tasks along with various possible approaches for each of the task

1. *Ownership of network and retail supply company*

In the beginning of Stage 2, the Distribution and Retail Supply Company would have been segregated, but with the same ownership. In order to ensure that all retail supply companies (as and when new retail supply companies are allowed in the market) get neutral access to the distribution network and there is no complicity between the distribution company and the incumbent retail supply company, the matter arises whether the Retail Supply Company should be divested so as to have separate ownership or should it continue to be a State owned entity.

🗨 **Decision Point – Ownership of Retail Supply Company**

At the beginning of Stage 2 i.e. after the functional segregation of Distribution and Supply business, the Retail Supply Company could be:

- Divested to have separate ownership from Distribution Company – the state government could divest a majority share in the incumbent retail supply company while maintaining monopoly in the distribution company
- Continued as a State entity – the state government could continue to own the incumbent retail supply company but ensure the utility works as an independent autonomous body

Section 14 of The Electricity (Amendment) Bill 2014, states that while multiple supply licensees could be allowed in a license area, at least one of them should be a government controlled.

‘ ...Provided also that at least one of the supply licensee shall be a Government company or Government Controlled Company’

It needs to be ensured that while deciding on whether or not to divest the incumbent retail supply company, the provisions of Electricity Act (as and when passed by the parliament) are not violated.

2. *Technical and commercial loss allocation across network and supply company*

Aggregate Technical and Commercial Losses incurred by the existing distribution licensees can be classified as:

- **Technical:** These are losses due to energy dissipated in the conductors, equipment used for transmission line, transformer, sub transmission line and distribution line and magnetic losses in transformers.
- **Commercial:** These can further be divided into following parts:
 - Losses due to inaccurate metering. For eg. Defective metering, assessment based billing, unmetered connection and pilferage.
 - Losses due to theft
 - Losses due to hooking
 - Losses due to meter tampering/bypassing
 - Collection inefficiency losses – These are losses due to collection inefficiency of the bill generated

The responsibility of these losses would have to be allocated between the distribution business and the retail supply business.

Issue - The method of allocation of losses will also effect the approach towards other issues (like metering) as well. The possible approaches for this issue are discussed in detail in the later section regarding 'Issues in implementation of retail supply competition' under the heading 'Allocation of Technical and Commercial Losses between distribution and supply companies'.

3. *Reduction of cross subsidies*

Retail tariffs in India are fixed by SERCs keeping socio-economic considerations in mind and are hence pegged to capacity-to-pay rather than cost of supply. Traditionally the Domestic and Agricultural consumers are subsidised by Industrial and Commercial consumers. In case cross subsidies exist even after the introduction of retail supply competition, following concerns may arise -

- **Imbalance between cost and revenue streams of supply companies** - as and when the retail supply market is thrown open to competition, the first segment to avail the benefits of competition by changing the retail suppliers would be large consumers like Industrial or Commercial. If cross subsidies continue to exist in such a scenario, the incumbent supply company (which would continue supplying power to subsidised consumer categories) would suffer a loss, because significant cross subsidies would get eroded.
- **Cherry Picking of consumers** – Retail Supply Companies would want to supply only in those areas where the number of subsidizing consumers is more than subsidised consumers.

These are the following approaches to negate the effect of cross subsidies on retail supply competition –

☛ **Decision Point** – *approach for negating the effects of cross subsidies*

- (i) **Reduce Cross Subsidies through year on year tariff hikes**– This can be done through following a trajectory to increase cost coverage of tariffs, making tariffs reflective of their cost of supply.
- (ii) **Reduce Cross Subsidies using a Universal Charge (UC)** - The Universal Charge would be an identical charge imposed on per-unit basis on sales to all consumers of incumbent distribution companies. Collection of UC would go towards a state-wide/national fund to reduce the extent of cross subsidy in retail supply and any revenue gap created in doing so. The working of Universal Charge is explained with the help of a model in appendix 1.
- (iii) **Limiting subsidies to the wheeling charges** – Cross subsidies should be located in the wires component of the distribution tariff. Since wires are a monopolistic regulated industry and, therefore, are not subject to competition, market signals, though distorted, would not explicitly affect competition. This would ensure neutrality in level of cross subsidies across retail supply companies. This method is explained with the help of an illustration in the appendix 2.
- (iv) **Direct Subsidy from Government** – The State Government can fund the gap between tariffs and cost of supply for cross subsidised consumer categories like agricultural and domestic.

By using either of these approaches, the effect of cross subsidies will need to be negated before multiple retail supply companies are allowed in a license area. In case cross subsidies still remain before the introduction of retail supply competition, a mechanism will be developed for determination and collection of cross subsidy surcharge. This cross subsidy surcharge would have to be collected from retail supply companies as per the number of subsidizing consumers with each of them and redistributed among them in line with the number of subsidised consumers with each of the retail supply company. This mechanism of collection and distribution of Cross Subsidy Surcharge could be taken care by the Intermediary Company.

The pros and cons of these approaches for negating effect of cross subsidies are:

Approach	Pros	Cons
Reduce cross subsidies through year on year tariff hike	<ul style="list-style-type: none"> • Cost reflective tariffs: all consumer categories (as envisaged in Tariff Policy) would be paying tariffs as per their cost of supply. • Government can fund tariff hikes of marginalised consumers: State Govt. in order to prevent socio-economic consequences of tariff hikes could then fund partial tariff hikes of consumers like BPL⁷ or Agricultural. 	<ul style="list-style-type: none"> • Political will: increasing tariff for agricultural or domestic consumers could have socio-economic consequences. • Ability to Pay: steep tariff hikes could lead to consumer protests.
Reduce cross subsidies using a Universal Charge	<ul style="list-style-type: none"> • Transparent mechanism: this allows user to know the amount of benefit he/she is receiving/giving as cross subsidy. • Government can fund UC of marginalised consumers: State Govt. in order to prevent socio-economic consequences of tariff hikes could then fund UC obligations of consumers like BPL or Agricultural. 	<ul style="list-style-type: none"> • Complex mechanism: the calculation of UC by SERC, its collection by Supply Companies and allocation by Intermediary Company would entail a complex implementation mechanism. • UC would indirectly lead to tariff hikes: for consumers who do not get government support for their UC obligations would indirectly be affected by tariff hike.
Limit subsidies to the wheeling charges	<ul style="list-style-type: none"> • Level playing field for all retail supply companies – irrespective of which Retail Supply Company a consumer chooses the absolute amount of cross subsidy benefit would remain same. 	<ul style="list-style-type: none"> • The wheeling charges may not be enough to consummate the current high levels of cross subsidies.
Direct subsidy from Government	<ul style="list-style-type: none"> • Can be implemented immediately: this could be used as a temporary measure for creating a level playing field for all retail supply companies. • Transparent mechanism: this allows user to know the amount of benefit he/she is receiving/giving as cross subsidy. • Direct approach: this does not penalise other consumers for extending benefit of lower tariffs to some consumers. Instead the Government takes the burden for such support. 	<ul style="list-style-type: none"> • Additional financial burden on state: the financial burden on the state government would increase year on year as consumer sales increase or cost of supply increases.

⁷ Below Poverty Line: domestic consumer with monthly consumption below a threshold say 100 units. Also known as Kutir Jyoti consumer category in some states.

4. *Upgradation of existing metering*

In order to accurately calculate loss levels and to assist in balancing and settlement between multiple retail supply companies, the metering infrastructure till the distribution transformer will have to be upgraded by the distribution business.

The incumbent supply company would have to convert un-metered consumers to metered consumers. Further the existing meters of retail consumers would need to be gradually replaced by advanced meters, which are capable of recording consumption for every 15 min time slots to allow for -

- Accurate measurement of loss levels in each area of supply and voltage levels. This data would be required to determine allowed level of losses for retail supply companies in a given license area.
- Calculation of actual power purchased and sold by each retail supply company.
- Switching power off at consumer end, rather than at feeder level (switching power off at feeder level affects consumers of all retail supply companies).

5. *Creation and ownership of Consumer Database*

Going forward, a central database would need to be created with information regarding the consumer such as their billing address, meter number, usage pattern, bank account details etc. In order to develop this database, an activity similar to Know Your Customer (KYC) can be carried out for electricity consumers. Such a database would be useful in following cases –

- Companies before applying for Retail Supply license would need information about the consumer mix in the license area where they want to operate, in order to make an informed decision.
- Subsidies from Government could be transferred to consumer's bank account directly in future.

The issues that will arise regarding such a database are -

- **Data fields to be collected** – data related to following categories can be collected
 - Data related to consumer – address, meter details, consumer category etc.
 - Entities serving consumer – appointed distribution company, metering company (if any), retail supplier
 - Data related to energy usage – consumption pattern, connected load, load profile
- **Responsibility of ownership, collection and maintenance of database** – The data collection agency will collect data individually and then share this data with other entities. The data collection can be done through -
 - Retail Supply Company
 - Distribution Company
 - 3rd party metering company (if any)
- **Data privacy issues** – it needs to be deliberated whether database of consumers of specific license area be accessible to only retail supply companies and distribution companies of that area or anyone who wants to access it.

While deciding the ownership of the consumer database, it needs to be ensured that the consumer database has an independent and neutral access to all retail supply companies. Hence based on the discussions with FOR it is suggested that the consumer database be maintained by the Distribution Company. The retail suppliers would collect and share data with distribution business regarding the consumers under their respective jurisdiction.

The distribution company would share this database with commissions, intermediary company, retail supply companies and any other player as required.

Consumer database in United Kingdom

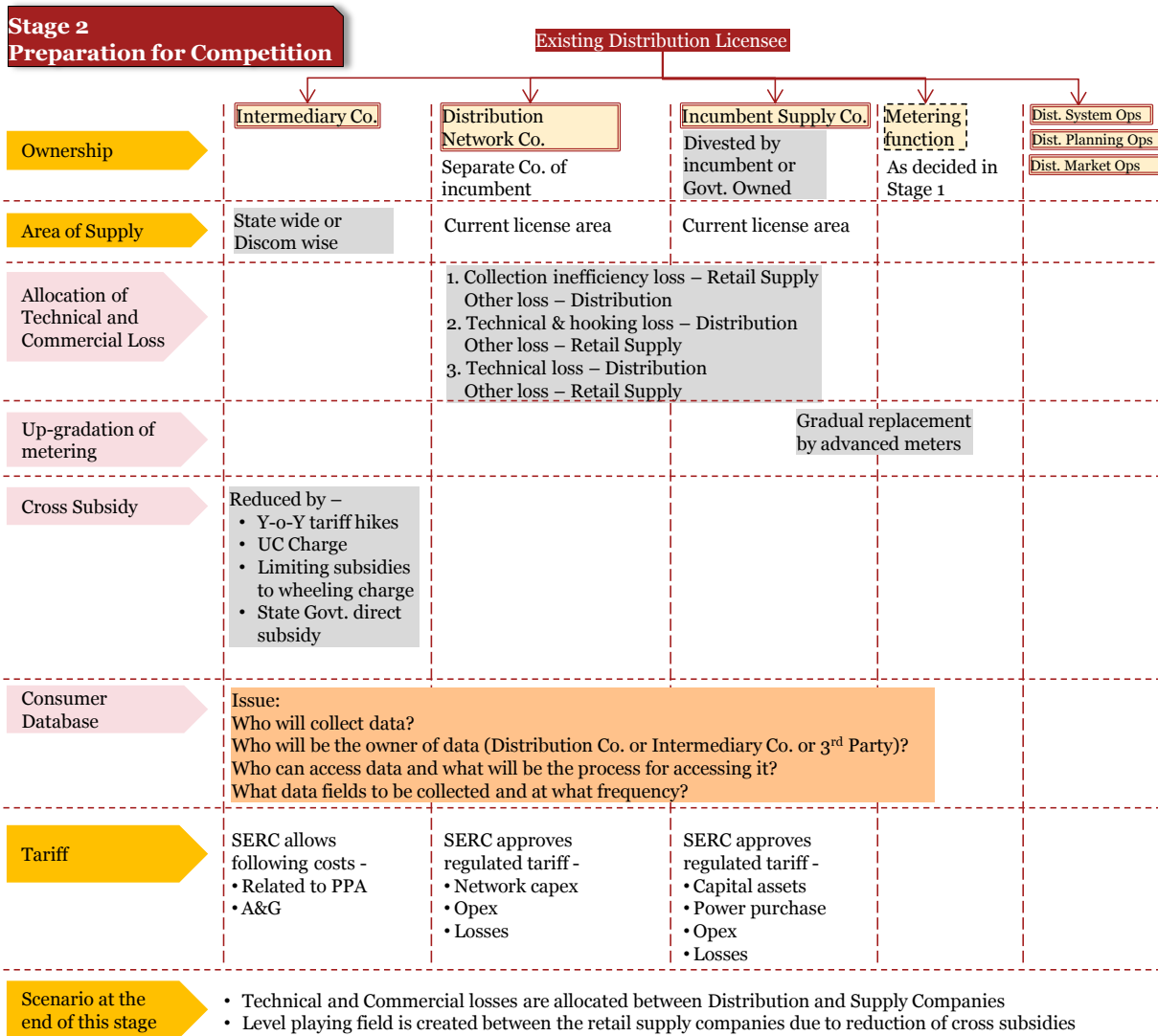
- Each regional electricity distributor in the UK (also known as the Distribution Network Operator, or DNO) operates the Meter Point Administration Service (or MPAS) for a specific area of the UK. The MPAS database, known as the Electricity Central Online Enquiry Service (or ECOES; previously known as MPAS Online), contains information about the supply of electricity to each address in the UK.
- One important piece of information found on the database is the supply number or Meter Point Administration Number (MPAN). The MPAN is a 21 digit number used to uniquely identify your electricity supply. This number is needed by electricity suppliers when you want to switch your supply.
- A supply receiving power from the network operator (DNO) has an Import MPAN, while generation and micro generation projects feeding back into the DNO network are given Export MPANs
- Electricity Central Online Enquiry Service (ECOES) is a website that allows users and authorised industry parties to search for supply details (past and present) using such things as the 13-digit MPAN bottom line number, the meter serial number or the postcode.
- The user can determine a wide range of data relating to the supply including the full address, meter details, the current energisation status and also the appointed parties (i.e. the supplier, distributor, MOP, DC and DA). The site is populated from information sent from the supplier regarding the metering system.

Scenario at the end of stage

By the virtue of steps taken in Stage 1 and Stage 2, major hurdles in the introduction of Retail Supply Competition would be done away with. Key pointers of sector scenario at the end of this stage are –

- Technical and Commercial losses are allocated between Distribution and Supply Companies
- Level playing field is created between the retail supply companies due to reduction of cross subsidies

Flow chart of Stage 2



Stage 3: Onset of competition

In this stage of the roll out plan for retail supply competition, second Retail Supply Company would be introduced in a particular area of supply which would compete with incumbent supply company. Steps will have to be taken in this stage to provide the new retail supply companies with appropriate mechanisms like power procurement, balancing and settlement and tariff determination, required to conduct their supply business in an efficient manner.

Industry Structure at the beginning of Stage 3

While the industry structure would remain same at the beginning of stage 3 as in the beginning of stage 2, owing to the tasks performed in Stage 2, the industry would have become conducive for the entry of second Retail Supply Company in a license area.

Key tasks required to be carried out in the stage

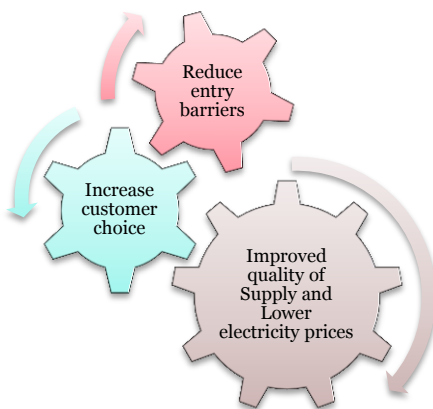
This Stage discusses tasks required to eliminate issues that may arise due to multiple retail supply companies in an area:

1. Defining license area and issuance of new supply license
2. Phasing of competition – identifying contestable consumer categories or connected load
3. Power procurement model – allocation by intermediary company
4. Consumer switching mechanism
5. Process for procurement of new PPAs
6. Balancing and settlement
7. Tariff setting mechanism for consumer open for competition
8. Defining framework for Provider of Last Resort
9. Extending USO to new retail supply companies

Description of the tasks along with various possible approaches for each of the task

1. Defining license area and issuance of new supply license

One of the objectives of introducing retail supply competition is to give choice to consumers. To support this objective, Section 14 of the Electricity (Amendment) Bill 2014 provides for multiple supply licensee in an area.



'Section 14Provided also that the Appropriate Commission may grant a licensee to two or more persons for supply of electricity within the same area of supply, progressively as may, subject to the conditions.....'

It is expected that multiple retail supply licensee in an area competing for market share would bring in operational efficiencies, improved quality of services and reduction in electricity costs for consumers. In this stage, after the entry barriers are removed for new retail supply companies due to tasks performed in Stage 1 and Stage 2, second (and further on) retail supply company would be allowed to enter market in order to compete with incumbent retail supply company.

Issue - The license area in which this new retail supply company would be allowed to operate is an issue for discussion. This issue is discussed in detail in the later section 'Issues in implementation of retail supply competition' under the heading 'Delimitation: Area of Supply and phasing of retail supply competition'.

2. Phasing of competition – identifying contestable consumer categories or connected load

In a particular supply license area, the retail competition can be introduced in phases, where in each phase, the new retail supply companies would be allowed to supply electricity to a certain section of consumers. For e.g. let's assume a new retail supply company is given licensee to supply electricity in the license area of the incumbent Discom. During first year of its operation, the new retail supply company could be allowed to sell electricity to only consumers with connected load 1 MW and above, i.e. only the consumers with connected load of 1 MW and above get choice to select their retail supply company, the remaining being served by incumbent supplier. Gradually this threshold of 1 MW could then be lowered in phases to bring in more and more consumers under the purview of retail supply competition.

The benefits of gradual phasing of retail supply competition are:

- Phasing allows to carry out a pilot study by introducing competition in a smaller section of consumers
- New players may get time to ramp up their resources as consumers are gradually opened up for competition
- Gradual introduction of competition allows new players and consumers in the industry to acclimatise down to new regulations and industry structure

Issue – The method in which phasing would be done and the time-line in which it would be implemented, is discussed in detail in the later section 'Issues in implementation of retail supply competition' under the heading 'Delimitation: Area of Supply and phasing of retail supply competition'.

3. Power procurement model – allocation by intermediary company

The PPAs which are transferred to the Intermediary Company would need to be allocated amongst retail supply companies. This task is important to both Intermediary Company and retail supply companies as:

- Power purchase cost forms a major part of retail tariffs (80 – 90% in most of the cases). Any saving in the power purchase cost can give advantage to one retail supply company over other.
- Existing Discoms have large number of long term PPAs with varying periods and costs which would be transferred to Intermediary Company. In order to meet financial obligations of these PPAs, the Intermediary Company would have to allocate them to retail supply companies i.e. PPAs transferred to the Intermediary Company would have to be disposed of against demand of retail supply companies.

A retail supply companies could procure power through -

- Long term PPAs
 - With Cost Plus tariff – of upto 25 years time period
 - With tariffs discovered through competitive bidding – of 12 years or above time period
- Medium term PPAs – of more than 3 years time period
- Own generating stations
- Energy traders
- Energy exchange / Whole sale market

Currently most of the installed generation capacity is tied up under long term PPAs with existing Discom and power available through energy exchange / wholesale market is minimal. Therefore retail supply companies would have to rely largely on allocation of PPAs from Intermediary Company for meeting the power demand of their consumers.

Issue – since power purchase cost forms a major part of retail tariffs and because current disocms have large a quantum of long term PPAs, a fair and efficient mechanism would have to be developed to either allocate PPAs of current disocms to new retail supply companies or to allow them to enter into new PPAs. This issue is discussed in detail in the later section ‘Issues in implementation of retail supply competition’ under the heading ‘Allocation of PPAs’.

4. *Consumer switching mechanism*

After the introduction of multiple retail supply companies in a license area, the consumers would get the option to choose from among available retail suppliers. Shifting of consumers from one retail supplier to another would need deliberation on following changeover activities, during forming the individual roll out plan of states:

- **Recovery of stranded costs like past revenue gaps or regulatory assets from consumers:** While the treatment of accumulated recognised regulatory assets was discussed in the task ‘treatment of existing financial losses’ in stage 1, the SERCs may allow creation of new regulatory assets in the future. If consumers of such retail supply companies switch to another supplier, the retail supply company which has to amortise its regulatory assets would be left with a smaller consumer base to recover these assets. This could lead to tariff shock for the balance consumers of the retail supplier. To prevent this, the Intermediary Company may have to create a mechanism to ensure collection of these costs from concerned consumers irrespective of the retail supplier they are taking electricity from.
- **Recovery of dues from consumer:** If a consumers switches to another supplier without clearing its past dues with its existing retail supply company, the recovery of these dues becomes an issue. In case the security deposit of the consumer is insufficient to cover these dues the retail supplier may have to take a financial hit on account of payments already made to distribution and generators for supplying electricity to such consumers. Also it is possible that current Retail Supply Company would have disconnected certain consumers due to non-payment of dues. It needs to be deliberated whether such consumers would be allowed to take a new connection from another retail supply company or not, before the resolution of its disputes with current retail supply company. To resolve these issues, a robust communication mechanism will have to be developed by the retail supply companies among themselves to ensure such consumers are not allowed to switch retail suppliers without clearing there past dues.
- **Defining consumer category at the time of switching:** it needs to be deliberated whether a consumer would be allowed to change consumer category while switching its retail supplier or will the consumer be allowed to switch in the same consumer category only.
- **Security Deposits:** at the time of consumer switching, the new retail supply company taking over the consumer would have to inform consumer of the security deposit requirements. It needs to be deliberated whether the existing security deposit of consumer with the current retail supply company would be refunded to the consumer or settled with the new retail supply company.
- **Frequency of consumer switching:** it needs to be deliberated that when will the consumers be allowed to switch from one retail supplier to another. High switching rates of consumers could create difficulties for retail supply companies in managing their power procurement and demand forecasting.

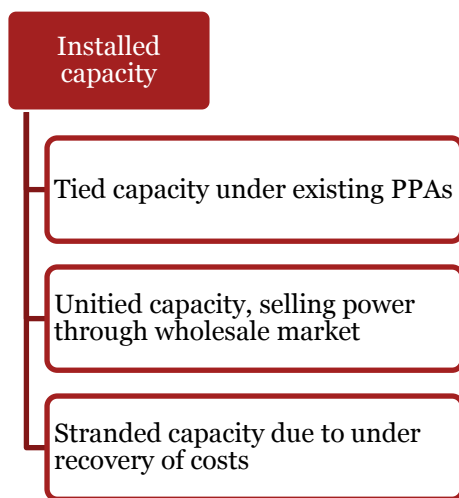
🔍 **Decision Point** – *allowed frequency of consumer switching*

The consumer could be allowed to switch retail supply company on –

- On certain dates
- Anytime during the year
- After the expiry of a lock-in period with current retail supplier

5. *Process for procurement of new PPAs*

One of the pre-requisites of introduction of Retail Supply Competition could be setting up of an efficient Wholesale Electricity market. However considering the nascent stages of development of such a market, the Retail Supply companies will have to rely on PPA route in the near future to procure power for long term.



Considering majority of the existing generation capacity would be tied up in long term PPAs with current discoms, the new retail supply companies would have to explore the option of entering into new PPAs with the stranded generation capacity. Close to ~52 GW bid capacity out of ~76 GW of coal based power projects awarded through competitive bidding under Section 63 of Electricity Act 2003 between 2006 and 2014 are facing viability challenges and are stranded. The new retail supply companies would have opportunity to bargain preferable terms with such generators and form medium to long term PPAs with them.

In future as smaller new retail supply companies come into the market, their individual bargaining power with the generators could decrease. This situation can be avoided by ensuring that in

generation sector also there are no dominant players which can arm twist the retail suppliers.

In a scenario where dominant generating companies are not broken down, the Intermediary Company could provide a service to smaller retail supply companies of aggregating their energy demands and entering into PPAs with generators.

🔍 **Decision Point** – *procurement of new PPAs*

The Retail Supply Companies can enter into new PPA through following approaches –

- Individual Contracts with generators:** each Retail Supply Company could enter into PPA with generators individually.
- Demand Aggregation:** The Intermediary Company can act as a demand aggregator for smaller Retail Supply Companies and enter into PPAs with generators on their behalf. This role of Intermediary Company will have to be defined in the roles and responsibilities of Intermediary Company.

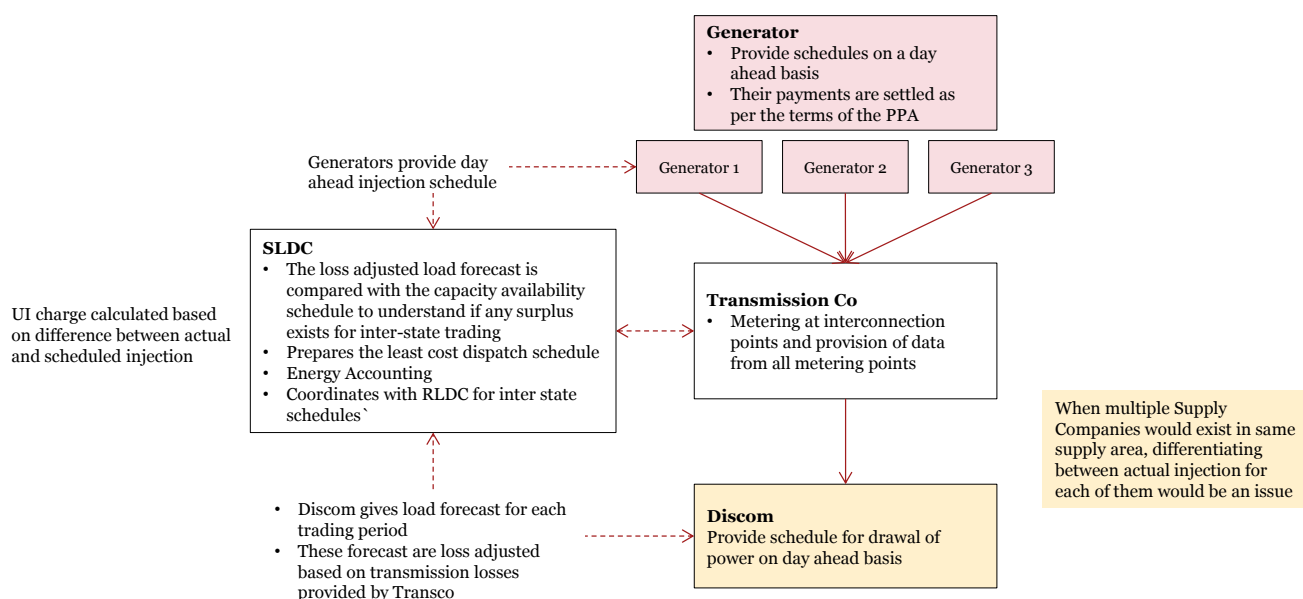
In case Retail Supply Companies are not allowed to enter into PPAs after the expiry of their existing PPAs, and they are asked to procure power through Wholesale Electricity Markets, the following issues will arise -

- It needs to be deliberated on how to compare electricity from different power generating stations on a common platform of wholesale electricity market to avoid undue advantage to certain generators. For e.g. Hydro plants in their later stages of life will have lower generation costs than their competitors.

- Generators in India have to show PPAs in order to secure financing for their projects. Therefore in future with a fully functional wholesale market, it needs to be deliberated on how banks will change their lending covenants.

6. Balancing and settlement

The energy balancing and settlement allows parties (generators and Discoms) to make submissions to SLDCs to either buy or sell electricity into/out of the market at close to real time in order to keep the system from moving too far out of phase. SLDCs monitor the actual positions of generators and suppliers, based on the metering data provided by Transmission Company, against their contracted positions and settling imbalances when actual delivery or offtake does not match contractual positions. Unscheduled Interchange charges are then calculated based on these imbalances between actual delivery/offtake and contractual positions.



After the introduction of retail supply competition, the Unscheduled Interchange charges would have to be calculated separately for each retail supply company in a license area. This is required in order to encourage retail suppliers to do better load forecasting, refrain from over/under drawal from the grid and ensure overall grid security. However to calculate the deviation of each retail supply company from its scheduled power drawal, actual power used/consumed by each individual retail supply company will need to be calculated. Since the current metering is done at interface between transmission and distribution for Unscheduled Interchange (UI) settlement, wherein multiple retail supply companies could exist after the introduction of retail supply competition, calculation of this actual power used/consumed by each individual retail supply company at any given point of time would be an issue.

Decision Point – Balancing and Settlement

There can be two approaches possible for the mechanism of balancing and settlement after the introduction of retail supply competition –

- Making Advanced Metering compulsory for new Retail Supply Companies** - Each new Retail Supply Company entering in the market would be asked to install Advance Metering systems for new consumers that they acquire. This way the total power sale for this new Retail Supply Company can be metered on actual basis. With adding normative losses on the consumer sales, energy consumed by new retail supply companies can be arrived at. The energy consumed by incumbent retail supply

company can be calculated by reducing the figures of new retail supply companies from the total energy consumed at distribution and transmission interface.

- **Based on consumer category wise sample load curve** – under this approach, consumer category wise sample load curve is prepared based on the historical data. This load curve may vary for location and season. Based on the energy consumed by consumers of a category for a retail supply licensee, the load curve for that consumer category of the retail supply company is prepared. By adding the load curves of all consumers categories of the retail supply company, aggregate load curve of the retail supply company is prepared. This load curve is then used for balancing and settlement. The process of preparing the load curve would gradually improve as more data would be available regarding the energy consumption patterns of consumers. Also updation in load curves would be required as consumer behaviours change with time and seasons.

The pros and cons of these approaches are:

Approach	Pros	Cons
Making Advanced Metering compulsory for new retail supply companies	<ul style="list-style-type: none"> • Would ensure gradual replacement of existing metering by Advanced Metering. • Actual values of power consumption for each retail supply company can be calculated. 	<ul style="list-style-type: none"> • High cost of Advanced Meters could become entry barrier for new retail supply companies.
Based on consumer category wise sample load curve	<ul style="list-style-type: none"> • No need of expensive Advanced Meters in initial stages. 	<ul style="list-style-type: none"> • Would not give actual values of power consumption of retail supply companies.

Settlement of Renewable Energy

In future as the usage of renewable energy increases, retail consumers could start producing energy locally at their premises to meet their electricity requirements, through sources like wind or solar. In such a scenario, while initially the electricity generated through such renewable sources would complement the electricity supply from retail supply companies, later on as the generation from renewable sources increase or the consumption pattern of consumers change, the retail consumers could begin to inject electricity into the grid. To deal with such scenarios, bi-directional meters (import export meters) would have to be installed at consumer premises in order to measure both electricity withdrawn by the consumer from the grid and electricity injected by the consumer to the grid. Also a mechanism would have to be developed to take this electricity into consideration while doing balancing and settlement.

7. *Tariff setting mechanism for consumer open for competition*

After the introduction of new retail supply companies, the SERCs would have to determine tariffs separately for distribution company, incumbent retail supply company and the new retail supply companies. The tariff determination process for Distribution Company would remain same as in stage 1 of the roll out plan i.e. the SERCs would approve a regulated tariff. Since Incumbent Retail Supply Company would be allowed to sell power to both consumers open to competition and consumers not open to competition, separate accounts would have to be maintained by them for cost allocation between these two types of consumers. The SERCs would determine a ceiling tariff for contestable consumers and a regulated tariff for consumers not open for competition. The Incumbent Retail Supply Company would need the financial data of costs involved in supplying electricity to non-contestable consumers (consumers not open for competition) separately for tariff

fillings to SERCs to determine regulated tariff. For the new Retail Supply Companies the SERCs would have to determine a ceiling tariffs for consumers open to retail supply competition. The new retail supply companies could then devise tariff plans of their choice within these ceiling tariffs.

	Consumers open to competition	Consumer not open to competition	Open Access consumers
Distribution business	Regulated tariff	Regulated tariff	Wheeling tariff - Regulated Tariff
Incumbent retail supply company	Ceiling tariff	Regulated tariff	Cross Subsidy Surcharge – Regulated Tariff
New retail supply company	Ceiling tariff	N/A	N/A

The ceiling tariff determined by SERCs for consumer open to competition would be used to create a Standard Tariff Plan, which all Retail Supply Companies would have to offer to their consumers mandatorily.

While currently the Discoms maintain separate accounting units for open access consumers in order to calculate the wheeling charges for them, after the introduction of retail supply competition the treatment for calculation of regulated tariff for open access consumers would be same as that of other consumers.

Also it needs to be deliberated while forming the roll out plan of individual states, whether offering different tariffs to different consumers under same consumer category and in the same supply area, based on certain objective parameters approved by appropriate commission, will amount to discrimination or not. The objective parameters based on which differentiation in tariff could be done, can be:

- i.** Consumer’s load profile
- ii.** Consumer’s credit history
- iii.** Consumer’s consumption pattern. For e.g. the peak hours in which consumers draw electricity
- iv.** Marginal cost of power
- v.** Or any other factor determined by the Commission

8. *Defining framework for Provider of Last Resort*

When multiple Retail Supply Companies would exist simultaneously in a license area, a retail consumer may not get electricity in following scenarios –

- Retail Supply Company is unable to supply electricity to a consumer because of unavailability of power with the Retail Supply Company
- Retail Supply Company is unable to continue its business and therefore cannot service its obligation towards its consumers

In such cases a designated ‘Provider of Last Resort (POLR)’ would have to supply electricity to such marooned consumers. The following issues will need deliberation regarding the POLR -

- i. **Tariff determination:** The tariff at which the POLR would supply electricity to consumer can have various approaches.

● **Decision Point – tariff for POLR**

The following approaches may be adopted for compensating the POLR -

- a. **Tariff of failed retail supply company** - the tariff at which the previous retail supply company was providing electricity to consumer (in order to honour the contract between consumer and the failed retail supply company)
- b. **Competitive tariff** - as charged by the respective supplier
- c. **Ceiling tariff** – the retail supply companies can decide their tariff subject to a ceiling decided by the Appropriate Commission
- d. **Actual cost pass through** – In case the POLR is allowed to pass on the actual cost incurred, the method for the State Commission to monitor these costs will be an issue of deliberation.

- ii. **Penalty:** the penalty and security mechanism in case Retail Supply Company or Distribution Company does not fulfil its obligation, will need to be decided.

- iii. **Implementation and Monitoring:** Mechanism will have to be developed for monitoring by Appropriate Commissions, of Retail Supply Companies and Distribution Company.

The pros and cons of these approaches are as follows –

Approach	Pros	Cons
Regarding tariff determination for POLR		
Tariff of failed retail supply company	<ul style="list-style-type: none"> • The consumers would be at benefit here as they might get to continue enjoying same tariffs as before 	<ul style="list-style-type: none"> • The State Government or Intermediary Company might have to fund the difference between actual cost of supply
Competitive tariff (this tariff would be lower or equal to the regulated ceiling tariff)	<ul style="list-style-type: none"> • POLR would not differentiate between regular consumers and consumers who came through POLR route 	<ul style="list-style-type: none"> • Consumers could be exploited with higher tariffs
Ceiling tariff	<ul style="list-style-type: none"> • Consumers would be protected against high tariffs from POLR 	<ul style="list-style-type: none"> • The State Government or Intermediary Company might have to fund the difference between actual cost of supply
Actual cost pass through	<ul style="list-style-type: none"> • No financial burden on POLR 	<ul style="list-style-type: none"> • The POLR might load more than fair share of costs on such consumers

9. *USO extends to new retail supply companies*

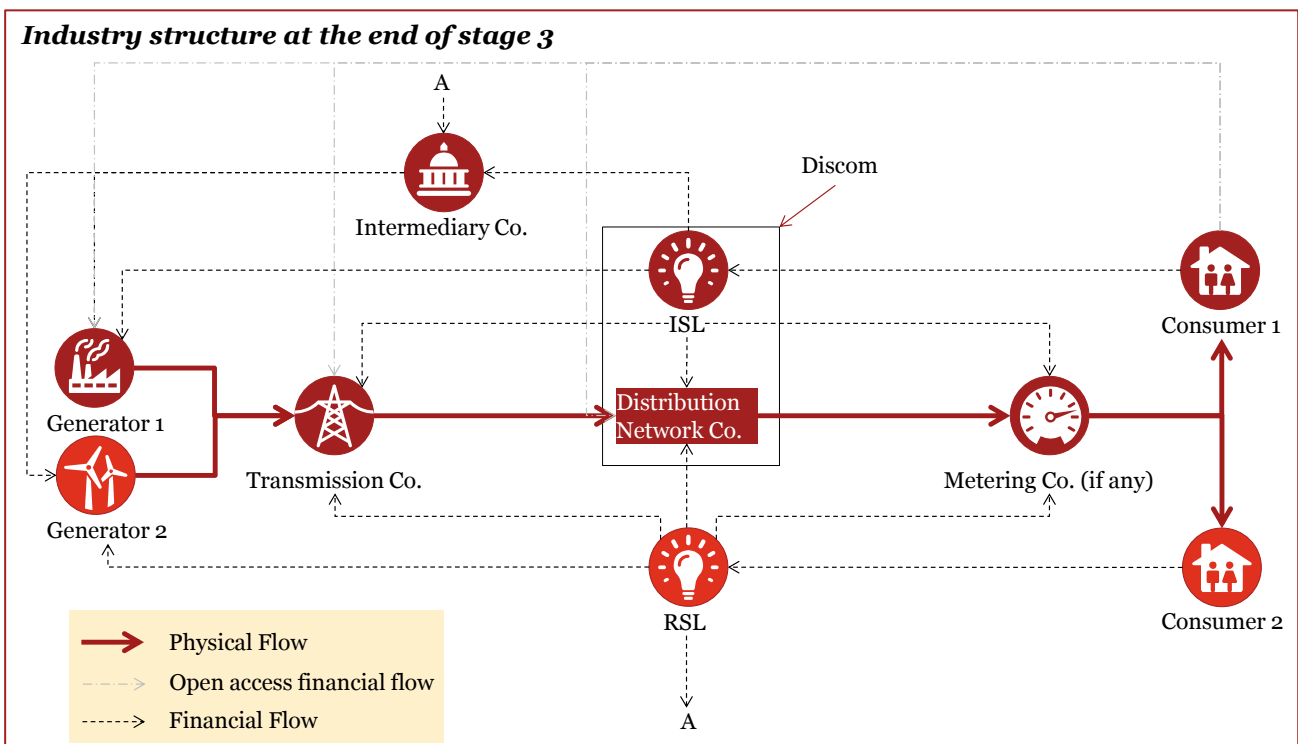
In stage 1 we had defined that under Universal Service Obligation (USO) the duty to connect would be of Distribution Company and Duty to Supply would be of incumbent Retail Supply Company. After the introduction of second Retail Supply Company in an area of supply, while the duty to connect would still remain

the responsibility of Distribution Company, whether duty to supply would be applicable on new Retail Supply Companies or not needs to be deliberated.

Issue – the various options of applicability/non applicability of USO on all new retail supply companies is discussed in detail in the section ‘Issues in implementation of retail supply competition’ under heading ‘Universal Service Obligation (USO)’.

Scenario at the end of stage

This stage would continue till all the consumers are not open for retail supply competition and a well-functioning retail supply market is created. After the end of this stage multiple retail supply companies would exist simultaneously offering various tariffs plans to the consumers, fostering healthy competition. Consumers would be able to choose the retail supply company which best suits their needs. Due to introduction of this competition, improvement could be seen in loss levels, metering and power procurement efficiency. The industry structure at the end of this stage would look like the proposed industry structure, as shown in the section ‘Background to Competition in India under the heading ‘Competition in Indian Power Sector’.



Flow chart of Stage 3

Stage 3 Onset of Competition						
	Intermediary Co.	Distribution Co.	Incumbent Supply Co.	Retail Supply Co.	Metering function	Dist. System Ops Dist. Planning Ops Dist. Market Ops
Ownership		Separate Co. of incumbent	Divested by incumbent or Govt. Owned	New entity	As decided in Stage 1	
Area of Supply	State wide or Discom wise	Current license area	Current license area	Current area, or Break up of areas		
Phasing			Factors • Inc/dec load, or • Inc/dec sales, or • Area of supply, or • Consumer category Timelines • Nation wide, or • State wise, or • Licence wise			
Allocation and pricing of existing PPA	Allocation of – • Actual PPAs, or • Power (MW) Method - • Fixed allocation • Dynamic allocation Pricing • Uniform • Actual cost • Differential Bulk Supply Tariff					
Consumer switch Mechanism			Allowed on – • Certain dates, or • Anytime, or • After expiry of a lock-in period			
Procurement of new PPAs	Demand aggregation		Individual contracts with generators			
Balancing and settlement	Sales of new supply co. (with AMR) reduced from DT level reading, or Based on consumer category wise sample load curve					
Tariff	SERC allows following costs - • Related to PPA • A&G	SERC approves regulated tariff - • Network capex • Opex • Losses	SERC approves regulated tariff - • Capital assets • Power purchase • Opex • Losses Issue: whether differential tariff allowed within consumer category basis certain factors, or not allowed	SERC sets Ceiling tariff applicable on all Supply Co. for consumers open for competition		
POLR			With incumbent Tariff for POLR – • Tariff of failed Supply Co, or • Regulated, or • Competitive, or • Ceiling, or • Actual Cost			
USO			USO for all	USO only for consumer open for competition		

Issues in implementation of retail supply competition

As discussed in the previous section, while implementing various tasks of the roll out plan, there are several issues that may arise and that need to be taken care of. In this section we discuss each of them and identify various approaches that can be adopted to deal with them, along with the pros and cons of each approach. Most of the issues discussed in this section are interdependent on each other i.e. the resolution of an issue is dependent on resolution of another issue. Every approach of each issue is given a unique code. This code is used to show the interdependence of various issues. The code is defined as follows –

Sample Code – D1A, stands for

D – Discussion Point

1 – Issue number 1 (1,2,3....so on)

A – Approach number of the issue (A, B, C....so on)

Issue 1 – Functional Separation of current Discom

During Stage 1 we functionally separate the current Discoms into a Distribution Business, a Retail Supply Business, an intermediary company and probably a 3rd party metering service company (in case metering is made a separate licensed activity). The Distribution business itself could be further broken down into following functions:

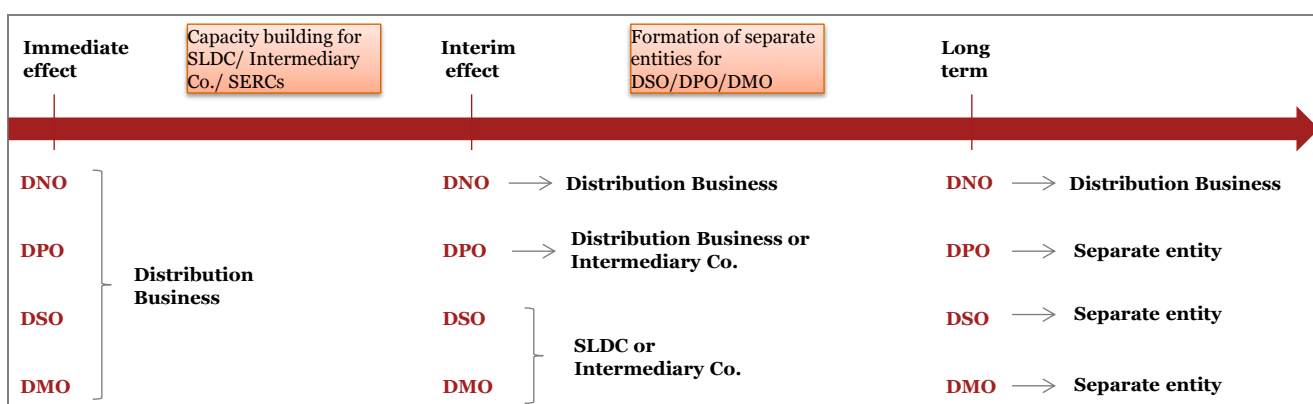
- a. Distribution Network Operations (DNO):** this function covers operation of the network. Also in case the responsibility of other metering related activities⁸ is given to the distribution business, the DNO would be the entity in charge of Meter installation/replacement, ownership of metering assets, meter operations and testing.
- b. Distribution Planning Operations (DPO):** this function covers the planning of distribution network expansion, operating code and technical design of the network.
- c. Distribution System Operations (DSO):** this function covers supervision of the network to ensure integrated operation for achieving maximum economy and efficiency in the distribution network.
- d. Distribution Market Operations (DMO):** this function involves accounting for the energy handled by the distribution network.

These functions could either be given to separate entities or kept with the same entity. In case these functions are allocated to separate entities it would ensure no conflict of interest between various functions and focused operations/investments in each function. On the other hand allocating these functions to a single entity would facilitate ease of business and regulations by limiting the number of industry players. In the initial stages of retail supply competition, the functions of DNO and DPO could be given to a single entity while the functions of DSO and DMO could be given to a separate single entity.

⁸ Detailed discussed in section 'Issues in implementation of retail supply competition' under heading 'Issue 3 – Metering Services'

Function	Entity responsible
Distribution Planning Operation (DPO)	Distribution Business or Intermediary Company
Distribution Network Operation (DNO)	Distribution Business
Distribution System Operation (DSO)	Appropriate SLDC or Intermediary Company or a new entity
Distribution Market Operation (DMO)	

Since many of the current Discoms do not have SCADA (Supervisory Control and Data Acquisition System) installed, allocating the Distribution System Operation function (DSO) to the SLDC could be difficult. Therefore before the introduction of retail supply competition, capacity building exercise would have to be done for SLDCs along with installation of SCADA. In the meanwhile a transitional approach could be that all of the four functions of DNO, DPO, DSO and DMO are kept with a single entity the Distribution business.



Since each of these 4 functions regarding the Distribution would require completely different skill sets and technology, in the long run each of them should be a separate function operating independent of each other.

Issue 2 - Allocation of Technical and Commercial losses between distribution and supply companies

It is important to assess the current distribution loss levels based on the energy audit and technical studies and classify it in technical and commercial losses. These technical and commercial losses would have to be allocated between distribution and retail supply companies. A trajectory for performance improvement would then be given to these entities based on the losses allocated to them, allowing approved losses to be passed onto consumers in the form of tariff. However accurate estimation of these losses would be difficult in view of the fact that many states still have substantial unmetered consumers whose consumption (for the purpose of estimating total sales and hence total distribution losses) and low levels of reliable metering.

Following approaches can be adopted for allocation of technical and commercial losses between Distribution and Retail Supply functions –

Type of Loss	Allocation to -		
	Approach 1 (D2A)	Approach 2 (D2B)	Approach 3 (D2C)
Technical	Distribution	Distribution	Distribution
Commercial			
Theft by Hooking	Distribution	Distribution	Retail Supply
Inaccurate metering	Distribution	Retail Supply	Retail Supply
Theft by Meter tampering/bypassing	Distribution	Retail Supply	Retail Supply
Collection inefficiency loss	Retail Supply	Retail Supply	Retail Supply

🔍 **Discussion Point – allocation of technical and commercial losses**

- **(D2A) - Allocation of collection losses to Retail Supply Company and remaining losses to Distribution Company**

In this approach, only collection inefficiency loss is allocated to retail supply company while the remaining losses are allocated to the distribution company. Although the commercial losses should ideally come under the purview of retail supply business, since it is difficult to differentiate between losses due to hooking and losses due to meter/tampering or bypassing of meter, all of these losses are allocated to the Distribution company under this approach.

- **(D2B) - Allocation of technical loss and hooking loss to Distribution company and remaining losses to Retail Supply Company**

In this approach, the Technical Losses would be allocated to Distribution company as the network is owned by it. Commercial Loss due to Hooking would also be allocated to Distribution business as the hooking would be done on Distribution company's network line.

The Collection inefficiency losses would be allocated to Retail Supply Company as the roles and responsibility of Retail Supply Company consists of revenue collection from consumers. The losses due to inaccurate metering and meter tampering/bypassing would also be allocated to Retail Supply Business.

In this approach however, differentiating between hooking losses and meter tampering / bypassing losses (in order to allocate them separately between distribution and supply businesses) would require extensive investment in metering at several levels (even upto the level of electricity poles in order to calculate hooking losses), which makes it difficult to implement this approach.

- **(D2C) – Allocation of all commercial losses (collection inefficiency, meter tampering/bypassing and hooking losses) to Retail Supply Company and technical losses to Distribution Company**

In this approach, the Technical Losses would be allocated to Distribution company as the network is owned by it. The Collection inefficiency losses and meter tampering/bypassing losses would be allocated to Retail Supply Company as the roles and responsibility of Retail Supply Company consists of revenue collection from consumers. Also the losses due to hooking would be allocated to Retail Supply Company as their employees would be visiting the consumer premises for meter reading and therefore could be in a better position to identify and report cases of hooking. A mechanism would have to be developed to ensure that the cases of hooking reported by supply company are resolved by Distribution

Company in a timely and efficient manner. This mechanism could be enforced through stringent Standards of Performance on distribution business.

Another option that could arise is in case metering is made a licensed activity. In such a case the commercial losses (other than collection inefficiency) could be allocated to the metering company (done by either Retail Supply Company, Distribution Company or a 3rd Party).

🗨 **Discussion Point** – regarding area wise losses

Also regarding the area of supply, the following issues would need deliberation while forming the roll out plans for individual states –

- (D2D) whether the entire supply area of a distribution company would have same allowed levels of technical losses or area wise technical losses are calculated
- (D2E) Whether all Supply Licensee in a given supply area would have same commercial losses or area wise commercial losses are calculated

Issue 3 – Metering Services

Metering activity is an important cornerstone of the commercial side of the distribution sector. The metering service can be broken down into following activities -

- Meter reading:** going to consumer premises to record the meter reading or using data communication services (in case of meters supporting this feature) for collecting meter reading data.
- Other Meter related activities:** Meter installation/replacement, ownership of metering assets, meter operations and testing.

After the separation of current Discom into Distribution and Supply functions, which one of them gets the responsibility for which metering activity, becomes an issue. Each of these activities could either be done separately by Retail Supply Company, Distribution Company or a 3rd Party Metering Company⁹ or both of these activities can be taken care by either a single entity. Therefore based on the logical permutations and combinations, several possible approaches for metering are:

Approach/Activity	Meter Reading	Other Meter related
Approach 1 (D3A)	Retail Supply Company	3 rd Party
Approach 2 (D3B)	Retail Supply Company	Retail Supply Company
Approach 3 (D3C)	Distribution Company	Distribution Company
Approach 4 (D3D)	3 rd Party	3 rd Party
Approach 5 (D3E)	Retail Supply Company	Distribution Company

The approach to be adopted towards metering would depend on the **approach adopted towards loss allocation**. The various loss allocation approaches discussed are:

- D2A – Allocation of collection inefficiency losses to Retail Supply Company and remaining losses to Distribution Company.

⁹ Although The Electricity (Amendment) Bill 2014 does not mention Metering as a licensed activity, for the purpose of illustrating various possibilities, this report assumes that in case a 3rd party company is brought in the sector for the metering activities, it would be a licensed activity and regulated by appropriate state commissions.

- D2B – Allocation of technical loss and hooking loss to Distribution company and remaining losses to Retail Supply Company
- D2C – Allocation of all commercial losses (collection inefficiency, meter tampering/bypassing or hooking losses) to Retail Supply Company and technical losses to Distribution Company.

The possible approaches of metering combined with various loss allocation approaches are evaluated on following parameters:

- Prevent any Conflict of Interests
- Encourage capital investment in metering services
- Ease of Billing
- Minimise number of visits to consumer premises and minimise duplication of efforts
- Loss Reduction -
 - Prevent possibility to manipulate loss figures (inaccurate metering)
 - Incentive to reduce hooking losses
 - Incentive to reduce meter tampering/bypassing losses

Approach 1 (D3A) for metering

Allocation of metering related activities under this approach would be as follows -

- Meter reading – Retail Supply Company
- Other metering activities – 3rd Party Company

Under this approach, assuming metering is a licensed activity, the 3rd party company which is brought in for metering services could also be allocated the responsibility of commercial losses related to inaccurate metering or meter bypassing/tampering. A separate loss allocation approach is also evaluated wherein inaccurate metering and meter tampering/bypassing losses are allocated to the 3rd party company.

Loss allocation	Approach 1 (D2A)	Approach 2 (D2B)	Approach 3 (D2C)	Approach 4
Technical Loss	Distribution	Distribution	Distribution	Distribution
Hooking Loss	Distribution	Distribution	Retail Supply	3 rd party company
Inaccurate Metering	Distribution	Retail Supply	Retail Supply	3 rd party company
Meter tampering	Distribution	Retail Supply	Retail Supply	3 rd party company
Collection Loss	Retail Supply	Retail Supply	Retail Supply	Retail Supply

Factors affected by loss allocation

Possibility to manipulate losses	<input checked="" type="checkbox"/> In order to shift losses from collection to other losses (hooking or meter tampering/bypassing), the Supply Company would have to generate lesser billing from actual energy sold, which is unlikely	<input checked="" type="checkbox"/> Since both meter tampering/ bypassing and collection inefficiency losses are allocated to supply company, they would have no incentive to shift losses from collection inefficiency to meter	<input checked="" type="checkbox"/> Since all commercial losses are allocated to Supplier, it would make efforts to reduce them.	<input checked="" type="checkbox"/> In order to shift losses from collection to other losses (hooking or meter tampering/bypassing), the Supply Company would have to generate lesser billing from actual energy sold, which is unlikely
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Loss allocation	Approach 1 (D2A)	Approach 2 (D2B)	Approach 3 (D2C)	Approach 4
	because by doing so the supplier would be letting go of revenue.	tampering/ bypassing.		because by doing so the supplier would be letting go of revenue.
Hooking losses	<input checked="" type="checkbox"/> Supplier would have no incentive to report hooking cases.	<input checked="" type="checkbox"/> Supplier would have no incentive to report hooking cases.	<input checked="" type="checkbox"/> Since hooking losses are allocated to Supplier, it would have incentive to report such cases. Mechanism would be needed to enforce Distribution company to reduce them.	<input checked="" type="checkbox"/> Since hooking losses are allocated to 3 rd party metering company, 3 rd party company would have incentive to report such cases. Mechanism would be needed to enforce Distribution company to reduce them. However the retail supply company would have no incentive to report hooking cases.
Meter tampering / bypassing losses	<input checked="" type="checkbox"/> Supplier would have no incentive to report meter tampering/ bypassing cases.	<input checked="" type="checkbox"/> Supplier would have incentive to reduce the losses.	<input checked="" type="checkbox"/> Supplier would have incentive to reduce the losses.	<input checked="" type="checkbox"/> 3 rd party would have incentive to reduce the losses.
Factors other than losses				
Conflict of Interest	<input checked="" type="checkbox"/> As per section 55 of the Electricity (Amendment) Bill 2014, a licensee cannot supply electricity to a consumer without a metered connection. While the duty to install a meter would be applicable on 3 rd Party, Supplier would be at loss if the 3 rd party does not abide by its responsibilities.			
Capital investment	<input checked="" type="checkbox"/> 3 rd party can bring in capital and technology to do focus investments.			
Ease of billing	<input checked="" type="checkbox"/> Both meter reading and bill generation with same entity.			
Number of visits to consumer premises	<input checked="" type="checkbox"/> Separate visits required for meter reading and meter operations.			
Ease of consumer switching	<input checked="" type="checkbox"/> No change required in metering when a consumer switches supplier.			

Approach 2 (D3B) for metering

Allocation of metering related activities under this approach would be as follows -

- Meter reading – Retail Supply Company
- Other metering activities – Retail Supply Company

Loss allocation	Approach 1 (D2A)	Approach 2 (D2B)	Approach 3 (D2C)
Technical Loss	Distribution	Distribution	Distribution
Hooking Loss	Distribution	Distribution	Retail Supply
Inaccurate Metering	Distribution	Retail Supply	Retail Supply
Meter tampering	Distribution	Retail Supply	Retail Supply
Collection Loss	Retail Supply	Retail Supply	Retail Supply
Factors affected by loss allocation			
Possibility to manipulate losses	<input checked="" type="checkbox"/> In order to shift losses from collection inefficiency to other losses (hooking or meter tampering/ bypassing), the Supply Company would have to generate lesser billing from actual energy sold, which is unlikely because by doing so the supplier would be letting go of its revenue.	<input checked="" type="checkbox"/> Since both meter tampering/ bypassing and collection inefficiency losses are allocated to supply company, they would have no incentive to shift losses from collection inefficiency to meter tampering/ bypassing.	<input checked="" type="checkbox"/> Since all commercial losses are allocated to Supplier, it would make efforts to reduce them.
Hooking losses	<input checked="" type="checkbox"/> Supplier would have no incentive to report hooking cases.	<input checked="" type="checkbox"/> Supplier would have no incentive to report hooking cases.	<input checked="" type="checkbox"/> Since hooking losses are allocated to Supplier, it would have incentive to report such cases. Mechanism would be needed to enforce Distribution company to reduce them.
Meter tampering / bypassing losses	<input checked="" type="checkbox"/> Supplier would have no incentive to report meter tampering/bypassing cases.	<input checked="" type="checkbox"/> Supplier would have incentive to reduce the losses.	<input checked="" type="checkbox"/> Supplier would have incentive to reduce the losses.
Factors other than losses			
Conflict of Interest	<input checked="" type="checkbox"/> Duty to install meter is with the supplier itself, therefore as per section 55 of the EA 2003, the supplier would install meter and then supply electricity.		
Capital investment	<input checked="" type="checkbox"/> Supplier can invest capital but it may lead to non-uniformity and duplication of assets i.e. each supplier would install its own meters for their respective consumers.		
Ease of billing	<input checked="" type="checkbox"/> Both meter reading and bill generation with same entity.		
Number of visits to consumer	<input checked="" type="checkbox"/> Single visit required to consumer premises for meter reading and meter operations.		
Ease of consumer switching	<input checked="" type="checkbox"/> Change of metering asset may be required on changing the supplier.		

Approach 3 (D3C) for metering

Allocation of metering related activities under this approach would be as follows -

- Meter reading – Distribution Company
- Other metering activities – Distribution Company

Loss allocation	Approach 1 (D2A)	Approach 2 (D2B)	Approach 3 (D2C)
Technical Loss	Distribution	Distribution	Distribution
Hooking Loss	Distribution	Distribution	Retail Supply
Inaccurate Metering	Distribution	Retail Supply	Retail Supply
Meter tampering	Distribution	Retail Supply	Retail Supply
Collection Loss	Retail Supply	Retail Supply	Retail Supply
Factors affected by loss allocation			
Possibility to manipulate losses	<input type="checkbox"/> Distribution Company could inflate billing to hide meter tampering/ bypassing or hooking losses and shift them to collection inefficiency.	<input type="checkbox"/> Distribution Company could inflate billing to hide meter tampering/ bypassing or hooking losses and shift them to collection inefficiency.	<input checked="" type="checkbox"/> Since all commercial losses are allocated to Supplier, Distribution business cannot shift technical losses to commercial losses, thus would not have incentive to fudge meter readings.
Hooking losses	<input checked="" type="checkbox"/> Distribution Co. would have incentive to reduce the losses.	<input checked="" type="checkbox"/> Distribution Co. would have incentive to reduce losses.	<input type="checkbox"/> Distribution Co. would have no incentive to reduce losses.
Meter tampering / bypassing losses	Distribution Co. would have incentive to reduce the losses.	<input type="checkbox"/> Distribution Co. would have no incentive to reduce losses.	<input type="checkbox"/> Distribution Co. would have no incentive to reduce losses.
Factors other than losses			
Conflict of Interest	<input type="checkbox"/> As per section 55 of the Electricity (Amendment) Bill 2014, a licensee cannot supply electricity to a consumer without a metered connection. Therefore while the duty to install a meter would be applicable on Distribution Company, Supplier would be at loss if the Distribution Company does not abide by its responsibilities.		
Capital investment	<input type="checkbox"/> Distribution Company being State owned, with substantial accumulated losses, may find it difficult to invest capital for metering improvement.		
Ease of billing	<input type="checkbox"/> Meter reading and billing with separate entities i.e. Distribution and Retail Supply companies respectively. This could lead to disputes between the two entities.		
Number of visits to consumer	<input type="checkbox"/> Separate visits required for meter reading and meter operations.		
Ease of consumer switching	<input checked="" type="checkbox"/> No change required in metering when a consumer switches supplier.		

Approach 4 (D3D) for metering

Allocation of metering related activities under this approach would be as follows -

- Meter reading – 3rd Party Company
- Other metering activities – 3rd Party Company

Under this approach, assuming metering is a licensed activity, the 3rd party company which is brought in for metering services could also be allocated commercial losses related to inaccurate metering or meter bypassing/tampering. Therefore a separate loss allocation approach is also considered wherein inaccurate metering and meter tampering/bypassing losses are allocated to the 3rd party company.

Loss allocation	Approach 1 (D2A)	Approach 2 (D2B)	Approach 3 (D2C)	Approach 4
Technical Loss	Distribution	Distribution	Distribution	Distribution
Hooking Loss	Distribution	Distribution	Retail Supply	3 rd party company
Inaccurate Metering	Distribution	Retail Supply	Retail Supply	3 rd party company
Meter tampering	Distribution	Retail Supply	Retail Supply	3 rd party company
Collection Loss	Retail Supply	Retail Supply	Retail Supply	Retail Supply
Factors affected by loss allocation				
Possibility to manipulate losses	<input checked="" type="checkbox"/> 3 rd Party company would have no incentive to fudge losses, as losses are not its responsibility.			<input checked="" type="checkbox"/> 3 rd party company could inflate billing to shift losses to collection inefficiency.
Hooking losses	<input checked="" type="checkbox"/> 3 rd party would have no incentive to report or reduce loss.			<input checked="" type="checkbox"/> Since hooking losses are allocated to 3 rd party metering company, 3 rd party company would have incentive to report such cases. Mechanism would be needed to enforce Distribution company to reduce them. However the retail supply company would have no incentive to report hooking cases.
Meter tampering / bypassing losses	<input checked="" type="checkbox"/> 3 rd party would have no incentive to report or reduce loss.			<input checked="" type="checkbox"/> 3 rd party company would have incentive to reduce losses.
Factors other than losses				
Conflict of Interest	<input checked="" type="checkbox"/> As per section 55 of the Electricity (Amendment) Bill 2014, a licensee cannot supply electricity to a consumer without a metered connection. Therefore while the duty to install a meter would be applicable on 3 rd Party, Supplier would be at loss if the 3 rd party does not abide by its responsibilities.			
Capital investment	<input checked="" type="checkbox"/> 3 rd party can bring in capital and technology to do focus investments.			

Loss allocation	Approach 1 (D2A)	Approach 2 (D2B)	Approach 3 (D2C)	Approach 4
Ease of billing	<input type="checkbox"/> Meter reading and billing with separate entities i.e. Distribution and Retail Supply companies respectively. This could lead to disputes between the two entities.			
Number of visits to consumer	<input checked="" type="checkbox"/> Single visit required to consumer premises for meter reading and meter operations.			
Ease of consumer switching	<input checked="" type="checkbox"/> No change required in metering when a consumer switches supplier.			

Approach 5 (D3E) for metering

Allocation of metering related activities under this approach would be as follows -

- Meter reading – Retail Supply Company
- Other metering activities – Distribution Company

Loss allocation	Approach 1 (D2A)	Approach 2 (D2B)	Approach 3 (D2C)
Technical Loss	Distribution	Distribution	Distribution
Hooking Loss	Distribution	Distribution	Retail Supply
Inaccurate Metering	Distribution	Retail Supply	Retail Supply
Meter tampering	Distribution	Retail Supply	Retail Supply
Collection Loss	Retail Supply	Retail Supply	Retail Supply

Factors affected by loss allocation

Possibility to manipulate losses	<input checked="" type="checkbox"/> In order to shift losses from collection to other losses (hooking or meter tampering/bypassing), the Supply Company would have to generate lesser billing from actual energy sold, which is unlikely because by doing so the supplier would be letting go of its revenue.	<input checked="" type="checkbox"/> Since both meter tampering/ bypassing and collection efficiency losses are allocated to supply company, they would have no incentive to shift losses from collection inefficiency to meter tampering/ bypassing.	<input checked="" type="checkbox"/> Since all commercial losses are allocated to Supplier, it would make efforts to reduce them.
Hooking losses	<input checked="" type="checkbox"/> Appropriate entity will take care on consumer visit.	<input checked="" type="checkbox"/> Appropriate entity will take care on consumer visit.	<input checked="" type="checkbox"/> Appropriate entity will take care on consumer visit.
Meter tampering / bypassing losses	<input checked="" type="checkbox"/> Appropriate entity will take care on consumer visit.	<input checked="" type="checkbox"/> Appropriate entity will take care on consumer visit.	<input checked="" type="checkbox"/> Appropriate entity will take care on consumer visit.

Factors other than losses

Conflict of Interest	<input type="checkbox"/> As per section 55 of the Electricity (Amendment) Bill 2014, a licensee cannot supply electricity to a consumer without a metered connection. Therefore while the duty to install a meter would be applicable on Distribution Company, Supplier would be at loss if the Distribution Company does not abide by its responsibilities.
Capital investment	<input type="checkbox"/> Distribution Company being State owned, with substantial accumulated losses, may find it difficult to invest capital for metering improvement.
Ease of billing	<input checked="" type="checkbox"/> Both meter reading and bill generation with same entity.

Loss allocation	Approach 1 (D2A)	Approach 2 (D2B)	Approach 3 (D2C)
Number of visits to consumer	<input checked="" type="checkbox"/> Separate visits required for meter reading and meter operations.		
Ease of consumer switching	<input checked="" type="checkbox"/> No change required in metering when a consumer switches supplier.		

Competition in metering services

In case an approach is adopted wherein the responsibility of other metering related activities are given to a 3rd Party Metering Company, competition could be introduced in metering services as well. The retail supply companies could be given the option to choose from various metering service companies (approved by SERCs). Later the retail consumer could also be given the choice to select not only its retail supply company but also its metering company. The 3rd Party metering companies could be government owned (segregated from government Discoms) or private companies. Introduction of multiple private players in the metering sector would encourage efficiency and capital investment.

Issue 4 – Delimitation: Area of Supply and phasing of retail supply competition

Under this issue we discuss the mechanism through which the retail consumers would be gradually opened up for competition. This mechanism would have to be defined at two levels – delimitation of area of supply and phasing of retail consumers. Under delimitation of area of supply, the current license area of the discoms could either be opened to competition entirely at once or be broken down into smaller areas and gradually opened up for competition. Phasing of retail consumers would act as the next level of progressive introduction of competition. In each area of supply open for competition, only a particular set of consumers would be made contestable i.e. the new retail supply companies would be able to supply to only such contestable consumers, the remaining being served by their respective incumbent supply companies. This phasing of consumers within an area of supply could be based on factors like connected load, consumer categories etc.

The objectives of phasing and delimitation of area of supply are:

- Ensuring maximum incentive for consumer switching
- Attracting new players in retail supply space
- Providing opportunity for understanding the sector and settling down

Delimitation of Area of Supply

There can be two approaches for defining the area of supply to be given to the new Retail Supply Company:

- **D4A – Same area of supply:** The area of supply of incumbent retail supply company is offered to the new retail supply company as well
- **D4B – Breaking up of supply area:** The current area of supply would be broken down into smaller regions, in which the new Retail Supply Company would be allowed to supply electricity. Under this approach a package of cities or areas could also be offered to the new retail supply companies. These packages may consist of areas like –
 - An urban area with a rural area: while the urban area would be an attractive proposition for the new retail supply company due to higher consumer density and therefore greater revenues, the supplier could be given a rural area along with it so as to promote level playing field to all players and also promote rural electrification.

- An industrial area along with agricultural area: while an area with majority industrial consumers would be attractive proposition for new retail supply companies due to higher billing per consumer, the supplier could be given an area with majority agricultural consumers.

Depending upon the objectives of the state government for introducing retail supply competition, similar other packages for area of supply could be designed. The various packages formed should be comparable with each other in terms of parameters like consumer mix, loss levels, connected load patterns etc. This would ensure that new retail supply companies do not cherry pick within the packages.

The factors to be considered while deciding the approach for area of supply are –

- Current area size of incumbent discom
- Loss variation in the area of supply under review
- Consumer mix and sales mix in the area of supply under review

The approach to be adopted for defining area of supply for new retail supply companies is interdependent on approach to be adopted for Universal Service Obligation (USO). The approaches possible for USO are:

- **D5A (USO on incumbent supplier):** USO continues to be applied on incumbent Retail Supply Company for all consumers but not on new retail supply companies
- **D5B (USO on all suppliers):** USO continues to be applied on incumbent Retail Supply Company for all consumers. For retail consumers open for competition, the USO applies on new Retail Supply Companies as well

The table below discusses various pros and cons of the two possible approaches towards defining the area of supply:

Issue/Approach	Approach 1 (D4A) – same area of supply	Approach 2 (D4B) – breaking up area of supply
Parameters		
Current area of discom	<ul style="list-style-type: none"> ✓ USO on incumbent supplier: new supply company could choose whom to supply. ✗ USO on all suppliers: new retail supplier could find big area of supply as an entry barrier. 	<ul style="list-style-type: none"> ✓ bigger areas could be broken down to attract new players with less capital also.
Loss variation	<ul style="list-style-type: none"> ✓ average losses could be given to all suppliers. 	<ul style="list-style-type: none"> ✗ Suppliers could cherry pick areas with lower loss levels, to supply electricity. It would be important to take care of this while breaking down the area of supply.
Consumer profile	<ul style="list-style-type: none"> ✓ variation of consumer profiles would average out in a bigger area of supply. 	<ul style="list-style-type: none"> ✗ Suppliers could cherry pick areas with better consumer profiles, to supply electricity. It would be important to take care of this while breaking down the area of supply.

Phasing of retail supply competition

In a particular supply area, the retail competition can be introduced in phases, where in each phase, the new retail supply companies would be allowed to supply electricity to a certain section of consumers. This phasing of competition gives allows new industry players and consumers to acclimatise down and scale up their operations. There are two aspects to be taken care of while devising phases for introduction of competition –

- i. **Basis of dividing market sections** – the retail consumer market needs to be divided into several sections. Each of these consumer sections would then be opened up to retail supply competition one by one in different phases. The basis for dividing the market into sections can be connected load of consumers, area of supply or consumer category. Based on these factors there can be following approaches for phasing of retail supply competition –
 - **Based on increasing connected load:** Retail competition is first opened to consumers with connected load below a threshold (for e.g. < 20 kW) and gradually this limit is increased to get more consumers into retail supply competition. For deciding these threshold levels deliberations will be required from various stakeholders.
 - **Based on decreasing connected load:** Retail competition is first opened to consumers with connected load above a threshold (for e.g. > 100 kW) and gradually this limit is decreased to get more consumers into retail supply competition. For deciding these threshold levels deliberations will be required from various stakeholders.
 - **Based on increasing annual energy consumption:** Retail competition is first opened to consumers with average annual energy consumption below a threshold level (for e.g. 5000 units per annum) and gradually this limit is increased to get more consumers into retail supply competition. For deciding these threshold levels deliberations will be required from various stakeholders.
 - **Based on decreasing annual energy consumption:** Retail competition is first opened to consumers with average annual energy consumption above a threshold level (for e.g. 50,000 units per annum) and gradually this limit is decreased to get more consumers into retail supply competition. For deciding these threshold levels deliberations will be required from various stakeholders.
 - **Based on area of supply:** Certain supply areas are opened to retail supply competition first, giving consumers in those areas option to choose their retail supply company. Gradually other areas are brought under the retail supply competition purview. The factor for deciding which area of supply would be opened to competition first will require deliberations from various stakeholders.
 - **Based on consumer categories:** Certain consumer categories (for e.g. industrial) are opened to retail supply competition first, giving consumers in those categories option to choose their retail supply company. Gradually other consumer categories are brought under the retail supply competition purview. The factor for deciding which consumer categories would be opened to competition first will require deliberations from various stakeholders.
- (i) **Timelines for each phase** - timelines for phasing of Retail Supply competition will require discussions, study and analysis of the requisite environment necessary for introducing retail sector reforms. There can be two approaches for defining timelines of phasing –
 - Fixed nation-wide timeline
 - State Government could devise separate timelines for their respective supply areas, with upper time limits being defined in the Act.

The pros and cons of these approaches are as follows –

Approach	Pros	Cons
Approaches for selecting criterion for phasing		
<ul style="list-style-type: none"> Increasing connected load 	<ul style="list-style-type: none"> Greater efficiency: Since consumer with lower connected loads are connected at LT level which accounts for maximum technical and commercial losses in the system, introducing competition at this level will help in reducing AT&C losses faster and would bring greater efficiency. Prevention of cherry picking: under increasing connected load approach of phasing the subsidizing consumers (industrial and commercial) would not be opened for competition initially instead the subsidized consumers (domestic and agricultural) would become contestable. Therefore the new retail supply companies would not get an opportunity to cherry pick. 	<ul style="list-style-type: none"> Difficulty in implementation: Implementing competition at lower connected load first would bring in large number of consumers spread over the entire geography of the distribution license area, under the purview of competition. This would entail huge investment from the new retail supply companies and more power purchase requirement to meet possible demand. Any lack in implementation at this scale would have a huge negative impact on the overall scheme and leave lesser opportunity for course correction. Nonstarter for reforms: new retail supply companies could find this proposition not attractive since consumers with lower load could have higher losses or lower revenues. The cost of switching a consumer may be more than benefits derived.
<ul style="list-style-type: none"> Decreasing connected load 	<ul style="list-style-type: none"> Since electricity forms a greater part of costs for consumers with larger connected load, they would be more likely to take advantage of supply competition Lower losses among consumers with larger connected load would be an incentive for new private players to enter into retail supply business 	<ul style="list-style-type: none"> In case cross subsidies and loss levels are not improved before introduction of retail supply competition, a large number of good consumers of existing supply companies could migrate (cherry picking by other supply companies)
<ul style="list-style-type: none"> Increasing annual consumption 	<ul style="list-style-type: none"> Greater efficiency: Since consumer with lower annual consumption are connected at LT level which accounts for maximum technical and commercial losses in the system, introducing competition at this level will help in reducing AT&C losses faster and would bring greater efficiency. 	<ul style="list-style-type: none"> Changing consumption patterns: increase or decrease of energy consumption during a period could pose difficulties in deciding whether a consumer should be allowed for supply competition or not Difficulty in implementation: Implementing competition at lower annual sales first would bring in large number of consumers under the purview of competition. This would entail huge investment from the new retail supply companies and more power purchase requirement to meet possible demand. Any lack in

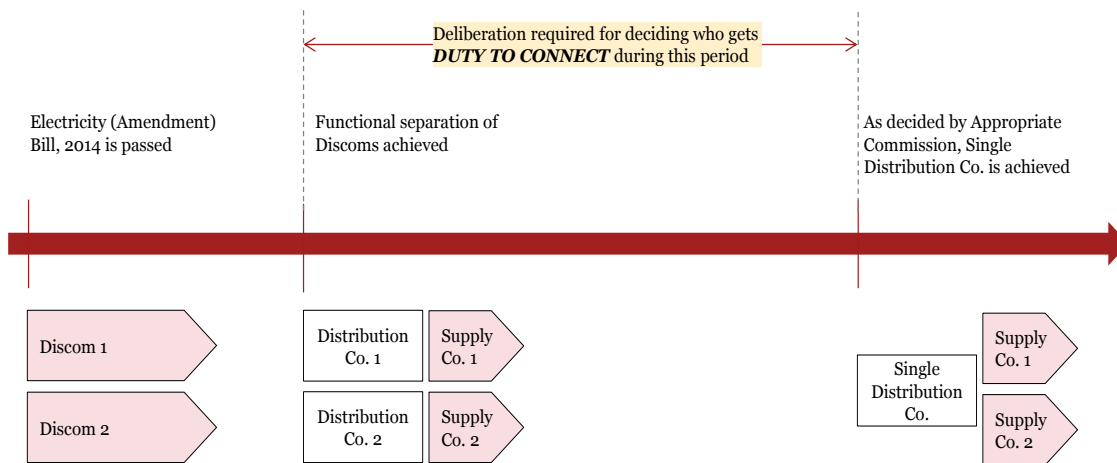
Approach	Pros	Cons
		<p>implementation at this scale would have a huge negative impact on the overall scheme and leave lesser opportunity for course correction.</p> <ul style="list-style-type: none"> • Nonstarter for reforms: new retail supply companies could find this proposition not attractive since consumers with lower annual sales could have higher losses or lower revenues. The cost of switching a consumer may be more than benefits derived.
<ul style="list-style-type: none"> • Decreasing annual consumption 	<ul style="list-style-type: none"> • Since electricity forms a greater part of costs for consumers with greater energy consumption, they would be more likely to take advantage of supply competition 	<ul style="list-style-type: none"> • Changing consumption patterns of consumers could pose difficulties in deciding whether a consumer should be allowed for supply competition or not
<ul style="list-style-type: none"> • Area of Supply 	<ul style="list-style-type: none"> • Areas with lower loss levels could be identified and opened to competition first to attract new retail supply companies • Or vice versa, areas with greater losses could identified and opened to competition first to promote efficiency • Pilot scheme could be introduced in some areas to gather feedback and response 	<ul style="list-style-type: none"> • Determination and allocation of area wise losses and costs between retail supply companies would be an issue. Circle wise losses and costs are difficult to be determined.
<ul style="list-style-type: none"> • Consumer categories 	<ul style="list-style-type: none"> • Consumer categories with lower loss levels could be identified and opened to competition first to attract new retail supply companies • Or vice versa, consumer categories with greater losses could identified and opened to competition first to promote efficiency 	<ul style="list-style-type: none"> • Determination and allocation of area wise losses and costs between retail supply companies would be an issue. Circle wise losses and costs are difficult to be determined.
Approaches for setting timelines for phasing		
1. Fixed nation-wide timelines	<ul style="list-style-type: none"> • Greater accountability on State Governments to bring in reforms in a timely manner 	<ul style="list-style-type: none"> • States in different phases of reforms could find it difficult to adhere to a common timeline • Getting a political consensus for common timeline could be a non-starter
2. State wise timelines	<ul style="list-style-type: none"> • Greater flexibility to States 	<ul style="list-style-type: none"> • State may delay the implementation of reforms

Issue 5 – Universal Service Obligation (USO)

The Universal Service Obligation (USO) refers to the practice of providing a baseline level of services to every consumer. The Universal Service Obligation can be split into two separate obligations -

- i. 'The 'Duty to Connect'
- ii. 'The 'Duty to Supply'

The duty to connect a consumer would lie with the distribution business. In areas like Mumbai wherein multiple Distribution Companies exist simultaneously, it needs to be deliberated whether after the introduction of Retail Supply Competition which one of them would get the Duty to Connect consumers. One of them would have to divest their network assets so as to ensure there is a single Distribution network provider in any area of supply. However till such time, the appropriate SERC would have to determine which distribution company(s) would get the 'Duty to Connect'.



USO in the retail supply sector translates into Duty to Supply wherein if a consumer approaches a retail supplier and demands supply of electricity and service at same costs as other consumers of same category (and/or area of supply), the retail supplier would have an obligation to fulfil that demand of consumer. After the introduction of new retail supply companies into an area of supply, the issue arises whether or not the new retail supply companies should have USO (Duty to Supply) obligation for consumers open to retail supply competition in their respective area of supply. There can be two approaches going forward for USO after the introduction of new retail supply companies –

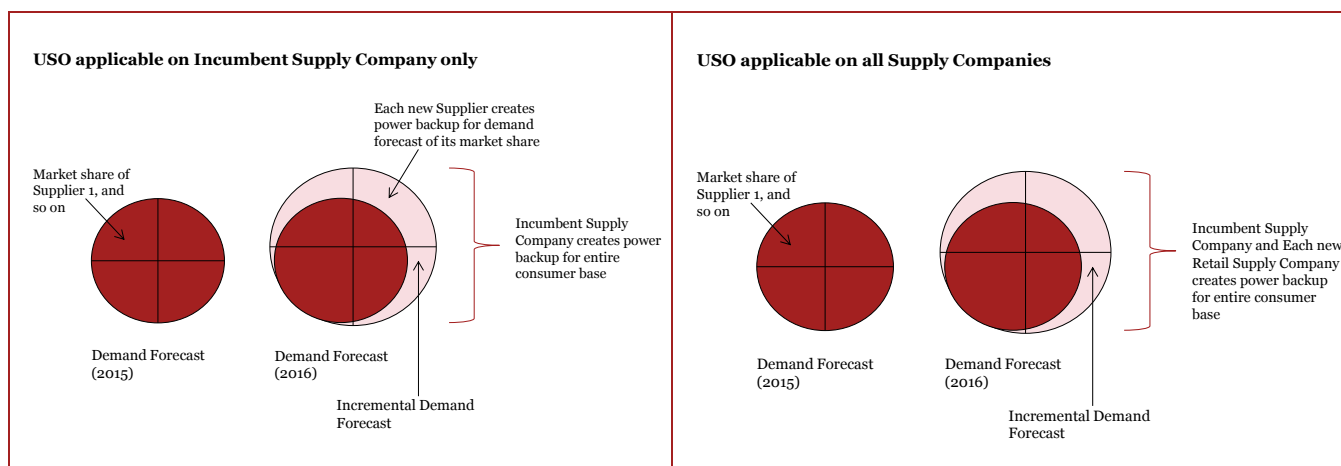
1. **D5A: USO continues to be applied on incumbent Retail Supply Company for all consumers but not on new retail supply companies**

In this approach the new retail supply company would not have an obligation to supply electricity to a consumer. The new retail supply companies need not procure power for all incremental energy sales expected for all consumers, since USO would not apply on them. Only the incumbent supplier would have to make arrangements for all consumers in case it is called upon to service USO obligation

2. **D5B: For retail consumers open for competition, the USO applies on all Retail Supply Companies. For consumers not open for competition, USO only on incumbent Retail Supply Company.**

In such a scenario all retail supply companies would have to make arrangements for all consumers. However in case power is not available with supplier, it will have to either -

- Refuse to supply and pay penalty, or
- Procure power inefficiently and pass on the costs to consumers (subject to ceiling tariffs set by SERCs)



*the demand forecast charts in above diagram are for consumers open for competition

While deciding which approach to adopt, following issues would have to kept in mind –

- Availability of surplus electricity and power procurement planning to fulfil USO obligations
- Scrutiny and penalty mechanism for non-adherence to USO obligations

Issue/Approach	Approach 1 (D5A)	Approach 2 (D5B)
USO Obligation		
For consumers open to competition	USO obligation on Incumbent Retail Supply Company	USO obligation on all Retail Supply Companies
For consumer not open to competition	USO obligation on Incumbent Retail Supply Company	USO obligation on Incumbent Retail Supply Company
Issue		
Energy availability and planning	✓ only the incumbent retail supply company would have to make arrangements for all consumers in case it is called upon to service USO obligation	✗ all retail suppliers would have to make arrangements for all consumers open for completion in case they are called upon to service their USO obligations. In a supply constrained scenario this may not be possible or may lead to excess generation capacity.
Scrutiny and penalty mechanisms	✓ the incumbent Retail Supply Company being the POLR will be allowed to collect a regulated tariff as allowed by SERCs	~ it will need to be deliberated that based on what conditions will a Retail Supply Company be allowed to refuse service to the consumer.

Efficient power procurement techniques for changing demand forecasts

Based on the mechanism of Demand Forecasting, the approach towards USO obligation and the frequency at which this activity is done, an efficient power procurement mechanism would also need to be developed for new retail supply companies in order to meet their demand forecasts. The new retail supply companies could procure power from Wholesale Markets, by entering into new individual PPAs with generators or through allocation of PPA/Power by Intermediary Company. The issues with each of these power procurement routes are as follows –

- **Wholesale Markets** – medium to long term wholesale markets are not sufficiently developed in India. Therefore if the frequency of change in demand forecast is high i.e. the time period between changes in the demand forecasts of a Retail Supply Company is small, then Wholesale Markets could prove to be a good power procurement mechanism to account for changes in demand forecasts.
- **New individual PPAs with generators** – PPAs are generally for very long time periods of up to 30 years. Therefore if the frequency of change in demand forecast is very low i.e. the time period between changes in the demand forecasts of a Retail Supply Company is very high, then entering into new PPAs could prove to be a good power procurement mechanism to account for changes in demand forecasts.
- **Allocation of Power/PPAs by Intermediary Company** – in case of energy deficit scenario wherein enough untied capacity is not available in the market, PPAs transferred to Intermediary Company would have to be allocated between new retail supply companies. However these PPAs also would be of longer terms. Therefore for matching the frequency of demand forecasting with the allocation of PPAs, the following two approaches could be adopted –
 - The Intermediary Companies could adopt a dynamic approach of allocating PPA/Power. Therefore at a pre-determined frequency the allocation of PPAs to retail supply companies would be refreshed to take care of any changes in the demand forecasts.
 - The Intermediary Company could adopt a fixed approach of allocating PPA/Power. Thereafter if the demand forecasts of retail supply companies change, they may trade power among themselves to account for such changes.

The supply companies could also adopt a hybrid approach based on the pattern of their demand forecasts.

Issue 6 – Allocation of PPAs

After the introduction of second Retail Supply Company in an area of supply, mechanism would have to be developed so that these new supply companies can procure power to meet the electricity demand of their consumers. There can be following possible ways for the new suppliers to procure power for their electricity demand, except for demand that they can meet by their own generation plants (if any) –

- **Wholesale electricity market or New PPAs with individual generators:** under this method, the New Retail Supply Company first goes to market or individual generators to procure power. Then it asks Intermediary Company to allocate PPA/Power for any remaining requirements.
- **Allocation of PPA by Intermediary Company:** as per this method, the new Retail Supply Company mandatorily takes power from Intermediary Company (IC). Then it goes on to procure power from market or individual generators for any remaining requirements.

However till such time the wholesale electricity market is still in nascent stages, PPA would remain an important method of power procurement. The new retail supply companies could either enter into new PPAs with the generators or ask the Intermediary Company to allocate PPAs/Power to it. Therefore a mechanism

would have to be developed to allocate the current PPAs with the Intermediary Company, to new retail supply companies i.e. a mechanism to expend the electricity supply with the Intermediary Company. From the point of view of Intermediary Company, there can be following possible mechanisms for allocating Power/PPA to retail supply companies –

- a. **Allocation to Incumbent Supply Company:** Intermediary Company first fulfils the entire power requirements of incumbent retail supply company, then allocates the remaining PPAs/Power to the new retail supply company.
- b. **Allocation to new Retail Supply Company:** Intermediary Company first fulfils the entire power requirements of new retail supply company, then allocates the remaining PPAs/Power to the incumbent retail supply company.
- c. **Proportionate allocation to all Supply Companies:** Intermediary Company devises a formula to allocate power/PPA to all retail supply companies, meeting power requirement for each them partially or fully.

The allocation of PPAs by Intermediary Company to retail supply companies would initially be done taking into consideration the business plan (approved by commission) submitted by the retail supply companies. As the market matures the allocation could be done on actual market share basis.

Combining the various mechanisms available to new Retail Supply Company and Intermediary Company, the following 6 possible approaches can be developed for allocating PPAs –

- **D6A:** RSL → IC → Market | IC → ISL → RSL
New Retail Supply Company mandatorily asks and accepts power/PPA from IC. IC fulfils the power requirements of incumbent supply company, and then allocates power/PPA to new Retail Supply Company.
- **D6B:** RSL → Market → IC | IC → ISL → RSL
New Retail Supply Company first goes to market or generators to procure power then ask IC for any remaining requirement. IC fulfils the power requirements of incumbent supply company, and then allocates power/PPA to new Retail Supply Company.
- **D6C:** RSL → IC → Market | IC → RSL → ISL
New Retail Supply Company mandatorily asks and accepts power/PPA from IC. IC fulfils the power requirements of new retail supply company first and then allocates power/PPA to incumbent retail supply company.
- **D6D:** RSL → Market → IC | IC → RSL → ISL
New Retail Supply Company first goes to market or generators to procure power then ask IC for any remaining requirement. IC fulfils the power requirements of new retail supply company first and then allocates power/PPA to incumbent retail supply company.
- **D6E:** RSL → IC → Market | IC → Proportionate allocation
New Retail Supply Company mandatorily asks and accepts power from IC. IC based on a formula allocates power/PPA to all retail suppliers to meet partial or complete requirements for each of them.
- **D6F:** RSL → Market → IC | IC → Proportionate allocation
New Retail Supply Company first goes to market or generators to procure power then ask IC for any remaining requirement. IC based on a formula allocates power/PPA to all retail suppliers to meet partial or complete requirements for each of them.

PPA allocation approaches		Mechanism by Intermediary Company		
		a (first incumbent)	b (first new supplier)	c (allocation to all)
Mechanism by new supplier	1 (IC first)	D6A	D6C	D6E
	2 (Market first)	D6B	D6D	D6F

However based on the market conditions, each of the approaches discussed above could have different outcomes for suppliers as well as the Intermediary Company. There are two aspects of the market conditions that need to be taken care of while evaluating the above mentioned approaches of PPA allocation -

- **Availability of Energy:** whether the state under review is energy surplus or deficit
 - Energy Deficit States - There isn't enough tied up generation capacity in the market to make new PPAs
 - Energy Surplus States – If the new retail supply company enters into new PPAs, the Intermediary company could be left with surplus PPAs which it would not be able to pay for in case new retail supply companies break away consumers of incumbent supply company
- **Cost of PPAs:** whether the existing PPAs are expensive or cheaper than the power available in the market
 - Existing PPAs are expensive than the power available in the market
 - Existing PPAs are cheaper than the power available in the market

Therefore there are following possible market scenarios –

Market Scenarios		Availability of Energy	
		Energy Surplus	Energy Deficit
Cost of PPAs	PPAs expensive than market	I	III
	PPAs cheaper than market	II	IV

In order to simulate the opportunity gain/loss for all entities in case of each approach discussed above, under various market scenarios discussed above, illustrations are shown in appendix 3 of this report.

Therefore based on the market scenario (energy deficit or energy surplus) of respective states and the risk appetite of State Governments to allow loss to Intermediary Company, one of the approaches will have to be adopted that best suits the respective states. The selection of approach can be guided by the following factors –

- Approach adopted should be such that financial losses to Intermediary Company can be avoided, as the Intermediary Company would not have any assets to setoff these losses
- Approach adopted should be such that any opportunity gain or loss to be made by retail supply companies gets distributed among them proportionately.

After deciding upon the approach to be followed for allocation of PPAs between IC and retail supply companies the following questions would also need discussion while forming the roll out plan of individual states -

1. **Who bears the financial loss in case Intermediary Company is unable to fulfil its PPA obligations** – The IC may not pay generators for their PPAs if Retail Supply Companies either refuse

to take on the PPAs or are unable to make timely payments. In such a scenario who would bear the financial loss is an issue for discussion. The possible approaches in such a scenario could be:

- i. State Government Support** – the state government could fund the losses of Intermediary Company.
 - ii. Socialisation through universal charge** – the losses could be passed on to all consumers of all retail supply companies in the form of a universal charge.
- 2. PPA or Power allocation** - There can be two approaches for allocation of PPAs:
 - i.** Allocation of PPA – Individual PPAs are allocated to various retail supply companies. In this case the Retail Supply Company will have to pay the power purchase costs as per the PPA allocated to them.
 - ii.** Allocation of power – The Intermediary Company could allocate power to Retail Supply Companies i.e. the PPAs could be broken or combined to meet power requirements of Retail Supply Companies.
- 3. Parameters basis which allocation will be done** – as per the 3rd mechanism by Intermediary Company could allocated PPAs between Retail Supply Companies, a formula will need to be derived for allocation taking into consideration factors like Duration of PPAs, average/peak demand of consumers with each Supply company, consumer mix of Supply companies, size of PPAs, etc.
- 4. Price for allocation:** In case the allocation is done of power and not actual PPA, the price at which the power would be allocated would be the next issue. The following approaches can be adopted for determining the price which will be charged from Retail Supply Companies by Intermediary Company for allocated power:
 - i.** Uniform/Average cost: Intermediary companies can charge an average power purchase cost to all retail supply companies.
 - ii.** Differential Bulk Supply Tariff: A formula is derived wherein each individual Retail Supply Company is charged a different power purchase price by the Intermediary Company.

It is to be noted that the rate at which power is allocated to various Supply Companies by the Intermediary Company could lead to inter-regional or inter-category cross subsidies.

- 5. Fixed or Dynamic allocation of PPAs/Power** – when multiple retail supply companies would exist, the allocation of PPAs between them can be done in two ways, fixed or dynamic. One of the following approaches would have to be selected for allocation of PPAs –
 - i.** Fixed Allocation of PPAs/Power – The PPAs could be allocated between various retail supply companies based on certain parameters. In case consumers shift from one retail supply company to another, leaving a supply company power surplus while other retail supply company power deficit, the retail supply companies can trade power between them to account for such imbalance.

An issue of deliberation will be that how fixed allocation of PPAs will be revised if a new retail supply company comes in a supply area. An approach would be revisiting the fixed allocation factors each time a new retail supply company gets added.
 - ii.** Dynamic Allocation of PPAs/Power – The initial allocation of PPAs between the Retail Supply Companies is refreshed at fixed intervals (as decided by the appropriate Commission or regulatory body) based on factors like consumer mix, number of consumers, energy sales or connected load of each Retail Supply Company at the end of this interval.

The pros and cons of these issues are as follows –

Approach	Pros	Cons
Regarding price of allocating PPAs		
<ul style="list-style-type: none"> Actual cost of PPA 	<ul style="list-style-type: none"> Ease of settlement between generator and retail supply company 	<ul style="list-style-type: none"> Certain Retail Supply Companies could get stuck with costlier PPAs or PPAs which expire soon Inter-regional or inter-category cross subsidies could get created
<ul style="list-style-type: none"> Uniform/Average cost 	<ul style="list-style-type: none"> Level playing field could be created for all retail supply companies 	<ul style="list-style-type: none"> Settlement with generators due to several escalable and non escalable components could become an issue
<ul style="list-style-type: none"> Differential Bulk Supply Tariff 	<ul style="list-style-type: none"> Could be used as a tool for cross subsidy management 	<ul style="list-style-type: none"> Inter-regional or inter-category cross subsidies could get created
Regarding allocation mechanism		
<ul style="list-style-type: none"> Fixed allocation of PPAs/Power 	<ul style="list-style-type: none"> No need to define consumer switching frequency. Supply companies will have to trade power among themselves to account for any change in consumer base 	<ul style="list-style-type: none"> Mechanism would have to be developed for trading among retail supply companies Accounting for different duration of PPAs would become more complex due to inability to refresh allocation based on consumer base of supplier
<ul style="list-style-type: none"> Dynamic allocation of PPAs/Power 	<ul style="list-style-type: none"> Will allow Intermediary Company to adopt for any changes in power scenario in future 	<ul style="list-style-type: none"> The frequency at which consumers would be allowed to switch supplier would have to be linked with frequency of dynamic allocation of PPAs

Alternative roll out plans for introduction of retail supply competition

As discussed in the previous sections, for the introduction of competition in retail sale of electricity, several tasks would have to be performed in three stages namely functional separation, preparation for competition and onset of competition. Further we highlighted several issues that may arise while implementing these tasks and possible approaches to resolve each of these issues. These approaches were then evaluated based on various sector scenarios and contributing factors. Since the sector scenarios and contributing factors may vary from state to state in India and also the interpretation of these factors may vary, we have devised alternative roll out plans based on these variations.

Various current scenarios

Factors based on which various current scenarios can be defined, are as follows –

- **Current level of Transmission and Distribution (T&D) losses:** based on the current level of losses, the responsibility of AT&C losses is allocated between Distribution and Supply Functions. Further based on the loss allocation the metering responsibility is also given to either Retail Supply or Distribution functions. The possible scenarios for current level of losses are defined as follows -
 - **High** – where the T&D losses (AT&C loss less collection inefficiency loss) are more than 15%
 - **Low** – where the T&D losses (AT&C loss less collection inefficiency loss) are less than or equal to 15%
- **Availability of Power:** based on the availability levels of power in a state, the approach towards ‘Transfer of existing PPAs’ from current Discom to Intermediary Company and ‘Allocation of PPAs’ between retail supply companies are decided. The possible scenarios for availability of power are defined as follows -
 - **Energy Surplus** – where the current Discom has power procurement arrangements for *more* than its energy requirement
 - **Energy Deficit** – where the current Discom has power procurement arrangements for *less* than its energy requirement

Based on the permutation and combinations of these factors, 4 scenarios are defined and a roll out plan is devised for each of these scenarios.

Treatment of issues/tasks for 4 scenarios

The treatment of various issues/tasks for 4 scenarios would be as follows -

- **Allocation of Technical and Commercial Losses and Metering Services:**
 - There are three possible approaches to allocate losses between Distribution and Retail Supply businesses.

Type of Loss	Allocation to -		
	Approach (D2A)	Approach (D2B)	Approach (D2C)
Technical	Distribution	Distribution	Distribution
Commercial			
Theft by Hooking	Distribution	Distribution	Retail Supply
Inaccurate metering	Distribution	Retail Supply	Retail Supply
Theft by Meter tampering/bypassing	Distribution	Retail Supply	Retail Supply
Collection inefficiency loss	Retail Supply	Retail Supply	Retail Supply
	✓	✗	✓

However out of these, approach 2 (D2B) requires high level of metering in order to distinguish between hooking losses and other commercial losses. Since the level of metering is low and unreliable in majority of the license areas, this approach would be very difficult to implement. Therefore based on the current level of losses in a respective license area, either approach 1 (D2A) or approach 3 (D2C) can be adopted.

Further the approach to be adopted towards metering would depend on the approach adopted towards loss allocation. There are five possible approaches for the metering services.

Approach/Activity	Meter Reading	Other Meter related	
Approach 1 (D3A)	Retail Supply Company	3 rd Party	✗
Approach 2 (D3B)	Retail Supply Company	Retail Supply Company	✓
Approach 3 (D3C)	Distribution Company	Distribution Company	✓
Approach 4 (D3D)	3 rd Party	3 rd Party	✗
Approach 5 (D3E)	Retail Supply Company	Distribution Company	✓

However since the Electricity Amendment Bill 2014, does not envisage the metering service to be a separate licensed activity, a 3rd party metering company (if any) would not be governed by SERC regulations. In such a scenario the responsibility of metering related activities would lie with either retail supply or distribution business itself, who can then outsource a particular activity to a 3rd party company. Therefore based on the approach adopted towards loss allocation, either approach 2 (D3B), approach 3 (D3C) or approach 5 (D3E) can be adopted.

○ **Scenario - High current level of losses:**

- **Allocation of Technical and Commercial losses** - In license areas where the current level of losses is high, the balance sheet of distribution business may not be able to sustain these losses. Therefore the entire commercial losses could be allocated to the retail supply business. This translates to approach 3 (D2C) of loss allocation.
- **Metering** - Further in this scenario since majority of the losses are allocated to retail supply business the metering responsibility is also allocated to the retail supply business as per approach 2 (D3B) of metering services.

○ **Scenario - Low current level of losses:**

- **Allocation of Technical and Commercial losses** - In license areas where the current level of losses is on the lower side, the commercial losses other than collection inefficiency could be allocated to the distribution business. This translates to approach 1 (D2A) of loss allocation.

- **Metering** - Further in this scenario since majority of the losses are allocated to distribution business the metering responsibility is also allocated to the distribution business as per approach 3 (D3C) of metering services.

- **Transfer and Allocation of PPAs:**

- As discussed earlier in the section ‘Stages of introducing retail supply competition’ under the heading ‘Transfer of existing PPAs’, there are three approaches for transferring PPAs to the Intermediary Company, as follows –
 - **Transfer all PPAs** of current Discom to Intermediary Company
 - **Transfer select PPAs** of current Discoms to Intermediary Company (for instance certain expensive PPAs can be dissolved i.e. their power is to be sold through wholesale market while the remaining PPAs to be transferred to Intermediary Company)
 - **Transfer partial PPAs** of current Discoms to Intermediary Company (a certain percentage of power from all PPAs could be transferred to Intermediary Company while the rest of the power to be sold in wholesale market)

Detailed analysis of the power procurement arrangements of the existing Discom would have to be done in order to identify the right approach for shifting of PPAs to a wholesale market (by either transfer of select PPAs or transfer of partial PPAs). However based on the availability of Power, it can be decided whether all PPAs should be transferred to the Intermediary Company or some PPAs can be shifted to the wholesale market.

- There are six possible approaches to PPA allocation.

PPA allocation approaches		Mechanism by Intermediary Company		
		a (first incumbent)	b (first new supplier)	c (allocation to all)
Mechanism by new supplier	1 (IC first)	D6A: RSL → IC → Market IC → ISL → RSL	D6C: RSL → Market → IC IC → RSL → ISL	D6E: RSL → IC → Market IC → proportionate allocation
	2 (Market first)	D6B: RSL → Market → IC IC → ISL → RSL	D6D: RSL → Market → IC IC → RSL → ISL	D6F: RSL → Market → IC IC → proportionate allocation

Based on the illustrations (in appendix 3), in order to distribute any potential opportunity gain/loss proportionately among all retail supply companies and in order to avoid financial losses to the Intermediary Company, either approach 5 (D6E) or approach 6 (D6F) can be adopted.

- **Scenario - Energy Surplus:**

- **Transfer of existing PPAs** – under this scenario, some of the PPAs which are in addition to the energy requirements, could be shifted to wholesale market in order to promote efficiency in power procurement of retail suppliers.
- **Allocation of PPAs** – in an energy surplus scenario, approach 5 (D6E) of PPA allocation could be adopted for matching the power demand of Retail Supply Companies with the power supply of Intermediary Company. As per this approach the Intermediary Company allocates power proportionately between all Retail Supply Companies and the Retail Supply Companies have to mandatorily accept this power. The RSL is mandated to accept power from Intermediary Company because in an energy surplus scenario, any power left unallocated with the intermediary company could cause financial loss to the Intermediary Company.

○ **Scenario - Energy Deficit:**

- **Transfer of existing PPAs** - in an energy deficit scenario, there would be no improvement in power procurement efficiency by shifting PPAs to wholesale market, as the generators in an energy deficit scenario would have undue bargaining power in a wholesale market and could inflate electricity prices. Therefore in this scenario, all the existing PPAs are transferred to the Intermediary Company.
- **Allocation of PPAs** - in an energy deficit scenario, approach 6 (D6F) of PPA allocation could be adopted for matching the power demand of Retail Supply Companies with the power supply of Intermediary Company. As per this approach the Intermediary Company allocates power proportionately between all Retail Supply Companies However the RSL has the option to procure power from market first and then approach Intermediary Company for any additional requirements. The RSL is allowed to procure power from market first because in an energy deficit scenario, the ISL should be able to lift all existing PPAs from Intermediary Company reducing the chances of any financial loss to the Intermediary Company.

Treatment of other major issues/tasks

The approach to be adopted for issues and tasks discussed below are not dependent on the current scenario of the state/Discom, and therefore would remain same across all alternative roll out plans.

- **Universal Service Obligation** – in order to prevent cherry picking among retail supply companies, the USO would be applicable on all retail supply companies for consumer categories open for competition. For RSLs, the USO would apply for contestable consumers i.e. consumers which are open to competition, while for ISL the USO would be applicable on all consumers.

Issue/Approach	Approach 1 (D5A)	Approach 2 (D5B)
USO Obligation		
For consumers open to competition	USO obligation on Incumbent Retail Supply Company	USO obligation on all Retail Supply Companies
For consumer not open to competition	USO obligation on Incumbent Retail Supply Company	USO obligation on Incumbent Retail Supply Company
	✘	✔

- **Cross Subsidy** – as discussed in the section ‘Stages of introducing retail supply competition’ under the heading ‘Reduction of Cross Subsidies’ there are four possible approaches for reduction of cross subsidies, as follows:

S. No.	Approaches for cross subsidy reduction	
1	Year on Year tariff hikes	✘
2	Universal Charge (UC) fund	✔
3	Limiting subsidies to wheeling charges	✘
4	Direct Subsidy from State Government	✔

Considering high level of cross subsidies for some categories in certain states, the approach of ‘Year on Year tariff hikes’ could lead to tariff shocks. Also the wheeling charges may not be sufficient to subsume the high level of cross subsidies. Therefore either approach 2 of UC fund or approach 4 of Direct

Subsidy could be adopted. Irrespective of the current scenarios of the state/Discom, any of these two approaches could be adopted towards cross subsidy reduction.

- **Consumer Database** – in order to ensure an independent approach and neutral access of consumer database to all retail supply companies, the database could be maintained by the Distribution Company. The retail suppliers would collect and share data with distribution business regarding the consumers under their respective jurisdiction. The distribution company would share this database with commissions, intermediary company, retail supply companies and any other player as required.
- **Provider of Last Resort** – after the introduction of retail supply competition, the responsibility of POLR during the first year would lie with the incumbent retail supply licensee. Later on the appropriate SERC may define the supplier which is to act as POLR for retail consumers.
- **Consumer Interface** – there are three approaches for the consumer interface, as follows

S. No.	Approaches for consumer interface	
1	Single window interface by Retail Supply Companies	✓
2	Single window interface by Distribution Company	✗
3	Separate interface by Retail Supply and Distribution Company	✗

In order to facilitate ease of access to consumers the approach of single window can be adopted instead of separate interface by Distribution Company and Retail Supply Company. Further since the retail supply company would handle the commercial part of the electricity business, they can create better synergies and operational efficiencies in consumer service as well. Therefore for consumer interface, approach 1 could be adopted wherein a single window interface is provided by Retail Supply Companies.

- **Consumer Switch mechanism** – regarding the frequency of consumer switching, a one year lock in period could be kept i.e. after a consumer switches its retail supplier, he/she will have to continue with that retail supplier for at least next one year. This period can be reduced later by the appropriate commission as required. In case dynamic PPA allocation approach is adopted i.e. the quantum of PPAs allocated between various retail supply companies is revised at a certain frequency, the time of lock in period could also be linked with that frequency. This would help retail supply companies in managing their business planning and demand forecasting activities.
- **Standards of Performance** – based on the segregation of roles and responsibilities between the retail supply and distribution business, the Standards of Performance for each business would have to be defined separately.
- **Tariff Determination** – the appropriate SERCs would have to determine un-bundled tariffs separately for Distribution and Retail Supply businesses. The Distribution business being a monopoly business would be allowed a regulated tariff. Regarding the tariff for retail supply business, for non-contestable consumers i.e. consumers not open for competition, the appropriate SERCs would determine regulated tariffs while for contestable consumers i.e. consumers open for competition, the appropriate SERCs would determine a ceiling tariff. The need for determining ceiling tariff may be reviewed by SERCs in future in case sufficient competition exists.
- **Phasing of Retail Supply Competition** – phasing of retail supply competition refers to practice of gradually opening up the consumer base to competition i.e. allowing new retail supply companies to compete for only certain sections of consumer base initially and then gradually adding other consumer sections to this contestable consumer base. There are several factors basis which the phasing of competition can be done. These factors are connected load of consumer, energy consumption of

consumer, area of supply or consumer category. Further the phasing can be done in an increasing or decreasing fashion based on these factors.

S. No.	Approaches for Phasing of competition	
1	Increasing connected load	✓
2	Decreasing connected load	✓
3	Increasing energy consumption	✗
4	Decreasing energy consumption	✗
5	Based on area of supply	✗
6	Based on consumer category	✗

Under the decreasing connected load or decreasing energy consumption method the consumers with higher connected load or energy consumption would be opened for competition first and then gradually decreasing the limit to allow other consumers into purview of competition. On the other hand under the increasing connected load or increasing energy consumption method the consumers with lower connected load or energy consumption would be opened to competition first and gradually the limit would be increased. Since it is difficult to determine area wise/circle wise losses and costs, phasing based on area of supply would be difficult to implement. Similarly using consumer category as a factor would require determining consumer category wise losses which would also be difficult to implement. Further using energy consumption as a factor would pose operational difficulties in identifying consumers open for competition as the energy consumption of a consumer could change frequently. Therefore the approach to be adopted towards phasing could be either increasing connected load or decreasing connected load of consumers.

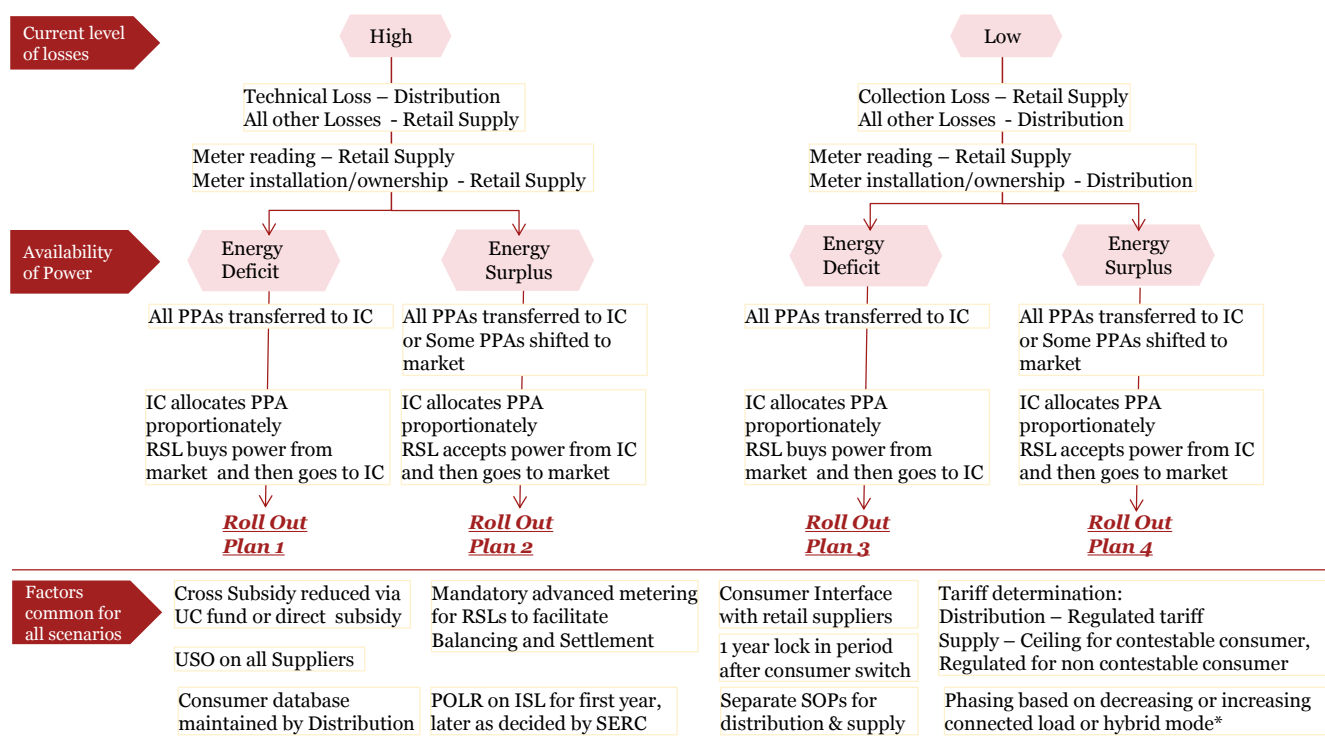
- **Phasing based on Increasing Connected Load:** Increasing connected load approach will help in driving efficiency improvement through loss reduction among consumers with lower connected loads like LT consumers. Since LT consumers could account for a major part of commercial losses, new retail supply companies could target loss reduction among such consumers so as benefit form efficiency improvements. Also excluding HT/EHT consumers from the retail supply competition in initial phases would prevent cherry picking (in case cross subsidies are not removed completely). However this approach of phasing, coupled with USO, might be difficult to implement and become a non-starter for reforms for large states. This approach may be adopted in smaller states/UTs like Chandigarh, Goa and Puducherry etc.
- **Phasing based on decreasing connected load:** as per this approach the competition is first opened to consumers with higher connected load. Such consumers are generally connected at HT/EHT voltage levels and form a smaller number of consumers with higher average billing per consumer. This approach would allow retail supply companies to develop resources for tackling a bigger consumer base later on and acclimatise to change in regulations.

Since increasing connected load approach is difficult to implement, a hybrid approach could be followed wherein decreasing connected load approach is adopted but with a mandatory requirement of urban/rural consumer mix.

- **Balancing and Settlement** –there are two approaches possible as follows –

S. No.	Approaches for balancing and settlement	
1	Making Advanced Metering compulsory for new retail supply companies	✓
2	Based on consumer category wise sample load curve	✓

Since going forward, advanced metering would be required for better operational management and loss reduction, approach 1 of making Advanced Metering compulsory for new retail supply companies can be adopted. While adopting this approach may burden the new retail supply companies with higher metering costs, this risk would be known to any new retail supplier entering the business and thus can be suitable hedged for. As a transitional mechanism, as decided by the appropriate SERC, till such time advanced metering is not available for all consumers, the balancing and settlement may be carried out using category wise sample load curves. Also as more data is available the process of determining sample load curves would also improve.



*Caveat of phasing based on → Majority number of consumers would have connected load of less than 20 kW, opening competition to a large consumer base at a go. This coupled with USO, might be difficult to implement and become a non starter for reforms. As such a feasible option is to phase out based on decreasing load but with mandatory requirement of urban/rural consumer mix.

Classification of states/utilities

Based on the current levels of Distribution losses (AT&C excluding collection inefficiency loss), availability of power and cost of power purchase, the Indian states/utilities are classified as follows –

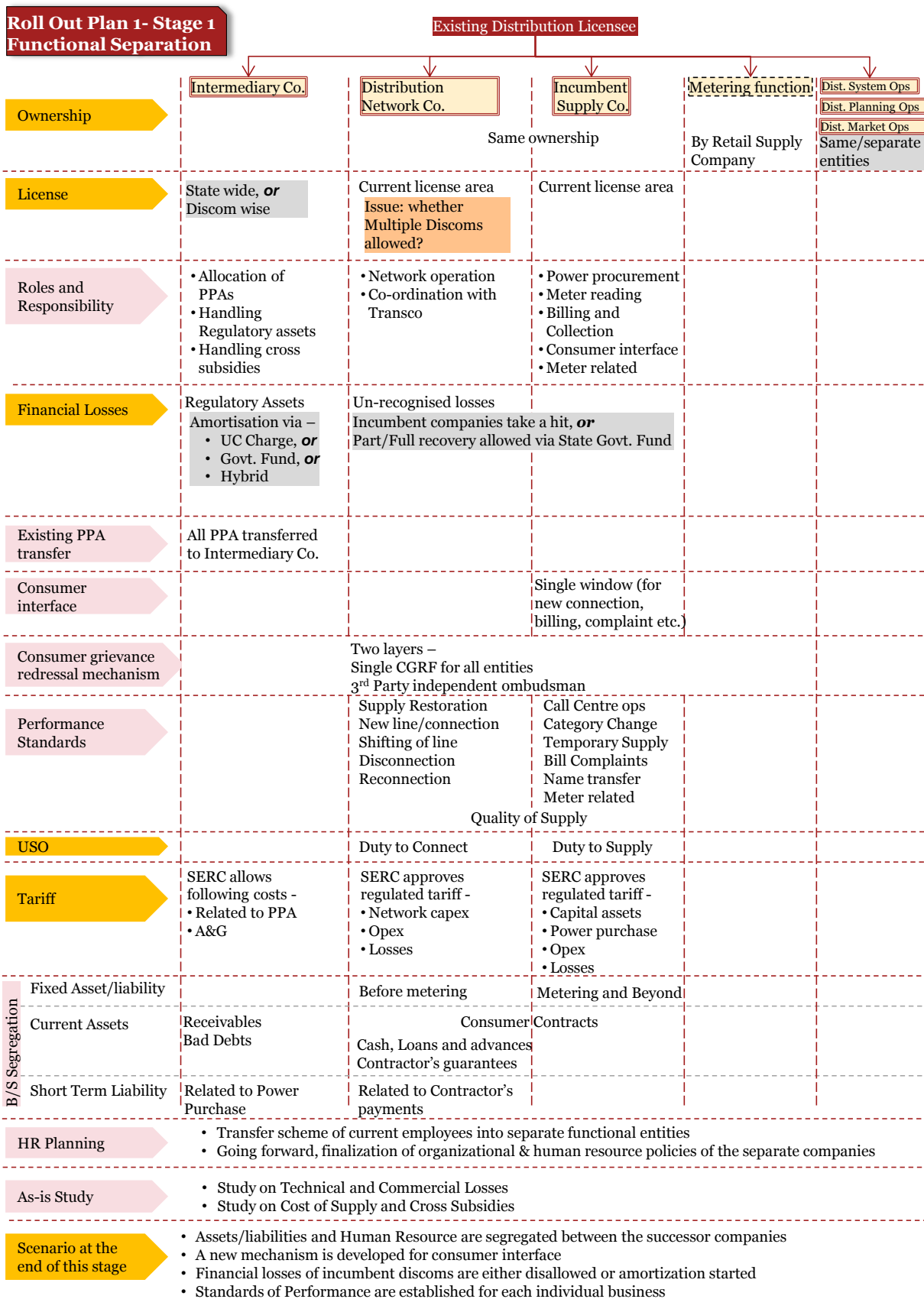
Scenario	States/Utilities
I	Arunachal Pradesh, Assam, Bihar (BSEB, NBPDC, SBPDCL), Chhattisgarh, Jammu & Kashmir, Jharkhand, Karnataka (CHESCOM, GESCOM, HESCOM), Manipur, Meghalaya, Mizoram, Nagaland, Odisha (CESU, NESCO, SESCO, WESCO), Tamil Nadu, Tripura, Uttar Pradesh (DVVN, KESCO, MVVN, Pasch VVN, Poorv VVN), Uttarakhand
II	Gujarat (PGVCL), Haryana (DHBVNL, UHBVNL), Madhya Pradesh (Madhya Kshetra VVCL, Paschim Kshetra VVCL, Purv Kshetra VVCL), Punjab, Rajasthan (AVVNL, JDVVNL, JVVNL), Sikkim, West Bengal
III	Andhra Pradesh (APCPDCL, APEPDCL, APNPDCL, APSPDCL), Karnataka (BESCOM, MESCOM), Maharashtra (MSEDCL), Puducherry
IV	Delhi (BRPL, BYPL, TPDDL), Goa, Gujarat (DGVCL, MGVCL, UGVCL), Himachal Pradesh

The data for classification of these states is attached in appendix 4 of this report.

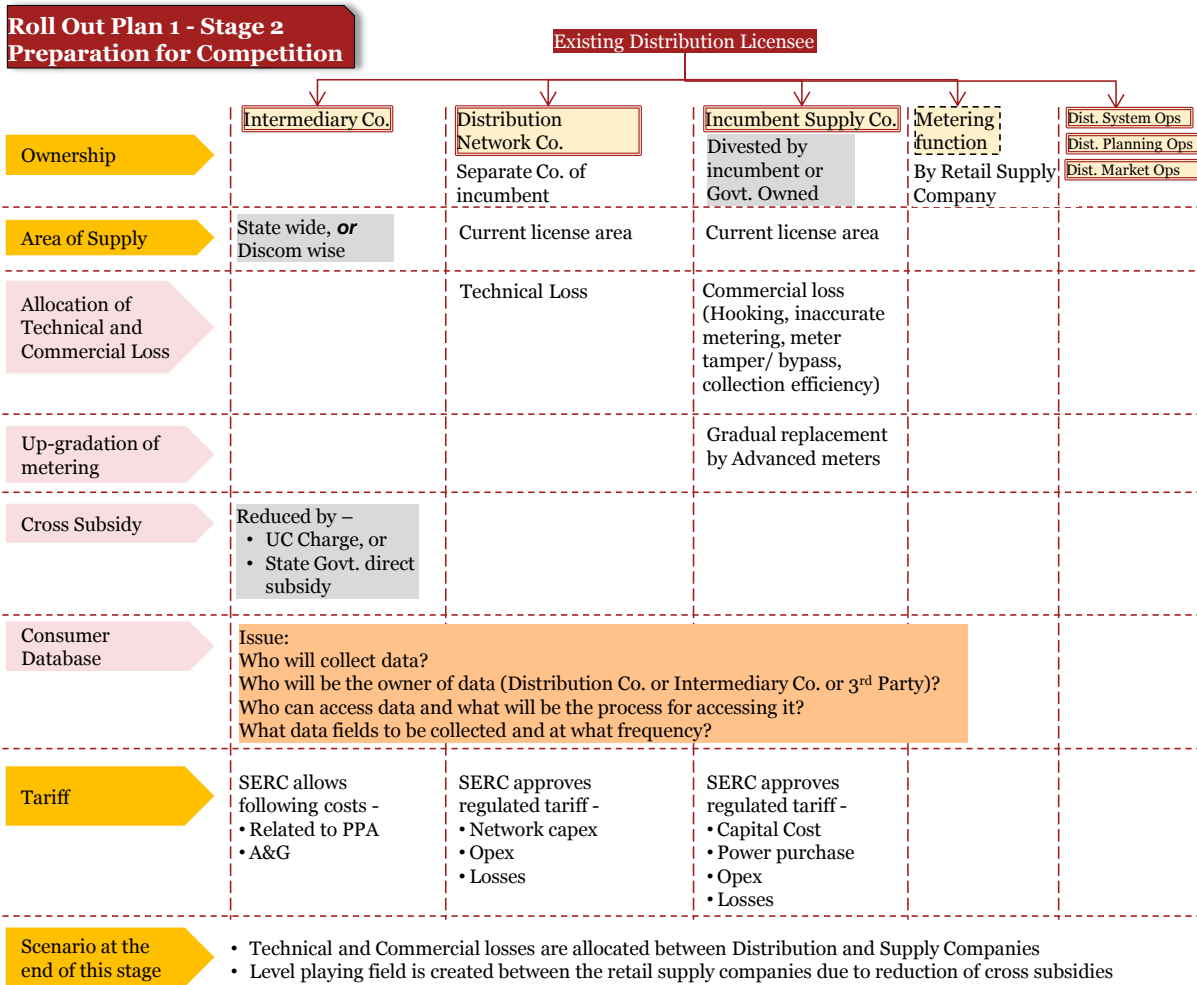
Roll Out Plan for Scenario I (applicable in states with high levels of losses and deficit power | Arunachal Pradesh, Assam, Bihar, Chhattisgarh, Jammu & Kashmir, Jharkhand, Karnataka (CHESCOM, GESCOM, HESCOM), Manipur, Meghalaya, Mizoram, Nagaland, Odisha, Tamil Nadu, Tripura, Uttar Pradesh, Uttarakhand | Driving force for efficiency – Loss Reduction and Power Procurement efficiency)

Roll Out Plan 1	Distribution Business	Incumbent Supply Business (ISL)	New Retail Supply Business (RSL)	SLDC	Intermediary Company (IC)
Cross Subsidy	Universal Charge (UC) Fund A UC fund will cover any revenue gap created due to tariff realignments as per cross subsidies reduction trajectory		or		Direct Government Subsidy The State Government funds the gap between tariffs and cost of supply
Loss Allocation	Technical Losses	Commercial Losses (Hooking, Inaccurate metering, Meter tampering/bypassing, collection inefficiency) Losses to be measured voltage wise			<i>Initial level of losses (technical and commercial) to be estimated & factored in regulated tariff with trajectory for reduction in subsequent years. Loss reduction will be major driver for efficiency in this plan.</i>
Cherry Picking	Will not be an issue as cross subsidy and losses are taken care of as above				
Phasing of competition	Based on Decreasing Connected Load • Initially 100 kW and above • Later 20 kW and above • Further all consumers		or	Based on Increasing Connected Load • Initially 20 kW and below • Later 100 kW and below • Further all consumers	
USO		For all consumers	For consumers open to competition (as per phasing)		
Regulatory Assets & losses	Regulatory Assets & Un-recognised financial losses	<ul style="list-style-type: none"> Amortised using a Universal Charge (UC), or Support from State Government, or Hybrid approach of the two above methods 			
PPA Allocation		<ul style="list-style-type: none"> RSL may approach market first for power procurement For any remaining requirement they go to either wholesale market or enter into new PPAs 			<ul style="list-style-type: none"> All PPAs are transferred to IC IC proportionately allocates power between all suppliers based on consumer mix/load
Metering		Meter Reading, and Other activities (Meter installation/replacement, ownership of metering assets, meter operations and testing)			
Balancing & Settlement			Advanced metering mandatory for RSL	Existing arrangement of energy accounting at Distribution periphery to continue	
POLR		<ul style="list-style-type: none"> On ISL in 1st year After 1st year, as decided by SERC 			
Consumer Interface		1 st time connection, Billing, Complaints and Grievances			
Switching	One year of lock in period after switching, to start with (to be reviewed by the regulator subsequently)				
SOP	<ul style="list-style-type: none"> Separate SOPs for Retail Supply and Distribution Business To be enforced by regulator 				
Tariff Determination	Regulated Tariff	Consumers not open to competition – Regulated			
		Consumers open to competition – Ceiling Tariff			
Consumer Database	Owned and Maintained	Data collected and shared with Distribution business			
Distribution Functions	Network Ops (DNO), Planning Ops (DPO), System Ops (DSO), Market Ops (DMO)				

Stage Wise Flow Chart for Roll Out Plan I (Stage 1)



Stage Wise Flow Chart for Roll Out Plan I (Stage 2)



Stage Wise Flow Chart for Roll Out Plan I (Stage 3)

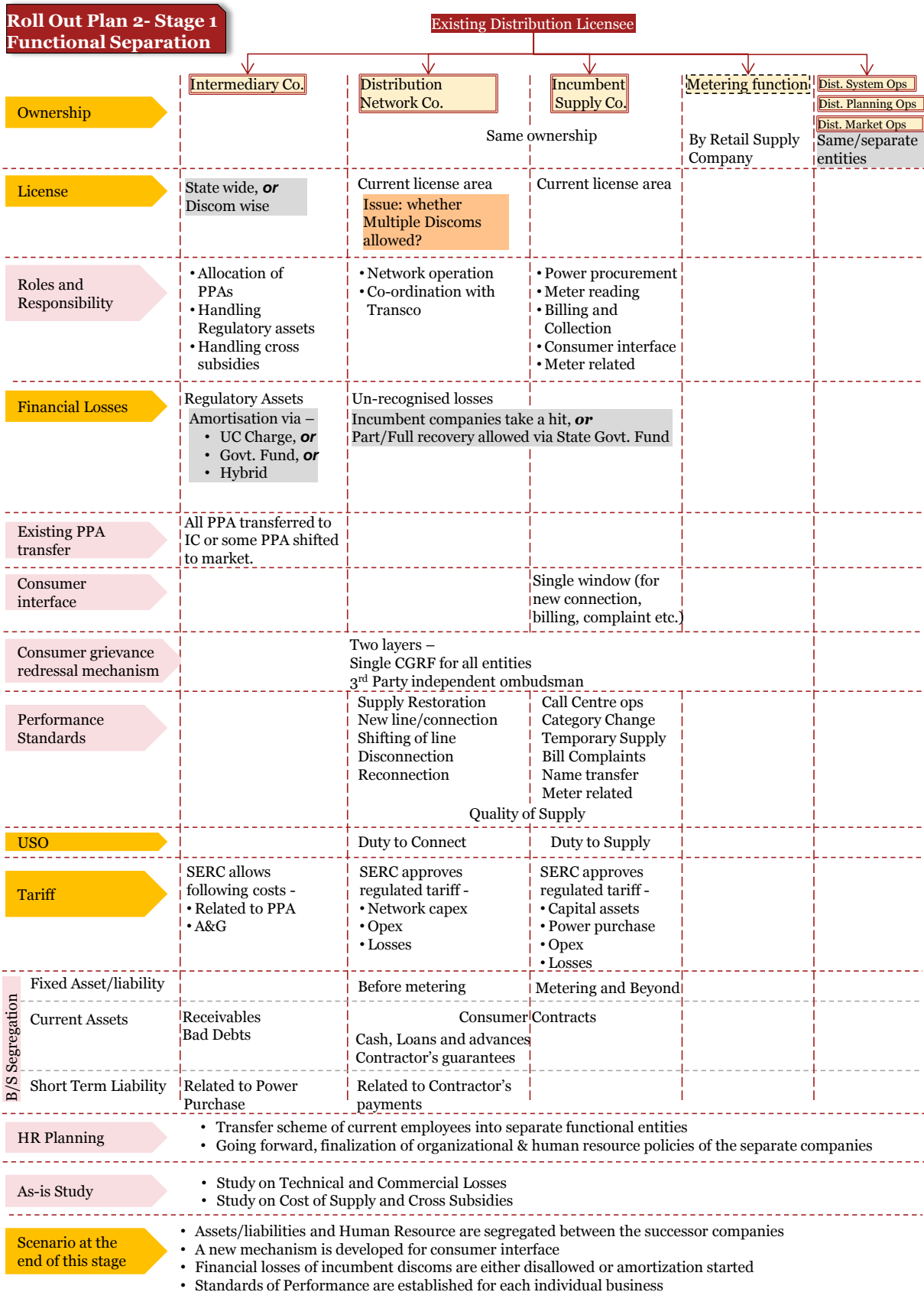
Roll Out Plan 1 - Stage 3 Onset of Competition

	Intermediary Co.	Distribution Co.	Incumbent Supply Co.	Retail Supply Co.	Metering function	Dist. System Ops Dist. Planning Ops Dist. Market Ops
Ownership		Separate Co. of incumbent	Divested by incumbent or Govt. Owned	New entity	By Retail Supply Company	
Area of Supply	State wide, <i>or</i> Discom wise	Current license area	Current license area	Current license area		
Phasing			Based on decreasing connected load: <ul style="list-style-type: none"> Initially 100 kW and above Later 20 kW and above Further all consumers OR based on increasing connected load: <ul style="list-style-type: none"> Initially 20 kW and below Later 100 kW and below Further all consumers 			
Allocation and pricing of existing PPA	All PPAs transferred, Proportionate allocation to all suppliers Allocation of – <ul style="list-style-type: none"> Actual PPAs, <i>or</i> Power (MW) Method - <ul style="list-style-type: none"> Fixed allocation Dynamic allocation Pricing <ul style="list-style-type: none"> Uniform Actual cost DBST 		RSL may go to market for power procurement first and then go to IC for any remaining requirements. ISL accepts power from IC first and then go to market for any remaining requirements.			
Consumer switch Mechanism			One year of lock-in period after switching (to start with)			
Procurement of new PPAs	Demand aggregation		Individual contracts with generators/Wholesale			
Balancing and settlement				Mandatory Advanced Meter <ul style="list-style-type: none"> Payment to generators based on schedule given by supplier Actual consumption of Suppliers measured using AMR, used for deviation settlement. 		
Tariff	SERC allows following costs - <ul style="list-style-type: none"> Related to PPA A&G 	SERC approves regulated tariff - <ul style="list-style-type: none"> Network capex Opex Losses 	SERC approves regulated tariff - <ul style="list-style-type: none"> Capital cost Power purchase Opex Losses Issue: whether differential tariff allowed within consumer category basis certain factors, <i>or</i> not allowed	SERC sets Ceiling tariff applicable on all Supply Co. for consumers open for competition		
POLR			With incumbent Tariff for POLR – <ul style="list-style-type: none"> Tariff of failed Supply Co, <i>or</i> Regulated, <i>or</i> Competitive, <i>or</i> Ceiling, <i>or</i> Actual Cost 			
USO			USO for all	USO for consumer open to competition		

Roll Out Plan for Scenario II (applicable in states with high levels of losses and surplus power | Gujarat (PGVCL), Haryana, Madhya Pradesh, Punjab, Rajasthan, Sikkim, West Bengal | Driving force for efficiency – Loss Reduction and Power Procurement efficiency)

Roll Out Plan 2	Distribution Business	Incumbent Supply Business (ISL)	New Retail Supply Business (RSL)	SLDC	Intermediary Company (IC)
Cross Subsidy	Universal Charge (UC) Fund A UC fund will cover any revenue gap created due to tariff realignments as per cross subsidies reduction trajectory		or		Direct Government Subsidy The State Government funds the gap between tariffs and cost of supply
Loss Allocation	Technical Losses	Commercial Losses (Hooking, Inaccurate metering, Meter tampering/bypassing, collection inefficiency) Losses to be measured voltage wise			<i>Initial level of losses (technical and commercial) to be estimated & factored in regulated tariff with trajectory for reduction in subsequent years. Loss reduction will be major driver for efficiency in this plan.</i>
Cherry Picking	Will not be an issue as cross subsidy and losses are taken care of as above				
Phasing of competition	Based on Decreasing Connected Load		or	Based on Increasing Connected Load	
	<ul style="list-style-type: none"> Initially 100 kW and above Later 20 kW and above Further all consumers 			<ul style="list-style-type: none"> Initially 20 kW and below Later 100 kW and below Further all consumers 	
USO		For all consumers	For consumers open to competition (as per phasing)		
Regulatory Assets & losses	Regulatory Assets & Un-recognised financial losses	<ul style="list-style-type: none"> Amortised using a Universal Charge (UC), or Support from State Government, or Hybrid approach of the two above methods 			
PPA Allocation		<ul style="list-style-type: none"> All suppliers mandatorily accept power from IC first For any remaining requirement they go to either wholesale market or enter into new PPAs 			<ul style="list-style-type: none"> All PPAs are transferred to IC or some PPAs shifted to market IC proportionately allocates power between all suppliers based on consumer mix/load
Metering		Meter Reading, and Other activities (Meter installation/replacement, ownership of metering assets, meter operations and testing)			
Balancing & Settlement			Advanced metering mandatory for RSL	Existing arrangement of energy accounting at Distribution periphery to continue	
		<ul style="list-style-type: none"> Suppliers give schedule to SLDC. Payment to generators based on this Actual consumption of Suppliers measured using Advanced metering. These are then used for deviation settlement. 			
POLR		<ul style="list-style-type: none"> On ISL in 1st year After 1st year, as decided by SERC 			
Consumer Interface		1 st time connection, Billing, Complaints and Grievances			
Switching	One year of lock in period after switching, to start with (to be reviewed by the regulator subsequently)				
SOP	<ul style="list-style-type: none"> Separate SOPs for Retail Supply and Distribution Business To be enforced by regulator 				
Tariff Determination	Regulated Tariff	Consumers not open to competition – Regulated			
		Consumers open to competition – Ceiling Tariff			
Consumer Database	Owned and Maintained	Data collected and shared with Distribution business			
Distribution Functions	Network Ops (DNO) Planning Ops (DPO) System Ops (DSO) Market Ops (DMO)				

Stage Wise Flow Chart for Roll Out Plan II (Stage 1)



Stage Wise Flow Chart for Roll Out Plan II (Stage 2)

Roll Out Plan 2 - Stage 2 Preparation for Competition

	Existing Distribution Licensee				
	Intermediary Co.	Distribution Network Co. Separate Co. of incumbent	Incumbent Supply Co. Divested by incumbent or Govt. Owned	Metering function By Retail Supply Company	Dist. System Ops Dist. Planning Ops Dist. Market Ops
Ownership					
Area of Supply	State wide, <i>or</i> Discom wise	Current license area	Current license area		
Allocation of Technical and Commercial Loss		Technical Loss	Commercial loss (Hooking, inaccurate metering, meter tamper/ bypass, collection efficiency)		
Up-gradation of metering			Gradual replacement by Advanced meters		
Cross Subsidy	Reduced by – • UC Charge, or • State Govt. direct subsidy				
Consumer Database	Issue: Who will collect data? Who will be the owner of data (Distribution Co. or Intermediary Co. or 3 rd Party)? Who can access data and what will be the process for accessing it? What data fields to be collected and at what frequency?				
Tariff	SERC allows following costs - • Related to PPA • A&G	SERC approves regulated tariff - • Network capex • Opex • Losses	SERC approves regulated tariff - • Capital Cost • Power purchase • Opex • Losses		
Scenario at the end of this stage	<ul style="list-style-type: none"> • Technical and Commercial losses are allocated between Distribution and Supply Companies • Level playing field is created between the retail supply companies due to reduction of cross subsidies 				

Stage Wise Flow Chart for Roll Out Plan II (Stage 3)

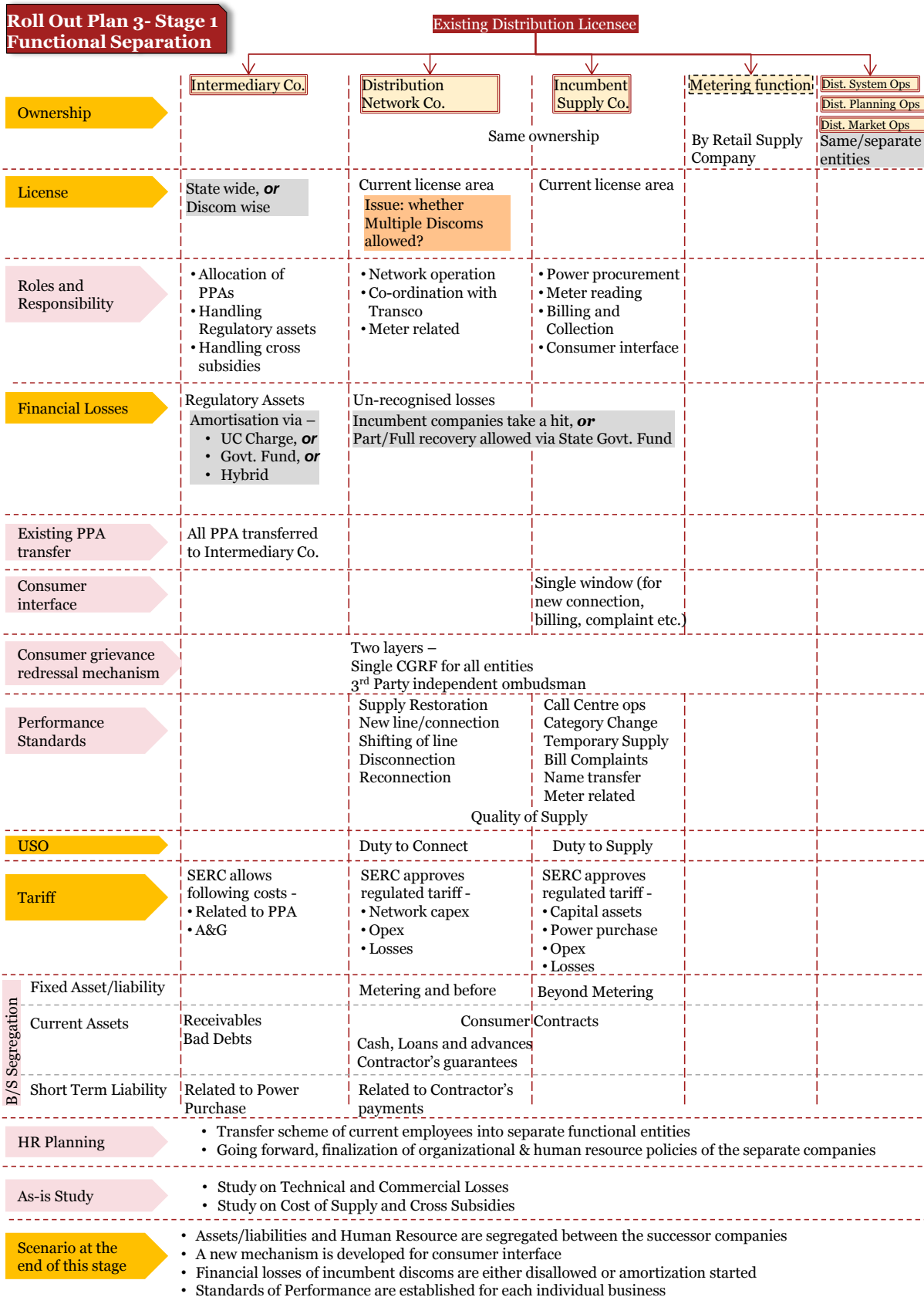
Roll Out Plan 2 - Stage 3 Onset of Competition

	Intermediary Co.	Distribution Co.	Incumbent Supply Co.	Retail Supply Co.	Metering function	Dist. System Ops Dist. Planning Ops Dist. Market Ops
Ownership		Separate Co. of incumbent	Divested by incumbent or Govt. Owned	New entity	By Retail Supply Company	
Area of Supply	State wide, or Discom wise	Current license area	Current license area	Current license area		
Phasing			Based on decreasing connected load: <ul style="list-style-type: none"> Initially 100 kW and above Later 20 kW and above Further all consumers OR based on increasing connected load: <ul style="list-style-type: none"> Initially 20 kW and below Later 100 kW and below Further all consumers 			
Allocation and pricing of existing PPA	Proportionate allocation by IC to all suppliers Allocation of – <ul style="list-style-type: none"> Actual PPAs, or Power (MW) Method - <ul style="list-style-type: none"> Fixed allocation Dynamic allocation Pricing <ul style="list-style-type: none"> Uniform Actual cost DBST 		All suppliers accept power from IC first and then go to market for any remaining requirements.			
Consumer switch Mechanism			One year of lock-in period after switching (to start with)			
Procurement of new PPAs	Demand aggregation		Individual contracts with generators/Wholesale			
Balancing and settlement			Mandatory Advanced Meter <ul style="list-style-type: none"> Payment to generators based on schedule given by supplier Actual consumption of Suppliers measured using AMR, used for deviation settlement. 			
Tariff	SERC allows following costs - <ul style="list-style-type: none"> Related to PPA A&G 	SERC approves regulated tariff - <ul style="list-style-type: none"> Network capex Opex Losses 	SERC approves regulated tariff - <ul style="list-style-type: none"> Capital cost Power purchase Opex Losses Issue: whether differential tariff allowed within consumer category basis certain factors, or not allowed	SERC sets Ceiling tariff applicable on all Supply Co. for consumers open for competition		
POLR			With incumbent Tariff for POLR – <ul style="list-style-type: none"> Tariff of failed Supply Co, or Regulated, or Competitive, or Ceiling, or Actual Cost 			
USO			USO for all	USO for consumer open to competition		

Roll Out Plan for Scenario III (applicable in states with low levels of losses and deficit power | Andhra Pradesh, Karanataka (BESCOM, MESCOM), Maharashtra (MSEDCL), Puducherry | Driving force for efficiency – Power Procurement efficiency)

Roll Out Plan 3	Distribution Business	Incumbent Supply Business (ISL)	New Retail Supply Business (RSL)	SLDC	Intermediary Company (IC)
Cross Subsidy	Universal Charge (UC) Fund A UC fund will cover any revenue gap created due to tariff realignments as per cross subsidies reduction trajectory		or		Direct Government Subsidy The State Government funds the gap between tariffs and cost of supply
Loss Allocation	All other Losses (technical, hooking, meter tampering/bypass)	Collection inefficiency Losses		<i>Initial level of losses (technical and commercial) to be estimated & factored in regulated tariff with trajectory for reduction in subsequent years. Power Procurement efficiency will be driver for efficiency in this plan.</i>	
Cherry Picking	Will not be an issue as cross subsidy and losses are taken care of as above				
Phasing of competition	Based on Decreasing Connected Load • Initially 100 kW and above • Later 20 kW and above • Further all consumers		or	Based on Increasing Connected Load • Initially 20 kW and below • Later 100 kW and below • Further all consumers	
USO		For all consumers	For consumers open to competition (as per phasing)		
Regulatory Assets & losses	Regulatory Assets & Un-recognised financial losses	<ul style="list-style-type: none"> Amortised using a Universal Charge (UC), or Support from State Government, or Hybrid approach of the two above methods 			
PPA Allocation		<ul style="list-style-type: none"> RSL may approach market first for power procurement For any remaining requirement they go to either wholesale market or enter into new PPAs 			<ul style="list-style-type: none"> All PPAs are transferred to IC IC proportionately allocates power between all suppliers based on consumer mix/load
Metering	Other activities (install/replace, ownership of assets, operations & testing)	Meter Reading			
Balancing & Settlement			Advanced metering mandatory for RSL	Existing arrangement of energy accounting at Distribution periphery to continue	
POLR		<ul style="list-style-type: none"> On ISL in 1st year After 1st year, as decided by SERC 			
Consumer Interface		1 st time connection, Billing, Complaints and Grievances			
Switching	One year of lock in period after switching, to start with (to be reviewed by the regulator subsequently)				
SOP	<ul style="list-style-type: none"> Separate SOPs for Retail Supply and Distribution Business To be enforced by regulator 				
Tariff Determination	Regulated Tariff	Consumers not open to competition – Regulated			
		Consumers open to competition – Ceiling Tariff			
Consumer Database	Owned and Maintained	Data collected and shared with Distribution business			
Distribution Functions	Network Ops (DNO), Planning Ops (DPO), System Ops (DSO), Market Ops (DMO)				

Stage Wise Flow Chart for Roll Out Plan III (Stage 1)



Stage Wise Flow Chart for Roll Out Plan III (Stage 2)

Roll Out Plan 3 - Stage 2 Preparation for Competition

	Existing Distribution Licensee				
	Intermediary Co.	Distribution Network Co. Separate Co. of incumbent	Incumbent Supply Co. Divested by incumbent or Govt. Owned	Metering function By Retail Supply Company	Dist. System Ops Dist. Planning Ops Dist. Market Ops
Ownership					
Area of Supply	State wide, <i>or</i> Discom wise	Current license area	Current license area		
Allocation of Technical and Commercial Loss		Other losses (Technical, Hooking, inaccurate metering, meter tamper/ bypass)	Collection efficiency loss		
Up-gradation of metering			Gradual replacement by Advanced meters		
Cross Subsidy	Reduced by – • UC Charge, or • State Govt. direct subsidy				
Consumer Database	Issue: Who will collect data? Who will be the owner of data (Distribution Co. or Intermediary Co. or 3 rd Party)? Who can access data and what will be the process for accessing it? What data fields to be collected and at what frequency?				
Tariff	SERC allows following costs - • Related to PPA • A&G	SERC approves regulated tariff - • Network capex • Opex • Losses	SERC approves regulated tariff - • Capital Cost • Power purchase • Opex • Losses		
Scenario at the end of this stage	<ul style="list-style-type: none"> • Technical and Commercial losses are allocated between Distribution and Supply Companies • Level playing field is created between the retail supply companies due to reduction of cross subsidies 				

Stage Wise Flow Chart for Roll Out Plan III (Stage 3)

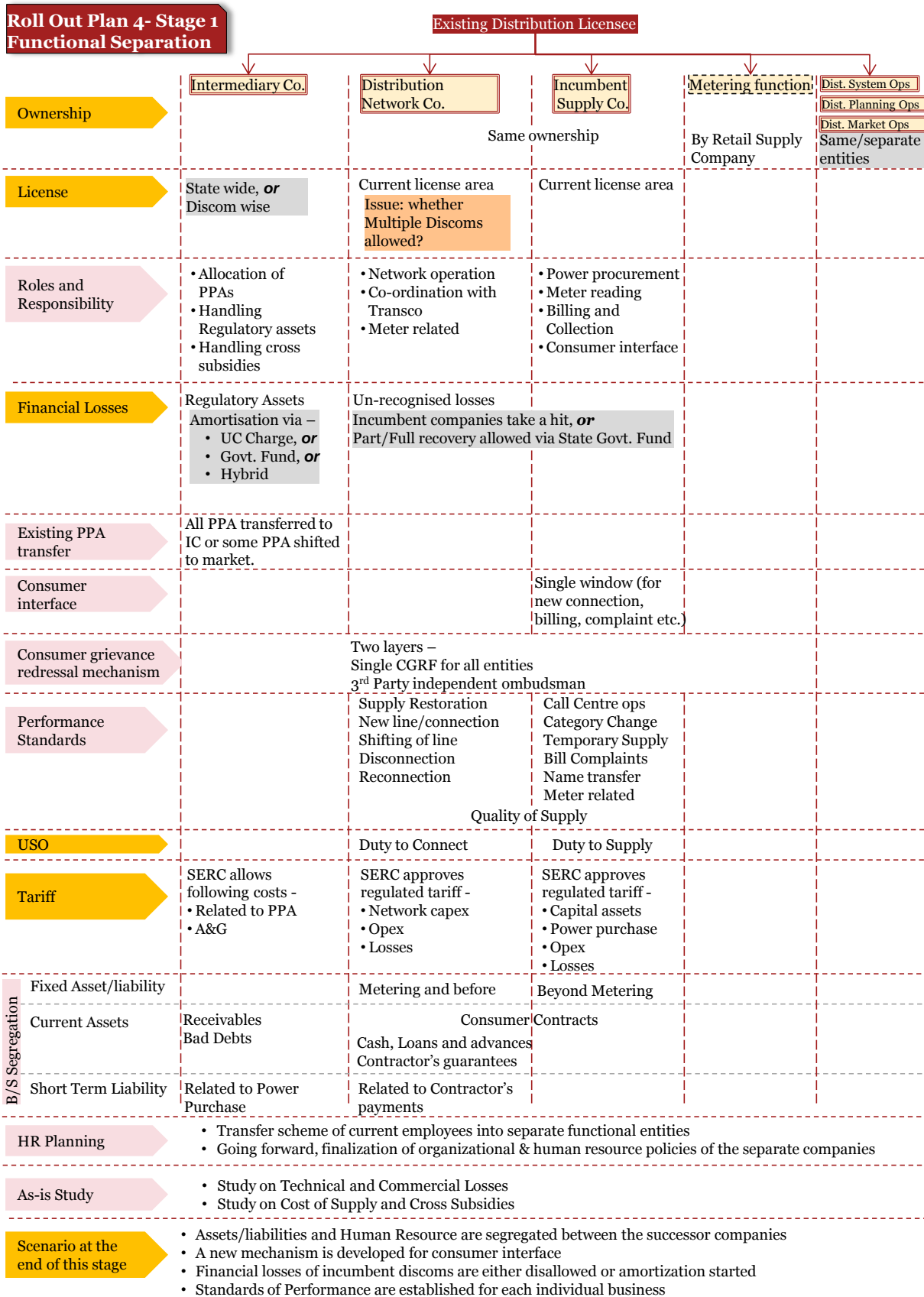
Roll Out Plan 3 - Stage 3 Onset of Competition

	Intermediary Co.	Distribution Co.	Incumbent Supply Co.	Retail Supply Co.	Metering function	Dist. System Ops	Dist. Planning Ops	Dist. Market Ops
Ownership		Separate Co. of incumbent	Divested by incumbent or Govt. Owned	New entity	By Retail Supply Company			
Area of Supply	State wide, or Discom wise	Current license area	Current license area	Current license area				
Phasing			Based on decreasing connected load: <ul style="list-style-type: none"> Initially 100 kW and above Later 20 kW and above Further all consumers OR based on increasing connected load: <ul style="list-style-type: none"> Initially 20 kW and below Later 100 kW and below Further all consumers 					
Allocation and pricing of existing PPA	All PPAs transferred, Proportionate allocation to all suppliers Allocation of – <ul style="list-style-type: none"> Actual PPAs, or Power (MW) Method - <ul style="list-style-type: none"> Fixed allocation Dynamic allocation Pricing <ul style="list-style-type: none"> Uniform Actual cost DBST 		RSL may go to market for power procurement first and then go to IC for any remaining requirements. ISL accepts power from IC first and then go to market for any remaining requirements.					
Consumer switch Mechanism			One year of lock-in period after switching (to start with)					
Procurement of new PPAs	Demand aggregation		Individual contracts with generators/Wholesale					
Balancing and settlement				Mandatory Advanced Meter <ul style="list-style-type: none"> Payment to generators based on schedule given by supplier Actual consumption of Suppliers measured using AMR, used for deviation settlement. 				
Tariff	SERC allows following costs - <ul style="list-style-type: none"> Related to PPA A&G 	SERC approves regulated tariff - <ul style="list-style-type: none"> Network capex Opex Losses 	SERC approves regulated tariff - <ul style="list-style-type: none"> Capital cost Power purchase Opex Losses 	SERC sets Ceiling tariff applicable on all Supply Co. for consumers open for competition Issue: whether differential tariff allowed within consumer category basis certain factors, or not allowed				
POLR			With incumbent Tariff for POLR – <ul style="list-style-type: none"> Tariff of failed Supply Co, or Regulated, or Competitive, or Ceiling, or Actual Cost 					
USO			USO for all	USO for consumer open to competition				

Roll Out Plan for Scenario IV (applicable in states with low levels of losses and surplus power | Delhi (BRPL, BYPL, TPDDL), Goa, Gujarat (DGVCL, MGVCL, UGVCL), Himachal Pradesh | Driving force for efficiency –Power Procurement efficiency)

Roll Out Plan 4	Distribution Business	Incumbent Supply Business (ISL)	New Retail Supply Business (RSL)	SLDC	Intermediary Company (IC)
Cross Subsidy	Universal Charge (UC) Fund A UC fund will cover any revenue gap created due to tariff realignments as per cross subsidies reduction trajectory		or		Direct Government Subsidy The State Government funds the gap between tariffs and cost of supply
Loss Allocation	All other Losses (technical, hooking, meter tampering/bypass)	Collection inefficiency Losses			<i>Initial level of losses (technical and commercial) to be estimated & factored in regulated tariff with trajectory for reduction in subsequent years. Power Procurement efficiency will be driver for efficiency in this plan.</i>
Cherry Picking	Will not be an issue as cross subsidy and losses are taken care of as above				
Phasing of competition	Based on Decreasing Connected Load • Initially 100 kW and above • Later 20 kW and above • Further all consumers		or	Based on Increasing Connected Load • Initially 20 kW and below • Later 100 kW and below • Further all consumers	
USO		For all consumers	For consumers open to competition (as per phasing)		
Regulatory Assets & losses	Regulatory Assets & Un-recognised financial losses	<ul style="list-style-type: none"> Amortised using a Universal Charge (UC), or Support from State Government, or Hybrid approach of the two above methods 			
PPA Allocation		<ul style="list-style-type: none"> All suppliers mandatorily accept power from IC first For any remaining requirement they go to either wholesale market or enter into new PPAs 			<ul style="list-style-type: none"> All PPAs are transferred to IC or some PPAs shifted to market IC proportionately allocates power between all suppliers based on consumer mix/load
Metering	Other activities (install/replace, ownership of assets, operations & testing)	Meter Reading			
Balancing & Settlement			Advanced metering mandatory for RSL	Existing arrangement of energy accounting at Distribution periphery to continue	
POLR		<ul style="list-style-type: none"> On ISL in 1st year After 1st year, as decided by SERC 			
Consumer Interface		1 st time connection, Billing, Complaints and Grievances			
Switching	One year of lock in period after switching, to start with (to be reviewed by the regulator subsequently)				
SOP	<ul style="list-style-type: none"> Separate SOPs for Retail Supply and Distribution Business To be enforced by regulator 				
Tariff Determination	Regulated Tariff	Consumers not open to competition – Regulated			
		Consumers open to competition – Ceiling Tariff			
Consumer Database	Owned and Maintained	Data collected and shared with Distribution business			
Distribution Functions	Network Ops (DNO) Planning Ops (DPO) System Ops (DSO) Market Ops (DMO)				

Stage Wise Flow Chart for Roll Out Plan IV (Stage 1)



Stage Wise Flow Chart for Roll Out Plan IV (Stage 2)

Roll Out Plan 4 - Stage 2 Preparation for Competition

	Existing Distribution Licensee				
	Intermediary Co.	Distribution Network Co. Separate Co. of incumbent	Incumbent Supply Co. Divested by incumbent or Govt. Owned	Metering function By Retail Supply Company	Dist. System Ops Dist. Planning Ops Dist. Market Ops
Ownership					
Area of Supply	State wide, or Discom wise	Current license area	Current license area		
Allocation of Technical and Commercial Loss		Other losses (Technical, Hooking, inaccurate metering, meter tamper/ bypass)	Collection efficiency Loss		
Up-gradation of metering			Gradual replacement by Advanced meters		
Cross Subsidy	Reduced by – • UC Charge, or • State Govt. direct subsidy				
Consumer Database	Issue: Who will collect data? Who will be the owner of data (Distribution Co. or Intermediary Co. or 3 rd Party)? Who can access data and what will be the process for accessing it? What data fields to be collected and at what frequency?				
Tariff	SERC allows following costs - • Related to PPA • A&G	SERC approves regulated tariff - • Network capex • Opex • Losses	SERC approves regulated tariff - • Capital Cost • Power purchase • Opex • Losses		
Scenario at the end of this stage	<ul style="list-style-type: none"> • Technical and Commercial losses are allocated between Distribution and Supply Companies • Level playing field is created between the retail supply companies due to reduction of cross subsidies 				

Stage Wise Flow Chart for Roll Out Plan IV (Stage 3)

Roll Out Plan 4 - Stage 3 Onset of Competition

	Intermediary Co.	Distribution Co.	Incumbent Supply Co.	Retail Supply Co.	Metering function	Dist. System Ops Dist. Planning Ops Dist. Market Ops
Ownership		Separate Co. of incumbent	Divested by incumbent or Govt. Owned	New entity	By Retail Supply Company	
Area of Supply	State wide, <i>or</i> Discom wise	Current license area	Current license area	Current license area		
Phasing			Based on decreasing connected load: <ul style="list-style-type: none"> Initially 100 kW and above Later 20 kW and above Further all consumers OR based on increasing connected load: <ul style="list-style-type: none"> Initially 20 kW and below Later 100 kW and below Further all consumers 			
Allocation and pricing of existing PPA	Proportionate allocation by IC to all suppliers Allocation of – <ul style="list-style-type: none"> Actual PPAs, <i>or</i> Power (MW) Method - <ul style="list-style-type: none"> Fixed allocation Dynamic allocation Pricing <ul style="list-style-type: none"> Uniform Actual cost DBST 		All suppliers accept power from IC first and then go to market for any remaining requirements.			
Consumer switch Mechanism			One year of lock-in period after switching (to start with)			
Procurement of new PPAs	Demand aggregation		Individual contracts with generators/Wholesale			
Balancing and settlement			Mandatory Advanced Meter <ul style="list-style-type: none"> Payment to generators based on schedule given by supplier Actual consumption of Suppliers measured using AMR, used for deviation settlement. 			
Tariff	SERC allows following costs - <ul style="list-style-type: none"> Related to PPA A&G 	SERC approves regulated tariff - <ul style="list-style-type: none"> Network capex Opex Losses 	SERC approves regulated tariff - <ul style="list-style-type: none"> Capital cost Power purchase Opex Losses Issue: whether differential tariff allowed within consumer category basis certain factors, <i>or</i> not allowed	SERC sets Ceiling tariff applicable on all Supply Co. for consumers open for competition		
POLR			With incumbent Tariff for POLR – <ul style="list-style-type: none"> Tariff of failed Supply Co, <i>or</i> Regulated, <i>or</i> Competitive, <i>or</i> Ceiling, <i>or</i> Actual Cost 			
USO			USO for all	USO for consumer open to competition		

Impact of retail supply competition

Achieving objectives of retail supply competition

As discussed in the section ‘Introduction’ under the heading ‘Objectives of introducing retail supply competition’ of this report, there are several objectives which can be achieved by implementing the various roll out plans of retail supply competition. Each roll out plan can become the driving factor for achieving one or more of these objectives, as follows -

Objective	How can Retail Supply Competition help achieve this objective?	Roll out plans which help in achieving this objective
<i>Improvement in efficiency and loss reduction</i>	The licensees can focus on their respective responsibilities. Distribution company would focus entirely on technical and operational efficiency, while the retail supplier would focus entirely on power procurement and consumer interface	Roll Out Plan 1 and 2
<i>To give choice to consumers</i>	Choice allows consumers to differentiate between suppliers on the parameters like quality of supply, supply tariffs and customer service. This in turn puts pressure on Supply companies to improve their services.	All Roll Out Plans
<i>Improved access and availability of power</i>	Owing to focused investments of distribution in network up gradation and increased efficiencies in power procurement by Retail Supply Competition, in the long run power availability to consumers will improve.	All Roll Out Plans
<i>Efficient power procurement</i>	In order to capture a greater market share in their supply area, the retail supply companies would work towards improving efficiency in power procurement.	Roll Out Plan 2 and 4

From the above table it can be observed that irrespective of the roll out plan adopted, the introduction of retail supply competition would impact consumers by helping in achieving objectives of ‘giving choice to consumers’ and ‘improving access and availability of power’. Further the roll out plan adopted can drive the following objectives –

- **Improvement in efficiency and loss reduction** – this can be driven through roll out plans 1, and 2 as the current scenario in these roll out plans would include high level of losses which in turn give opportunity to new retail supply companies to bring in efficiencies.
- **Efficient power procurement** – this can be driven through roll out plans 2 and 4 wherein the availability of power is surplus. In such a scenario new retail supply companies are allowed to procure power from market first rather than the Intermediary Company and certain/partial PPAs are shifted to wholesale market.

Benefits that can be derived out of retail supply competition by end consumers

Earlier in this section we discussed the various objectives that retail supply competition could drive. In this section we discuss the various benefits that end consumers or other market participants can derive out of retail supply competition, which are as follows –

- **Reduction in tariffs:** as more suppliers enter into business, competition among them would put downward pressure on end consumer tariffs.

- **Innovative products for end consumers:** as the competition in the market increases, suppliers could come up with innovative products based on concepts of time based tariffs or easy payment plans in order to acquire a larger market share. The new suppliers would look to offer an array of products that match the varying consumer needs.

Dual fuel deal – United Kingdom

Dual fuel energy tariff is an innovative product offered in UK, wherein a consumer gets both gas and electricity from the same energy supplier. The consumer therefore has only one bill and one payment to think about. Suppliers offered discounts to consumers on taking up this service.

- **Reducing market imperfections:** the new retail suppliers or other market participants would enter the market segments where incumbent supplier used to make extra normal profits and put a downward pressure on costs as well as tariffs.
- **Increased use of renewable and clean sources of energy:** retail supply companies in order to extract maximum profit margins out of the competitive tariffs would want to reduce their costs. Therefore suppliers would want to purchase power increasingly from either cheaper renewable sources or more efficient and cleaner generation plants in order to save on their power purchase costs.
- **Efficiency in services:** as competition in the market increases, the retail suppliers would not only compete with each other on tariffs but also service related issues like response time to complaints, guarantee of 24x7 power supply (or for say certain hours a day, depending upon the power availability scenario).

Barriers which may prevent benefits of retail competition from reaching end consumers

- **Little scope for differentiation** – electricity being a homogenous product, the differentiation that a retail supplier can bring is not in the product itself but in its packaging and pricing. However retailing activities represent a very small part of the electricity tariffs, therefore leaving limited space of creating value additions for customers.
- **Network congestion** – the service of retail suppliers is limited by the physical capacity of the network. Therefore even if a retail supply is able to procure power at cheaper rates, the physical flow of the electricity could be affected by deficient network or network congestion at the distribution company's end.
- **Switching costs** – there are three types of costs that a consumer (or a supplier on consumer behalf) might have to bear in order to shift retail supplier, as follows:
 - **Search Costs** – identifying the best possible retail supplier and comparing their offers.
 - **Learning costs** – the efforts in understanding the business methods of the new retail supplier, such as how to make bill payments or how to contact customer service. A customer may have developed a long relationship with its incumbent retail supplier's support staff.
 - **Transaction cost** – cost and efforts involved in ending the previous contracts with the incumbent supplier and forming new ones with the new retail supplier.

The new retail supplier would have to offer services with benefits that outweigh these costs.

Indicators of a successful retail supply competition

Earlier in this section we discussed the various objectives that we expect to achieve with the implementation of retail supply competition. However in order to objectively measure the successful implementation of retail supply competition, the following parameters can be used as indicators -

- Number of retail suppliers operating in a license area

-
- Percentage share of consumer switching retail supplier
 - Improvement in efficiency parameters like losses, availability of power etc.
 - Total amount of switching costs (an indirect indicator of barriers to consumer switch)

International Experience

Internationally, the competitive retail supply model has been implemented in a full-fledged manner in the United Kingdom, New Zealand, Norway, Finland, Spain, certain States of Australia and United States of America. It is currently under various stages of implementation in other countries such as the Philippines. Of these, the United Kingdom and the Australian state of Victoria are widely regarded as successful models of implementation where introducing competition in retail supply.

Three international experiences, viz. UK, Australia and Philippines are chosen as case studies for a detailed study as the energy reforms process in these countries involved separate distribution and supply functions as envisaged in the Indian context. In this section we discuss the relevant portions from the international experience of these countries.

United Kingdom

Industry structure before introduction of retail supply competition

After World War II and before the introduction of privatisation reforms in 1989, the power sector of United Kingdom, looked as follows -

- Central Electricity Generating Board (CEGB) owned and operated the transmission system and the generating stations in England and Wales
- 14 area boards – 12 in England and Wales and 2 in the south of Scotland, each constituted as a separate public corporation, were responsible for the distribution and retail of electricity in its own region.
- The Electricity Council exercised a co-ordinating role on matters of industry-wide concern.

The Electricity Act 1989 paved the way for restructuring and privatisation of the electricity industry in Great Britain. The Act had provisions for privatization, introduction of competitive markets, and a system of independent regulation. Some of the major changes in the sector were -

- On 31 March 1990, all coal-fired and oil-fired generating plants in England and Wales that had previously been under the control of the state-owned Central Electricity Generating Board (CEGB) were allocated ('vested') to two new companies, National Power and Powergen.
- The vertically integrated CEGB was split into 3 generating companies (National Power, Powergen and Nuclear Electric) and one transmission company (National Grid Company i.e. NGC).
- Regional area boards were replaced with 12 regional electricity companies (RECs) and the local distribution systems were transferred to the RECs. In due course of time, the government also sold off all 12 RECs.
- Established the electricity pool as the wholesale market mechanism through which electricity was traded in England and Wales.
- Abolished the Electricity Council and created a system of independent regulation, headed by the director general of electricity supply, covering England, Wales and Scotland, and supported by a regulatory office, the Office of Electricity Regulation (Offer), to regulate the newly privatised electricity industry.

Privatisation

The RECs were privatised in 1990 by public floatation on stock market. This was followed, on 12 March 1991, by the floatation of National Power and Powergen, with 60% of the shares of each sold. The government sold its remaining 40% of the shares of Powergen and National Power in March 1995, retaining a special share. On 18 June 1991, Scottish Hydro-Electric and Scottish Power were floated. At this stage, the two nuclear companies, Nuclear Electric and Scottish Nuclear, remained in public ownership.

Introduction of retail supply competition

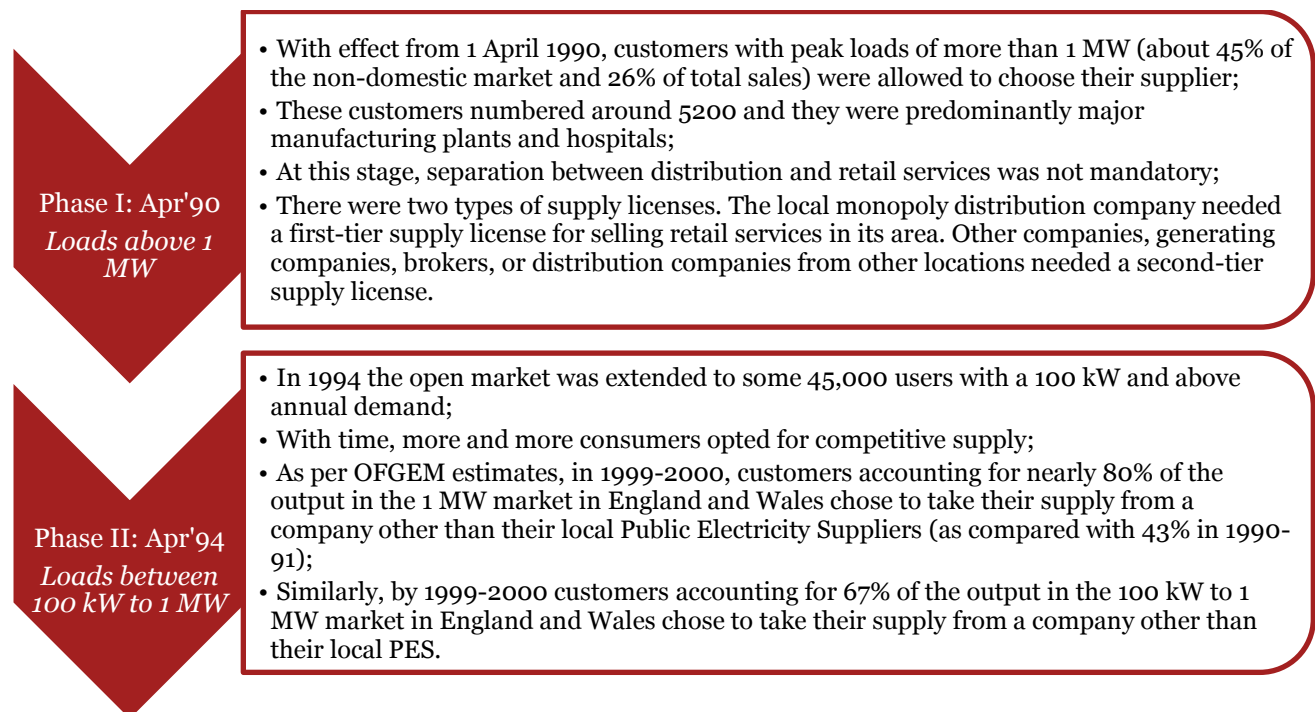
The supply market was opened up to competition in three phases, starting from April 1990 and culminating in May 1999. The retail side of the market was divided into “franchise” and “non-franchise” customers. The franchise market consisted of customers with load of 100 kW or less. Non-franchise market consisted of the remaining consumers with larger loads. Two types of suppliers existed –

- First Tier Suppliers – Each of the REC in its respective supply area was known as the first tier supplier
- Second Tier Suppliers – RECs operating outside their designated supply areas, generators and new independent energy companies were known as second tier supply companies

Till 1998, the first tier suppliers i.e. RECs in their respective supply areas, had exclusive right to supply electricity to franchise consumers. Non-franchise customers were given the option of choosing their supplier from among the first tier supplier or second tier suppliers.

Phasing of retail supply competition

As discussed in the previous section, the supply market was divided into franchise and non-franchise consumers and these were then gradually opened up for retail supply competition in three phases as follows –



Phase III: Sept'98
to Mar'04
All loads

- Opening up of the domestic market (below 100 kW) to competition also met with success;
- By September 2001, 38% of domestic electricity customers had switched supplier one or more times since the introduction of competition;
- However, after an initial increase in the numbers of licensed electricity suppliers operating in the electricity supply market, there was an increase in merger and acquisition activity suggesting a trend toward consolidation of the electricity supply market, as falling prices and relentless competition spurred on companies to seek opportunities for consolidation to become more competitive.

Functional separation of distribution business and reorganisation of supply areas

The Regional Electricity Companies (RECs) ran regional distribution networks as well as supplied electricity directly to consumers. The industry regulator was concerned that companies were using their effective regional monopolies on distribution to subsidise their retail activities. In 1997 the companies were required to effect a complete separation their distribution and retail businesses although they could still continue to own both operations.

The Utilities Act 2000 abolished the existing distribution/retail licences, and introduced a Great Britain-wide licence, allowing all suppliers to supply customers nationwide. The Utilities Act also made provision for the separation of supply and distribution activities, requiring the separation of the supply and distribution businesses of the former Public Electricity Suppliers (PES). Any company holding an electricity supply licence could now sell electricity, and all customers became free to choose their own supplier.

Metering Services

Competition in metering was introduced for larger customers in the electricity market in 1994. Up until that time all metering work had been performed by regional or national monopolies. As independent Meter Operators entered the market the original metering businesses were separated from their corporate companies. New trading arrangements were introduced to the electricity and gas markets to enable competition in energy supply to develop. The business interests of Meter Operators were found to be different to those of other parties to the trading arrangements.

As per the current industry structure, metering is the responsibility of the supplier. The metering activity is further subdivided into two 3rd party activities -

- **MAP (Meter Asset Provider)** – procurement, asset management and tracking, fault triage, warranty claim management
- **MOP (Meter Operator)** – Installation and maintenance of meters

Both of them are appointed by Retail Supply Company. MAP and MOP can be handled by same agency as well.

In April 2000, agent competition was introduced to the electricity market, allowing suppliers to choose who provides them with metering services. Suppliers are now able to contract with any accredited metering service provider.

Issue of metering in case of consumer switching

A Meter Point Administration Number (MPAN) is a 21-digit reference used in Great Britain to uniquely identify electricity supply points such as individual domestic residences. The system was introduced in 1998 in order to provide a competitive environment for the electricity companies, and allow consumers to switch their supplier

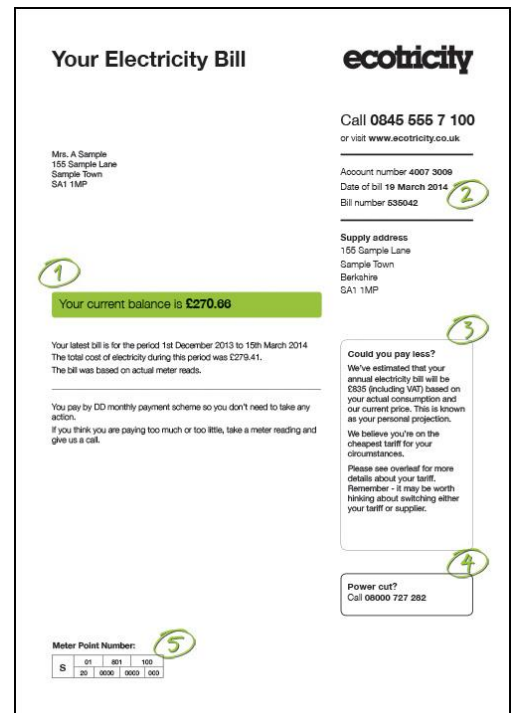
easily as well as simplify administration. Although the name suggests that a MPAN refers to a particular meter, a MPAN can have several meters associated with it, or indeed none where it is an unmetered supply. A supply receiving power from the network operator (DNO) has an Import MPAN, while generation and micro-generation projects feeding back into the DNO network are given Export MPANs.

Consumer interface and consumer grievance redressal

In the current sector scenario of United Kingdom, the Distribution business and the retail supply business have separate Consumer Interface to deal with consumer complaints or queries or requests. If consumer has a complaint or enquiry about a supplier or network operator, he/she should -

- Contact that company directly in the first instance
- If the customer is still dissatisfied from the solution to complaint, then consumer can go to Ombudsmen

The Supply Company educates consumers on who to call in case of Power Cuts (Network related issues). A contact number is mentioned on the consumer bills which guides consumer regarding where to call in case of power cuts. This is in addition to the customer care number of Retail Supply Company. Still in case the consumer calls the Supply Company for network related issue, the consumer will be directed to right interface based on their postal code.



Independent Consumer Grievance Redressal mechanism

Ombudsman Services: Energy is the free independent redress scheme set up to investigate complaints from domestic and micro business consumers that the energy company cannot resolve (after eight weeks or deadlock).

Powers of Ombudsman: Ombudsman can require the company to correct the problem, apologise, explain what happened, and make a financial award. Its decisions are binding on the energy company but not the consumer.

Funding of Ombudsman: Case fee is charged to company. Its payment is not dependent on outcome. The service is free for consumers. This means that the more complaints companies resolve in-house, the less they pay; this provides an incentive for them to improve.

Independence of Ombudsman: Ombudsman Services is governed by a board of directors, of which non-executive directors are the majority. Board ensures the independence of the Ombudsman service and has responsibility of appointing the chief ombudsman.

Procurement of Power

In 1990, a **Wholesale electricity trading arrangements (Pool)** was established. The Pool worked on the basis of bids from the generating companies setting the price at which they would sell electricity in 48 half-hourly blocks over a 24-hour period. 2 problems emerged in Pool -

- The generating companies could restrict supply and therefore push up the price of wholesale electricity. This was certainly a main worry in the opening years when National Power and Powergen were by far the dominant players in the market.
- Extensive use of contract for differences. These were hedging contracts designed to limit the exposure of participants in Pool to price fluctuations. This effectively meant that the generators and regional electricity supply companies, could sidestep the Pool

In 2001, **New Electricity Trading Arrangements (NETA)** was established. It would operate like other commodity markets whilst making provision for the electricity system to be kept in physical balance at all times to maintain security and quality of supplies. The main differences between NETA and the electricity pool were –

- **Self-dispatch** – each generator is responsible for determining the level of output from each of its units as opposed to the National Grid Company (NGC) scheduling on behalf of all generators as under the pool
- **Paid as bid** – all trades are valued at the bid price for that trade rather than at the bid price for the most expensive trade for a given time period;
- **Firmness of markets** – any difference between physical consumption or production and contracted positions at 3.5 hours is cashed out through the balancing mechanism at a penal rate (the pool was non-firm, resulting in reduced incentives to tailor contract positions to actual patterns of consumption and production and hence reduced liquidity in contract markets);
- **Ex-post price** – the cash-out price is determined after the event, as opposed to in the pool where the cash-out price was known to a high degree of certainty at the day ahead stage;
- **Trading closer to the event** – under NETA, trading continues up to 3.5 hours ahead of real time, allowing market participants greater opportunity to tailor their contracted position to match their physical position (under the pool, offers were made between 19 and 43 hours ahead of real time).

NETA was expanded into the **British Electricity Transmission and Trading Arrangements (BETTA)** in 2005, bringing Scotland into the market.

Tariff determination

The purpose of price controls on tariffs is to prevent utilities from exploiting consumers and stimulate some aspects of competitive market. It follows, therefore, that once competition has developed and customers are free to choose from whom they purchase, these price controls are no longer needed. Competition between suppliers for sales will put downward pressure on prices and create the necessary incentive for suppliers to operate efficiently.

Till 1998, before opening competition to consumer with load 100 kW or less

Until April 1998, the former REC's supply charges were regulated by a RPI-X+Y revenue yield control. The Y factor, which had five components, enabled each REC to pass through to customer's costs already regulated by another price control, that is:

- transmission costs (excluding exit charges for transferring electricity from the grid to the REC's own distribution network)
- distribution costs
- electricity purchase costs
- the Fossil Fuel Levy
- administration payments to the pool

From 1998 to 2000

The next supply price restraint ran from April 1998 for two years during the transition to competition in the supply market. The price controls applied only to the PESs. Second tier suppliers were not subject to any price restraint. The controls covered domestic and small non-domestic customers, known as designated customers, and took the form of maximum price restraints rather than the cost pass-through controls that applied prior to this.

From 2000 to 2002

The next electricity retail price controls were introduced in April 2000 for two years. These price controls on the ex-PES suppliers took the form of a restriction on the weighted average unit price they could charge to standard domestic customers and the weighted average unit price they could charge to domestic economy customers within their supply service areas.

2002 onwards

From 2002 onwards, Ofgem replaced price controls with the use of powers of investigation and enforcement under competition law. This also resulted in the removal of the two remaining prescribed standards of performance in electricity supply, and the lifting of the requirement on ex-PES suppliers to submit regulatory accounts to Ofgem.

Energy Supply Probe by Ofgem

During the period 2004-2007, concerns were expressed about the operation of Great Britain's gas and electricity retail supply markets for domestic and small business consumers. Unprecedented increase in world fuel prices caused increase in wholesale and retail gas and electricity prices. A typical household's energy bills had more than doubled since early 2004 and many households were struggling to pay their bills. The numbers of consumers in debt to their energy suppliers, average debt levels and disconnection rates were rising.

In view of this, in 2008 Ofgem (Office of gas and electricity markets) launched the 'Energy Supply Probe' investigation into the electricity and gas supply markets for households and small businesses. The regulator found that although there was no evidence of cartelisation in the market and that the retail price rises could be justified by wholesale costs, the market was not working in the best interests of consumers. Some of the positives and negatives of the energy market identified by the probe were as follows –

	Positives	Negatives
Customer Engagement	<ul style="list-style-type: none">• Easy switching process: High rates of switching (18%) as compared to other European countries.	<ul style="list-style-type: none">• Consumer switching was based on partial information: Switching did not put pressure on suppliers to reduce prices. As many as 1/3rd of the consumers that switched may not have received tariff reduction.
Supply pricing	<ul style="list-style-type: none">• Innovative products: Fixed or variable prices, green energy deals, social tariffs, energy service packages and a wide range of incentive/reward deals introduced by suppliers.• No evidences of cartelisation found.	<ul style="list-style-type: none">• Differential pricing: Instances of Differential Pricing were observed, wherein certain consumers were charged 6% higher tariff on average than other consumers. Suppliers were charging more to their existing consumers in order to offer higher discounts to acquire new customers.• Lag between wholesale and retail electricity tariffs: evidence was found of time lag between changes in wholesale and retail prices. lag was greater when prices are falling than when they were rising

	Positives	Negatives
Pre-Payment Meter (PPM) Consumers	<ul style="list-style-type: none"> • Most active consumer segment in switching supplier 	Price premium charged to PPM consumers varied significantly between geographic regions, suppliers and range of energy consumption.

In order to overcome these negatives of the market operations, the Ofgem developed a package of measures, divided into two parts, to improve the functioning of the market. The main features of this package were as follows -

- The first part of this package addressed concerns over unjustified price differentials through two new licence conditions for domestic suppliers, which came into effect on 1 September, 2009. These conditions:
 - Required any difference in the terms and conditions offered by suppliers in respect of different payment methods to be cost reflective
 - Prohibited undue discrimination in any terms and conditions offered to consumers.
- The second part of the package promoted competition and consumer engagement and included obligations on suppliers to:
 - Improve the information they provide to customers on bills and in an annual statement
 - Help vulnerable and indebted customers who are currently blocked from changing suppliers due to outstanding debts
 - Improve the conduct of their sales and marketing activities
 - Help small business customers by providing them with better information regarding the terms and conditions of their contracts
 - Improve the transparency of their supply and generation activities.

These measures became part of suppliers' licences in October 2009, and were implemented between October 2009 and July 2010.

Philippines

Power market structure prior to reforms

The electricity industry of Philippines was an integrated utility before the watershed reforms of 2001. At that time, generation and transmission were under the control of the National Power Corporation (NPC). Meanwhile, the distribution of electricity to end-users was done by private investor-owned electric utilities, local government-owned utilities and electric cooperatives located within distinct franchise areas. Electricity end-users had no choice but to buy power only from their local distribution companies. At the same time, generating companies could sell power only to distribution companies, which in turn would re-sell the electricity to household and corporate end-users.

Reform process

The Electric Power Industry Reform Act of 2001 (EPIRA) was introduced to bring in watershed reforms in the then unsustainable power sector. The main features of this act are as follows:

- Deregulation of the generation sector
- Creation of a new government-owned transmission company and the eventual privatization of the transmission system

- Unbundling of supply activities from the regulated distribution sector
- Elimination of cross-subsidies within and among various grids, and among various classes of consumers
- Creation of an independent regulatory body (Energy Regulatory Commission) and a Joint Congressional Power Commission to oversee legal implementation
- Privatization and sale of NPC assets and contracts with Independent Power Producers (IPPs) Creation of a Wholesale Electricity Spot Market (WESM) for the trading of energy, by which competitive market forces would establish generation tariffs
- Implementation of retail competition and open access

The process of introducing retail supply competition in Philippines is currently on-going in a phase-wise manner. EPIRA, 2001 called for a number of changes to the power sector before the commercial implementation of retail supply competition. These reforms were meant to remove the existing barriers to competition and ensure the smooth functioning of retail supply competition. The changes brought in were as follows:

- **Privatisation of NPC assets:** Privatization and sale of NPC assets as well as contracts with IPPs were crucial for the implementation of retail supply competition. This would give government the cash flows needed to pay off NPC's debts and create a level playing field among generators, thus encouraging private sector investment. By the end of 2012, the Power Sector Assets and Liabilities Management Corporation (PSALM) had privatized more than 70% of the total capacity of generating assets of NPC in Luzon and Visayas. It had also transferred more than 70% of the total energy output of power plants under contract with NPC to the IPP administrators.
- **Removal of cross-subsidies:** EPIRA, 2001 required all cross-subsidies to be phased out in a gradual manner. As of October, 2005 all inter-grid, intra-grid and inter-class subsidies were removed. The lifeline rate scheme which subsidises marginalized end-use consumers prevails.
- **Universal charge (UC):** The ERC was mandated to establish Universal Charge to be recovered from all electricity end-users to account for, among other factors, all forms of cross subsidies that remain during the phase out period (other factors being payment for stranded debts, missionary electrification, equalization of taxes, and an environmental charge). This was to be non-bypassable charge collected from all end-users (except threshold and lifeline consumers) every month based on the approval of the ERC.

Introduction of retail supply competition

The commercial implementation of retail supply competition and open access in the Luzon and Visayas grids began on June, 2013. The phase-wise approach envisioned in official sources is as follows:

- **First Phase (2013 – 2015):** Consumers with a connected load greater than 1 MW would be considered contestable, i.e. they would have the right to choose their electricity retailer
- **Second Phase (to commence by end 2015):** Consumers with a connected load greater than 750 KW are to become a part of the contestable category
- **Subsequently and every year thereafter,** the Energy Regulatory Commission (ERC) shall evaluate the retail performance of the market in terms of the readiness of consumers (volume of consumption) and the Central Registration Board's (CRB) infrastructure and facilities. On the basis of such evaluation, ERC shall gradually reduce the threshold level until it reaches the household demand level.

According to studies by the ERC, there were 1,046 contestable consumers, 17 licensed retail energy suppliers and 24 local retail energy suppliers as of January, 2015.

Metering services

The Philippines' ERC has directed distribution companies in Luzon and Visayas to undertake the installation of time-of-use (TOU) meters for qualified contestable electricity customers under the first phase of implementation of open access and retail competition. The ownership of electric meters will remain with distribution companies as a general rule.

The installation of TOU meters by the concerned distribution companies is a requirement under Section 4.5.1, Article IV of the Distribution Services and Open Access Rules (DSOAR) and is reiterated in Section 5.1, Article II of the Rules for Contestability. The meters must be capable of measuring energy use and demand in a fashion consistent with WESM energy settlement intervals and distribution and transmission demand charge intervals.

Furthermore, under the Rules on Customer Switching, distribution companies will be the sole metering service provider (MSP) for the retail electricity market until metering services at the retail level become competitive as determined by the ERC. The distribution companies shall also conduct meter reading and data dissemination as a regulated service prior to the competitive metering service regime.

Consumer interface & consumer grievance redressal

Retail supply companies in the Philippines are required to have a helpdesk to address the concerns of its customers. This is of prime importance since the customer no longer deals directly with the distribution company. Furthermore, in case of issues such as failure of power lines the retail supply companies and the relevant distribution company need to agree on a protocol regarding the steps to be taken in addressing the issue and the information dissemination program of such to the affected customers.

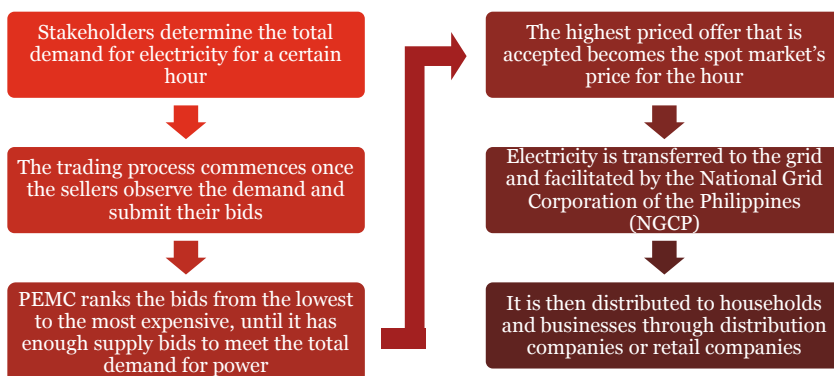
In case a customer has an unresolved dispute with his/her retail supply company or distribution company, he/she may file a complaint with the ERC. The ERC then undertakes to resolve the dispute as quickly, effectively and in as costless a manner as possible.

Procurement of power

The WESM was created following the restructuring of the energy sector by EPIRA, 2001. The market provides the mechanism for identifying and setting real-time prices taking into consideration actual variations from the quantities transacted under contracts between sellers and purchasers of electricity.

After several months of trial operations, the WESM commenced commercial operations in the Luzon grid on June, 2006 while the Visayas grid was integrated into the WESM in December, 2010. The Philippine Electricity Market Corporation (PEMC) facilitates the trading at WESM.

Currently, the trading process at WESM works in the following manner:



Presently the PEMC is exploring the possibility of introducing forward-market contracts in the wholesale energy market.

Tariff determination

Electricity tariffs in Philippines have been recorded to be among some of the highest in the world. However, regulators do not consider it to be a bad sign as these tariffs reflect the actual costs of supplying power. The components of power tariffs charged are as follows:

- Generation charges
- Transmission charges
- System losses
- Taxes, subsidies and universal charges
- Distribution, metering and supply charges

Currently, competitive pricing mechanisms are used by generation and retail supply companies and performance-based pricing mechanisms apply for transmission and distribution companies.

Supplier of Last Resort (SOLR)

In case the retail supply company fails to provide electricity to a contestable consumer or a contestable consumer is unable to have a retail supply contract with a retail business, the consumer may enter into a contract with a Supplier of Last Resort (SOLR) designated by the ERC. The last-resort supply of electricity serves as a temporary/short-term contract (lasting to a minimum of one billing cycle) until the consumer is able to switch to an energy retailer. In the initial phases of the reform process, the franchised distribution company is to serve as the SOLR for the contestable market in its franchise area.

The terms and conditions applicable to the supply of power through SOLR are proforma and are regulated by the ERC. The SOLR rate is the higher of:

- The applicable WESM ex-ante nodal energy price
- The bilateral contract price entered into by the SOLR plus a 10% premium

Victoria, Australia

Power market structure prior to reforms

Before the reforms in the 1990s, there was little scope for competition in the provision of electricity services in Australia. At that time, the electricity industry was largely characterised by government-owned vertically integrated entities.

In Victoria, it was the State Electricity Commission of Victoria (SECV) that was responsible for the generation, transmission and delivery of electricity to all citizens. Even though there were a number of small retail/distribution entities serving the urban areas, the existence of exclusive franchises for many of the entities and the absence of arrangements to permit new entry into parts of the industry effectively precluded competition.

Reform process

In August 1993, the State Government of Victoria commenced a review of the structure and operation of its electricity industry, which led to a phased disaggregation of the electricity industry. The main objectives behind restructuring Australia's electric power industry were to improve its economic efficiency as well as reduce state and national debt. The salient features of this process were as follows:

- Commercialization of state-owned electric organizations through privatization and through corporatization into separate governmental business units
- Structural unbundling of generation, transmission, distribution and retailing functions (and assets) to achieve vertical and horizontal disaggregation of the electricity industry
- Creation of a National Electricity Market (NEM) organized as a centralized, market-based trading pool for buying and selling electricity
- Establishment of appropriate regulatory regimes

The unbundling of Victoria's power sector led to the creation of:

- Several competing generation companies
- A monopoly transmission business
- Distribution companies with geographical monopoly franchises
- A two-tier system for retail businesses
 - First-tier retailers were those attached to a distribution business with a monopoly geographical franchise in the state. The retail business was 'ring fenced' from the distribution business (i.e. established as a separate accounting entity within one holding company).
 - Second-tier retailers were the stand-alone businesses not attached to a distribution business in the state. A second-tier retailer in Victoria could also be a first-tier retailer in another state.

In this manner, the natural monopoly functions of transmission and distribution of electricity were separated from the competitive functions of generating and retailing electricity. Generators and retailers traded electricity in a competitive wholesale market (NEM) as contestability was phased in over time. Transmitters and distributors charge regulated tariffs for transporting the electricity to customers and as of 2009 the existing caps on retail supply prices were removed. According to a report by the Essential Services Commission, there were 33 licensed electricity retailers in Victoria at the end of 2014 of which 23 were active in the market for residential and/or business consumers in 2013-14.

Introduction of retail supply competition

Retail supply competition was introduced in Victoria in a phase-wise manner beginning from December, 1994 and culminating in January, 2002 making it the first state in Australia where full retail competition was introduced. Retail Consumers were divided into two categories:

- Franchise consumers - consumers not open to competition i.e. they cannot choose their retail supplier and were supplied by the first tier retail supplier (the incumbent retail supplier in their area of supply).
- Non-franchise consumers – contestable consumers open to retail supply competition, who have the option of choosing their energy retailer.

Till a consumer became contestable (franchise consumers), the distributor who controlled the particular franchise area would also perform the functions of a retailer. Once consumers became contestable (Non franchise consumers), they were free to choose any licensed retailer, regardless of their base.

Phasing of retail supply competition

As discussed in the previous section, competition was introduced in Victoria's electricity retail market in phases based on decreasing annual energy consumption. The five phases of the process are outlined in the following table:

Time Period	Load Details (per annum)	Approximate No. Of Consumers
December, 1994	Above 40 GWh	47
July, 1995	4 GWh – 40 GWh	330
July, 1996	750 MWh – 4 GWh	1,500
July, 1998	160 MWh – 750 MWh	9,000
December, 2000	Below 160 MWh	957,300

Source: Australian Parliament Research paper

Metering services

The responsibility for metering services in Victoria lies with the retail supply company, which can fulfil this duty in either of the following ways:

- Appoint the distribution company as the company responsible for provision, installation and maintenance of metering systems
- Appoint a Metering Provider (a service provider accredited by the Australian Energy Market Operator) to undertake the duties of provision, installation and maintenance of metering systems
- If the consumer has not chosen a retailer, the first-tier retailer would have to perform the metering services

Furthermore, the Australian Energy Market Operator (AEMO) is in charge of collecting metering data, processing of that data and delivery of the processed data to the metering database and to the parties entitled to that data. The AEMO hires a Metering Data Provider to undertake these responsibilities.

Joint Metering: The Australian Electricity Rules (AER) contains the provision for joint metering. Under this provision more than one retail supply company can use a single meter for a particular connection point. They may choose to appoint the local distribution company to undertake the duties involved in metering or agree to appoint one of the retailers amongst them to undertake the same. In the absence of either of these two arrangements, the AEMO may step in and nominate one of the retailers to fulfil the metering responsibilities.

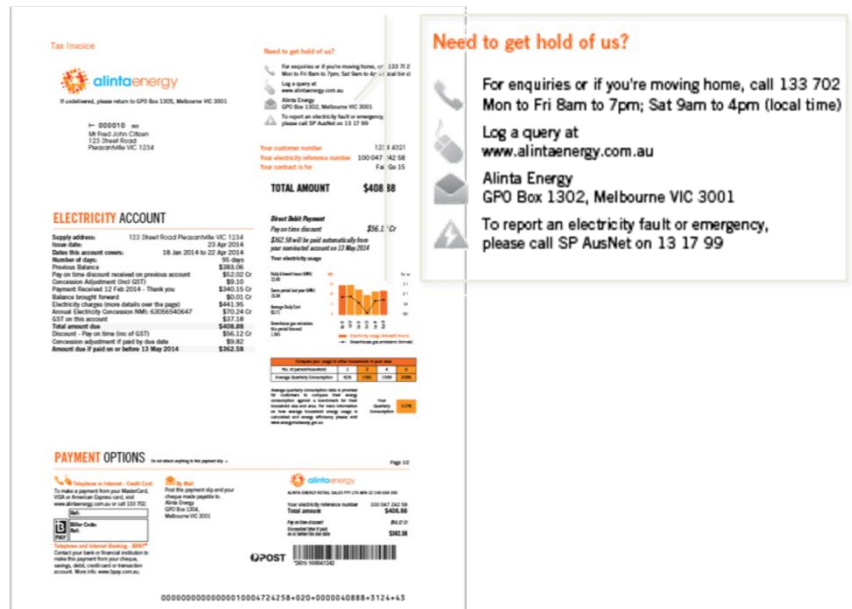
National Metering Identifier (NMI): The NMI is a ten character unique identifier provided to each metering installation in the NEM. A two character suffix to the NMI is used to identify the data stream associated with a connection point. This identification number is provided by the distribution company at the request of the retail supply company. The NMI remains unchanged with a change in consumer, consumer details or registration details and cannot be reassigned to another connection point.

Consumer interface & consumer grievance redressal

In the current sector scenario of Victoria, the distribution business and the retail supply business have separate consumer interfaces to deal with consumer complaints or queries or requests. If consumer has a complaint or enquiry about a supplier or network operator, he/she should:

- Contact that company directly in the first instance
- If the customer is still dissatisfied with the solution to the complaint, then the consumer can approach the Ombudsman

The Supply Company educates consumers on who to call in case of Power Cuts (Network related issues). A contact number is mentioned on the consumer bills which guides consumer regarding where to call in case of power cuts. This is in addition to the customer care number of retail business. Still, in case the consumer calls the Supply Company for network related issues, the consumer will be directed to the right interface based on their postal code.



Independent Consumer Grievance Redressal mechanism

Ombudsman Services: The Energy and Water Ombudsman (Victoria) (EWOV) is the free independent redressal scheme set up to investigate complaints from consumers who are unable to resolve issues with their distribution/supply company.

Powers of Ombudsman: Ombudsman can require the company to correct the problem, apologise, explain what happened and make a financial award. Its decisions, once approved by the consumer, are binding on the energy company.

Funding of Ombudsman: Case fee is charged to company. The fee may also depend on the number of complaints the company receives in the financial year. Its payment is not dependent on outcome. The service is free for consumers. This means that the more complaints companies resolve in-house, the less they pay.

Independence of Ombudsman: Ombudsman Services is governed by a board of directors and an independent Chairperson. The board ensures the independence of the Ombudsman service and has responsibility of appointing the Ombudsman.

Procurement of power

On December, 1998 the National Electricity Market (NEM) was established. This was to be Australia's major wholesale electricity market. It serves the states of New South Wales, Victoria, Queensland, South Australia, Tasmania and the Australian Capital Territory. Generation companies produce electricity and compete to sell it at the NEM. The transport of electricity from generators to consumers is then facilitated through a 'pool', or spot market, where the output from all generators is aggregated and scheduled at five minute intervals to meet

demand. The spot price set every five minutes (and averaged over half hour periods) is determined by the most expensive generator selected to run.

Additionally, there is also a separate over-the-counter short term forward trading market for electricity. In this market, purchasers lock in prices for future delivery of bulk electricity through financial hedging contracts. The NEM is one of the few purely cash settled electricity markets (i.e. financial contracts do not involve physical delivery of electricity). This arrangement enables participants such as hedge funds and banks to participate in the market without a requirement to own physical generation assets. AEMO is the market operator for the NEM and is responsible for generator dispatch, reliability management and financial settlements in accordance with the National Electricity Law and National Electricity Rules.

Tariff determination

Electricity tariffs charged to consumers in Victoria comprise three parts:

- Consumption cost – which can vary with the amount of energy consumed and when the energy is consumed (peak and off-peak)
- Supply charge – which includes the regulated distribution charge or network cost
- Any additional retail charges (charge relating to the sale of energy by a retailer to a customer other than a charge based on the tariff applicable to the customer) as allowed under the Energy Retail Code

Retail prices in Victoria are not regulated for either the first-tier retailers or the second-tier retailers.

Starting from September, 2013 electricity consumers in Victoria with remotely-read smart meters were given the option to choose between a flat rate tariff policy and a flexible rate tariff policy. The option of flexible tariffs meant that the rates charged for electricity consumption would differ according to the time of the day.

Retailer of Last Resort (RoLR)

If an energy retailer fails due to reasons such as revocation of licence, suspension of rights to buy electricity from the wholesale market, etc., all of its customers will be automatically transferred to the RoLR with no loss of connection. The RoLRs in Victoria are the three local retailers namely AGL, Origin Energy and Energy Australia which cover the entire state. In case one of the local retailers fails, its customers will be transferred to the two remaining local retailers.

Small customers (energy consumption less than or equal to 160 MWh) are sold electricity by their RoLR at tariffs, terms and conditions approved by the Essential Services Commission. Large customers (energy consumption greater than 160 MWh) will be sold electricity by their RoLR at tariffs, terms and conditions determined by commercial negotiation between them and the RoLR. The obligations of the RoLR cease after three months. For small customers who have not transferred to another retailer or have not entered a market contract with the RoLR, a default arrangement with their local retailer will prevail after three months.

Consumers can also choose to enter into a market contract with their RoLR. For market contracts, the tariffs, terms and conditions are negotiated between the consumer and the retailer. The terms and conditions, however, are required to be consistent with the Commission's Energy Retail Code.

Appendix

1. Universal Charge

A Universal Charge (UC) model is suggested for bringing about transparency and facilitating the cross subsidies reductions as per trajectories determined by the states. The UC, similar to the one levied in Philippines, would be an identical charge imposed on per-unit basis on sales to all consumers of incumbent distribution companies. Collection of UC would go towards a state-wide/national fund to reduce the extent of cross subsidy in retail supply and any revenue gap created in doing so.

The UC fund is proposed to cover any revenue gap created due to tariff realignments as per cross subsidies reduction trajectory. The duration of levy of this UC would be subject to the time period till the cross subsidies are reduced with 100% cost coverage for all consumer categories, and may be continued for as long as deemed to be required by the appropriate regulatory commission.

An illustration using cost of supply data from Punjab shows a simplified working model presenting the proposed mode of levying Universal Charge (UC) and its subsequent utilization towards reducing cross subsidies. The following assumptions are taken for the purpose of this illustration –

- Figures for category wise sales and CoS are taken from report by TERI on ‘Voltage wise-Category wise Cost of Supply’ in Punjab with base year of FY2012-13
- The current category wise sales figures are projected based on last 10 year CAGR
- Category wise CoS is projected based on a 5% y-o-y increase
- The assumed losses are maintained at current level throughout the time period of this model. Any improvement in efficiency may lead to a scenario where the increase in CoS is lower than expected, leading to lower tariff hikes.
- The illustration looks at a five-year time period. Cross subsidies (in this illustration) are entirely removed within this time period. SERCs may be extended this model to further years and/or modify the model accordingly once a timeframe is decided for elimination of cross-subsidies.

There are three stages in the proposed UC model –

STAGE 1 – *Tariff hikes required to maintain the current cost coverage*

Category wise tariffs are increased by the same percentage as the increase in their respective Cost of Supply. For instance if the CoS of a category XYZ increase by 5%, then the tariff for that category is also increased by 5%. This stage will only ensure that the current cost coverage is maintained for all consumer categories.

STAGE 2 – *Tariff hikes required to reach the targeted cost coverage*

Category wise cost coverages for subsidising/subsidised categories are decreased/increased respectively in a uniform fashion so as to reach 100% cost coverage by the end of next 5 years. These targeted category wise cost coverage values are multiplied with their respective CoS to get the required tariff from each consumer category. This stage therefore gives us the tariff hikes required for achieving 100% cost coverage in 5 years period. The table below shows the targeted category wise cost coverage trajectory for the state of Punjab.

Table 1 Targeted category wise cost coverage trajectory for UC model illustration of Punjab

Consumer Categories	BASE YEAR	YEAR 1	YEAR 2	YEAR 3	YEAR 4	YEAR 5
Industrial - 66 kV	116%	113%	110%	107%	103%	100%
Industry LS	109%	107%	106%	104%	102%	100%
Domestic – 11 kV	119%	115%	111%	107%	104%	100%
Commercial - 11 kV	118%	115%	111%	107%	104%	100%
Bulk	113%	111%	108%	105%	103%	100%
Industry MS	91%	93%	95%	96%	98%	100%
Industry SP	78%	82%	87%	91%	96%	100%
Domestic (0-100)	74%	79%	84%	90%	95%	100%
Domestic (101-300)	99%	100%	100%	100%	100%	100%
Domestic (above 300)	105%	104%	103%	102%	101%	100%
Agriculture	78%	83%	87%	91%	96%	100%
Commercial	102%	101%	101%	101%	100%	100%
Public Lighting	107%	106%	104%	103%	101%	100%

Source: PwC analysis

STAGE 3 – UC Charge calculation to meet the revenue gap generated

Due to imbalance between tariff and cost of supply in current scenario, gap exists between the revenue generated (category wise tariff multiplied by energy sales) and revenue required (category wise CoS multiplied by energy sales). The Universal Charge is collected from all consumer categories in order to compensate for this revenue gap. As the tariffs are increased/decreased year on year as per the calculation in Stage 2, this revenue gap decreases and so does the amount of Universal Charge.

The tables below present the illustration for a UC Fund based reduction in cross subsidy over a period of five years.

Consumer Categories	BASE YEAR			YEAR 1		STAGE 1		STAGE 2		STAGE 3					
	CoS	Tariff	CoS coverage	Sales	CoS	Tariff after CS Neutral Hike		Increase due to targeted CoS coverage		Increase due to cost/revenue mismatch					
						Tariff	CoS coverage	Tariff	CoS coverage	Revenue from stage 2 tariff (A)	ARR (B)	Gap to be filled by UC (A - B)	Tariff + UC	Revenue generated from UC	Additional fund required from govt.
Industrial - 66 kV	4.82	5.61	116%	2,426	5.06	5.89	116%	5.72	113%	1,389	1,228	(161)	6.22	121	-
Industry LS	5.13	5.61	109%	5,100	5.39	5.89	109%	5.79	107%	2,953	2,747	(206)	6.29	255	-
Domestic – 11 kV	4.90	5.81	119%	80	5.15	6.10	119%	5.91	115%	47	41	(6)	6.41	4	-
Commercial - 11 kV	5.09	6.03	118%	622	5.34	6.33	118%	6.13	115%	381	332	(49)	6.63	31	-
Bulk	4.94	5.59	113%	293	5.19	5.87	113%	5.73	111%	168	152	(16)	6.23	15	-
Industry MS	6.17	5.61	91%	1,861	6.48	5.89	91%	6.01	93%	1,118	1,206	88	6.51	93	93
Industry SP	6.57	5.10	78%	904	6.90	5.36	78%	5.66	82%	512	623	112	6.16	45	45
Domestic (0-100)	5.52	4.09	74%	5,440	5.80	4.29	74%	4.59	79%	2,499	3,153	653	5.09	272	272
Domestic (101-300)	5.52	5.49	99%	3,193	5.80	5.76	99%	5.77	100%	1,843	1,851	8	6.27	160	160
Domestic (above 300)	5.52	5.81	105%	1,550	5.80	6.10	105%	6.04	104%	936	898	(38)	6.54	77	-
Agriculture	5.33	4.18	78%	11,772	5.60	4.39	78%	4.63	83%	5,451	6,588	1,137	5.13	589	589
Commercial	5.92	6.03	102%	2,469	6.22	6.33	102%	6.31	101%	1,557	1,535	(23)	6.81	123	-
Public Lighting	5.62	6.03	107%	140	5.90	6.33	107%	6.25	106%	88	83	(5)	6.75	7	-
Total				37,035						19,554	20,957	1,404		1,852	1,174

UC Charge	0.50
UC Fund at start	0.00
UC Fund at end	448

	YEAR 2		STAGE 1		STAGE 2		STAGE 3					
			Tariff after CS Neutral Hike		Increase due to targeted CoS coverage		Increase due to cost/revenue mismatch					
Consumer Categories	Sales	CoS	Tariff	CoS coverage	Tariff	CoS coverage	Revenue from stage 2 tariff (A)	ARR (B)	Gap to be filled by UC (A - B)	Tariff + UC	Revenue generated from UC	Additional fund required from govt.
Industrial - 66 kV	2,453	5.31	6.19	116%	5.84	110%	1,431	1,303	(128)	6.14	74	-
Industry LS	5,139	5.66	6.19	109%	5.97	106%	3,070	2,906	(163)	6.27	154	-
Domestic - 11 kV	85	5.40	6.41	119%	6.00	111%	51	46	(5)	6.30	3	-
Commercial - 11 kV	677	5.61	6.65	118%	6.23	111%	422	380	(42)	6.53	20	-
Bulk	301	5.45	6.16	113%	5.88	108%	177	164	(13)	6.18	9	-
Industry MS	1,908	6.80	6.19	91%	6.43	95%	1,227	1,298	71	6.73	57	57
Industry SP	916	7.24	5.62	78%	6.27	87%	575	664	89	6.57	27	27
Domestic (0-100)	5,766	6.09	4.51	74%	5.14	84%	2,964	3,509	545	5.44	173	173
Domestic (101-300)	3,458	6.09	6.05	99%	6.07	100%	2,097	2,104	7	6.37	104	104
Domestic (above 300)	1,616	6.09	6.41	105%	6.28	103%	1,015	983	(31)	6.58	48	-
Agriculture	12,594	5.88	4.61	78%	5.12	87%	6,443	7,401	958	5.42	378	378
Commercial	2,688	6.53	6.65	102%	6.60	101%	1,774	1,755	(20)	6.90	81	-
Public Lighting	146	6.20	6.65	107%	6.47	104%	94	90	(4)	6.77	4	-
Total	38,974						21,982	23,169	1,187		1,169	748

UC Charge	0.30
UC Fund at start	448
UC Fund at end	430

	YEAR 3		STAGE 1		STAGE 2		STAGE 3					
			Tariff after CS Neutral Hike		Increase due to targeted CoS coverage		Increase due to cost/revenue mismatch					
Consumer Categories	Sales	CoS	Tariff	CoS coverage	Tariff	CoS coverage	Revenue from stage 2 tariff (A)	ARR (B)	Gap to be filled by UC (A - B)	Tariff + UC	Revenue generated from UC	Additional fund required from govt.
Industrial - 66 kV	2,479	5.58	6.49	116%	5.95	107%	1,474	1,383	(91)	6.20	62	-
Industry LS	5,178	5.94	6.49	109%	6.16	104%	3,190	3,075	(115)	6.41	129	-
Domestic - 11 kV	90	5.67	6.73	119%	6.09	107%	55	51	(4)	6.34	2	-
Commercial - 11 kV	737	5.89	6.98	118%	6.33	107%	467	435	(32)	6.58	18	-
Bulk	309	5.72	6.47	113%	6.02	105%	186	177	(9)	6.27	8	-
Industry MS	1,956	7.14	6.49	91%	6.88	96%	1,347	1,397	51	7.13	49	49
Industry SP	929	7.61	5.90	78%	6.92	91%	643	707	63	7.17	23	23
Domestic (0-100)	6,112	6.39	4.73	74%	5.73	90%	3,501	3,906	405	5.98	153	153
Domestic (101-300)	3,744	6.39	6.36	99%	6.38	100%	2,387	2,392	5	6.63	94	94
Domestic (above 300)	1,685	6.39	6.73	105%	6.52	102%	1,100	1,077	(23)	6.77	42	-
Agriculture	13,474	6.17	4.84	78%	5.64	91%	7,596	8,314	717	5.89	337	337
Commercial	2,928	6.85	6.98	102%	6.90	101%	2,021	2,006	(15)	7.15	73	-
Public Lighting	152	6.51	6.98	107%	6.70	103%	102	99	(3)	6.95	4	-
Total	41,047						24,741	25,633	892		1,026	663

UC Charge	0.25
UC Fund at start	430
UC Fund at end	565

	YEAR 4		STAGE 1		STAGE 2		STAGE 3					
			Tariff after CS Neutral Hike		Increase due to targeted CoS coverage		Increase due to cost/revenue mismatch					
Consumer Categories	Sales	CoS	Tariff	CoS coverage	Tariff	CoS coverage	Revenue from stage 2 tariff (A)	ARR (B)	Gap to be filled by UC (A - B)	Tariff + UC	Revenue generated from UC	Additional fund required from govt.
Industrial - 66 kV	2,506	5.86	6.82	116%	6.05	103%	1,517	1,468	(48)	6.15	25	-
Industry LS	5,217	6.24	6.82	109%	6.35	102%	3,314	3,253	(61)	6.45	52	-
Domestic - 11 kV	96	5.96	7.06	119%	6.18	104%	59	57	(2)	6.28	1	-
Commercial - 11 kV	803	6.19	7.33	118%	6.42	104%	515	497	(18)	6.52	8	-
Bulk	317	6.00	6.79	113%	6.16	103%	196	191	(5)	6.26	3	-
Industry MS	2,006	7.50	6.82	91%	7.36	98%	1,477	1,504	27	7.46	20	20
Industry SP	942	7.99	6.20	78%	7.63	96%	719	752	34	7.73	9	9
Domestic (0-100)	6,479	6.71	4.97	74%	6.36	95%	4,122	4,347	225	6.46	65	65
Domestic (101-300)	4,054	6.71	6.67	99%	6.70	100%	2,717	2,720	3	6.80	41	41
Domestic (above 300)	1,757	6.71	7.06	105%	6.78	101%	1,192	1,179	(12)	6.88	18	-
Agriculture	14,415	6.48	5.08	78%	6.20	96%	8,936	9,339	403	6.30	144	144
Commercial	3,188	7.20	7.33	102%	7.22	100%	2,303	2,294	(9)	7.32	32	-
Public Lighting	158	6.83	7.33	107%	6.93	101%	109	108	(2)	7.03	2	-
Total	43,264						27,879	28,381	502		433	282

UC Charge	0.10
UC Fund at start	565
UC Fund at end	496

	YEAR 5		STAGE 1		STAGE 2		STAGE 3					
			Increase due to rise in CoS		Increase due to targeted CoS coverage		Increase due to cost/revenue mismatch					
Consumer Categories	Sales	CoS	Tariff	CoS coverage	Tariff	CoS coverage	Revenue from stage 2 tariff (A)	ARR (B)	Gap to be filled by UC (A - B)	Tariff + UC	Revenue generated from UC	Additional fund required from govt.
Industrial - 66 kV	2,534	6.15	7.16	116%	6.15	100%	1,559	1,559	-	6.15	-	-
Industry LS	5,256	6.55	7.16	109%	6.55	100%	3,441	3,441	-	6.55	-	-
Domestic - 11 kV	102	6.25	7.42	119%	6.25	100%	64	64	-	6.25	-	-
Commercial - 11 kV	875	6.50	7.70	118%	6.50	100%	568	568	-	6.50	-	-
Bulk	326	6.30	7.13	113%	6.30	100%	205	205	-	6.30	-	-
Industry MS	2,056	7.87	7.16	91%	7.87	100%	1,619	1,619	-	7.87	-	-
Industry SP	956	8.39	6.51	78%	8.39	100%	801	801	-	8.39	-	-
Domestic (0-100)	6,867	7.05	5.22	74%	7.05	100%	4,838	4,838	-	7.05	-	-
Domestic (101-300)	4,390	7.05	7.01	99%	7.05	100%	3,093	3,093	-	7.05	-	-
Domestic (above 300)	1,833	7.05	7.42	105%	7.05	100%	1,291	1,291	-	7.05	-	-
Agriculture	15,422	6.80	5.33	78%	6.80	100%	10,491	10,491	-	6.80	-	-
Commercial	3,472	7.56	7.70	102%	7.56	100%	2,623	2,623	-	7.56	-	-
Public Lighting	164	7.17	7.70	107%	7.17	100%	118	118	-	7.17	-	-
Total	45,636						31,446	31,446	-		-	-

UC Charge	0.00
UC Fund at start	496
UC Fund at end	496

From the above discussed model we can observe that the year on year tariff hikes for subsidised categories due to tariff rationalisation can be very high leading to tariff shocks. These tariff hikes are further increased due to UC charge on all consumer categories. In order to protect subsidised categories from these tariff shocks, the state government can contribute to the UC Fund for the initial years on behalf of subsidised categories. The additional funds required from state government in the illustration of UC Model in Punjab, would be as follows:

Table 2 Additional fund requirement from state government based on UC model illustration of Punjab

(in Rs. Crore)	YEAR1	YEAR2	YEAR3	YEAR4	YEAR5
Industry MS	93	57	49	20	-
Industry SP	45	27	23	9	-
Domestic (0-100)	272	173	153	65	-
Domestic (101-300)	160	104	94	41	-
Agriculture	589	378	337	144	-
Total	1,174	748	663	282	-

Source: PwC analysis

2. Illustration for limiting cross subsidies to wheeling charges

Elimination of cross subsidies is important to allow for level playing field between various supply licensees under retail supply competition. However given the current situation, cross subsidies are likely to continue in the near future even after the content carriage segregation. Two basic principles may be adopted for dealing with residual cross subsidies in a retail supply competition scenario:

- Cross subsidies should be located in the wires component of the distribution tariff. Since wires are a monopolistic regulated industry and, therefore, are not subject to competition, market signals, though distorted, would not explicitly affect competition.
- It is possible, however, that the size of the some customer categories subsidy is too great to be captured in the wires tariff alone. In that case, the proper solution would be for the subsidy to be paid directly by government to the affected category.

Illustration -

For the purpose of illustrating this strategy, we have assumed there are four consumer categories with cost of supply and tariffs as given in the table below. The cost of supply is further broken down into wheeling charge, energy charge and customer charge.

After the advent of retail supply competition, the tariffs must be cost reflective, i.e. the tariff of any category must cover the energy and customer related costs.

If retail supply competition is to be introduced then cross subsidies need to be either reduced or located within the wires business only. Therefore the maximum possible cross subsidy for domestic consumer can be equal to the wheeling charges paid by them i.e. Rs 0.80/kWh. Under retail supply competition, either the tariff for domestic consumers must rise to at least 90% of CoS or the State Government will have to bear the cost of subsidization.

Table 3: Illustration for cross subsidies under retail supply competition (all figures in Rs/kWh)

		Domestic	Agricultural	Industrial	Commercial
CoS	Cost of Supply	6	9	2	4
W	Wheeling	2	4	0.5	2
E	Energy	2	2	1	1
C	Customer	2	3	0.5	1
T	Tariff	4	5	5	7
T-CoS	Existing cross subsidy	(2)	(4)	3	3
E+C	Min Tariff payable	4	5	-	-
W/CoS	Max cross subsidy possible	33%	44%	-	-

Source: PwC analysis

3. Illustrations for allocation of PPAs

Market Scenario I –

- Energy Surplus State
- Existing PPAs are expensive than the power available in the market

The following assumptions are made for the illustration:

- Total number of consumers – 10,00,000
- Current Power Requirement of Discom – 500 MW (or ~4.4 billion units)
- Current PPAs of Discom (transferred to Intermediary Company) – 450 MW (or ~4 billion units)
- United generation capacity - 100 MW (or ~800 million units)
- Number of Retail Supply Companies after introduction of competition – 2
- Number of consumers with Incumbent Supplier– 8,00,000
- Number of consumers with new Supply Company – 2,00,000
- Power requirement of Incumbent Supplier – 400 MW (or ~ 3.5 billion units)
- Power requirement of new Supply Company. – 100 MW (or ~ 0.9 billion units)
- Rate of power allocated by IC – Rs. 1 per unit (same as cost of its PPAs)
- Rate of power purchased from market/generator – Rs. 0.5 per unit
- Since this a market scenario wherein the cost of power in market is cheaper than cost of PPAs, any power purchased by a supplier from the market instead of IC is Opportunity Gain. On the other hand any power left with IC, is Opportunity Loss for IC.
- The formula used for allocation of power by IC to retail supply companies as per the 3rd mechanism is as follows –

Power allocated = (Number of consumers with supplier/total number of consumers)*Current PPAs

Scenarios/Approach	Approach 1 – D6A	Approach 2 – D6B	Approach 3 – D6C	Approach 4 – D6D	Approach 5 – D6E	Approach 6 – D6F
Power allocated by IC to incumbent supplier	400 MW	400 MW	350 MW	350 MW	360 MW	360 MW
Power allocated by IC to new Supply Co.	50 MW	50 MW	100 MW	100 MW	90 MW	90 MW
Power accepted by new Supply Co. from IC	50 MW	-	100 MW	-	90 MW	-
Power purchased from market by incumbent supplier	-	-	50 MW	50 MW	40 MW	40 MW
Power purchased from market by new Supply Co.	50 MW	100 MW	-	100 MW	10 MW	100 MW
Gain/loss to IC	-	(Rs. 45 million)	-	(Rs. 90 million)	-	(Rs. 81 million)
Gain/loss to incumbent supplier	-	-	Rs. 45 million	Rs. 45 million	Rs. 36 million	Rs. 36 million
Gain/loss to new Supply Co.	Rs. 45 million	Rs. 90 million	-	Rs. 90 million	Rs. 9 million	Rs. 45 million

Market Scenario II –

- Energy Surplus State
- Existing PPAs are cheaper than the power available in the market

The following assumptions are made for the illustration:

- Total number of consumers – 10,00,000
- Current Power Requirement of Discom – 500 MW (or ~4.4 billion units)
- Current PPAs of Discom (transferred to Intermediary Company) – 450 MW (or ~4 billion units)
- United generation capacity - 100 MW (or ~800 million units)
- Number of Retail Supply Companies after introduction of competition – 2
- Number of consumers with Incumbent Supplier– 8,00,000
- Number of consumers with new Supply Company – 2,00,000

- Power requirement of Incumbent Supplier – 400 MW (or ~ 3.5 billion units)
- Power requirement of new Supply Company – 100 MW (or ~ 0.9 billion units)
- Rate of power allocated by IC – Rs. 1 per unit (same as cost of its PPAs)
- Rate of power purchased from market/generator – Rs. 1.5 per unit
- Since this a market scenario wherein the cost of power in market is expensive than cost of PPAs, any power purchased by a supplier from the market instead of IC is Opportunity Loss. On the other hand any power left with IC, is Opportunity Gain for IC.
- The formula used for allocation of power by IC to retail supply companies as per the 3rd mechanism is as follows –

Power allocated = (Number of consumers with supplier/total number of consumers)*Current PPAs

Scenarios/Approach	Approach 1 – D6A	Approach 2 – D6B	Approach 3 – D6C	Approach 4 – D6D	Approach 5 – D6E	Approach 6 – D6F
Power allocated by IC to incumbent supplier	400 MW	400 MW	350 MW	350 MW	360 MW	360 MW
Power allocated by IC to new Supply Co.	50 MW	50 MW	100 MW	100 MW	90 MW	90 MW
Power accepted by new Supply Co. from IC	50 MW	-	100 MW	-	90 MW	-
Power purchased from market by incumbent supplier	-	-	50 MW	50 MW	40 MW	40 MW
Power purchased from market by new Supply Co.	50 MW	100 MW	-	100 MW	10 MW	100 MW
Gain/loss to IC	-	Rs. 45 million	-	Rs. 90 million	-	Rs. 81 million
Gain/loss to incumbent supplier	-	-	(Rs. 45 million)	(Rs. 45 million)	(Rs. 36 million)	(Rs. 36 million)
Gain/loss to new Supply Co.	(Rs. 45 million)	(Rs. 90 million)	-	(Rs. 90 million)	(Rs. 9 million)	(Rs. 45 million)

Market Scenario III –

- Energy Deficit State
- Existing PPAs are expensive than the power available in the market

The following assumptions are made for the illustration:

- Total number of consumers – 10,00,000
- Current Power Requirement of Discom – 500 MW (or ~4.4 billion units)
- Current PPAs of Discom (transferred to Intermediary Company) – 400 MW (or ~3.5 billion units)
- United generation capacity – 50 MW (or ~ 400 million units)
- Number of Retail Supply Companies after introduction of competition – 2
- Number of consumers with Incumbent Supplier– 8,00,000
- Number of consumers with new Supply Company – 2,00,000
- Power requirement of Incumbent Supplier – 400 MW (or ~ 3.5 billion units)
- Power requirement of new Supply Company – 100 MW (or ~ 0.9 billion units)
- Rate of power allocated by IC – Rs. 1 per unit (same as cost of its PPAs)
- Rate of power purchased from market/generator – Rs. 0.5 per unit
- Since in this market scenario the total power available (450 MW) is less than the total demand (500 MW), any supplier which is allocated power less than its power requirement, suffers an opportunity loss. Also since the power available in the market is cheaper than the power available with the Intermediary Company, any supplier which has to buy power from market, also gets an opportunity gain.
- Since this is a power deficit scenario, if both the suppliers approach market for purchasing power from the untied capacity, we assume that both the suppliers get proportionate amount of power. However in actual scenario the market price would be discovered through competitive bidding and suppliers with highest bid (or lowest tariffs, depending upon the auction mechanism) would get the power.
- The formula used for allocation of power by IC to retail supply companies as per the 3rd mechanism is as follows –

Power allocated = (Number of consumers with supplier/total number of consumers)*Current PPAs

Scenarios/Approach	Approach 1 – D6A	Approach 2 – D6B	Approach 3 – D6C	Approach 4 – D6D	Approach 5 – D6E	Approach 6 – D6F
Power allocated by IC to incumbent supplier	400 MW	400 MW	300 MW	300 MW	320 MW	320 MW
Power allocated by IC to new Supply Co.	-	-	100 MW	100 MW	80 MW	80 MW
Power accepted by new Supply Co. from IC	-	-	100 MW	100 MW	80 MW	80 MW
Power purchased from market by incumbent supplier	-	-	50 MW	50 MW	40 MW	40 MW
Power purchased from market by new Supply Co.	50 MW	50 MW	-	-	10 MW	100 MW
Gain/loss to IC	-	-	-	-	-	-
Gain/loss to incumbent supplier on account of power purchase	-	-	Rs. 45 million	Rs. 45 million	Rs. 36 million	Rs. 36 million
Loss to incumbent supplier on account of un-availability of power	-	-	(Rs. 45 million)	(Rs. 45 million)	(Rs. 36 million)	(Rs. 36 million)
Gain/loss to new Supply Co. on account of power purchase	Rs. 45 million	Rs. 45 million	-	-	Rs. 9 million	Rs. 9 million
Loss to new Supply Co. on account of un-availability of power	(Rs. 45 million)	(Rs. 45 million)	-	-	(Rs. 9 million)	(Rs. 9 million)

Market Scenario IV –

- Energy Deficit State
- Existing PPAs are cheaper than the power available in the market

The following assumptions are made for the illustration:

- Total number of consumers – 10,00,000
- Current Power Requirement of Discom – 500 MW (or ~4.4 billion units)
- Current PPAs of Discom (transferred to Intermediary Company) – 400 MW (or ~3.5 billion units)
- United generation capacity – 50 MW (or ~ 400 million units)
- Number of Retail Supply Companies after introduction of competition – 2
- Number of consumers with Incumbent Supplier– 8,00,000
- Number of consumers with new Supply Company – 2,00,000
- Power requirement of Incumbent Supplier – 400 MW (or ~ 3.5 billion units)
- Power requirement of new Supply Company – 100 MW (or ~ 0.9 billion units)
- Rate of power allocated by IC – Rs. 1 per unit (same as cost of its PPAs)
- Rate of power purchased from market/generator – Rs. 1.5 per unit
- Since in this market scenario the total power available (450 MW) is less than the total demand (500 MW), any supplier which is allocated power less than its power requirement, suffers an opportunity loss. Also since the power available in the market is expensive than the power available with the Intermediary Company, any supplier which has to buy power from market, also faces an opportunity loss.
- Since this is a power deficit scenario, if both the suppliers approach market for purchasing power from the untied capacity, we assume that both the suppliers get proportionate amount of power. However in actual scenario the market price would be discovered through competitive bidding and suppliers with highest bid (or lowest tariffs, depending upon the auction mechanism) would get the power.
- The formula used for allocation of power by IC to retail supply companies as per the 3rd mechanism is as follows –

Power allocated = (Number of consumers with supplier/total number of consumers)*Current PPAs

Scenarios/Approach	Approach 1 – D6A	Approach 2 – D6B	Approach 3 – D6C	Approach 4 – D6D	Approach 5 – D6E	Approach 6 – D6F
Power allocated by IC to incumbent supplier	400 MW	400 MW	300 MW	300 MW	320 MW	320 MW
Power allocated by IC to new Supply Co.	-	-	100 MW	100 MW	80 MW	80 MW
Power accepted by new Supply Co. from IC	-	-	100 MW	100 MW	80 MW	80 MW
Power purchased from market by incumbent supplier	-	-	50 MW	50 MW	40 MW	40 MW
Power purchased from market by new Supply Co.	50 MW	50 MW	-	-	10 MW	100 MW
Gain/loss to IC	-	-	-	-	-	-
Gain/loss to incumbent supplier on account of power purchase	-	-	(Rs. 45 million)	(Rs. 45 million)	(Rs. 36 million)	(Rs. 36 million)
Loss to incumbent supplier on account of un-availability of power	-	-	(Rs. 45 million)	(Rs. 45 million)	(Rs. 36 million)	(Rs. 36 million)
Gain/loss to new Supply Co. on account of power purchase	(Rs. 45 million)	(Rs. 45 million)	-	-	(Rs. 9 million)	(Rs. 9 million)
Loss to new Supply Co. on account of un-availability of power	(Rs. 45 million)	(Rs. 45 million)	-	-	(Rs. 9 million)	(Rs. 9 million)

4. Data for classification of states

Utility	Surplus/ Deficit, FY15 (%) ¹⁰	Availability of Power	AT&C less collection loss, FY13 (%) ¹¹	Loss Levels ¹²	Roll Out Scenario
Andhra Pradesh - APCPDCL	-4.87%	Deficit	13%	Low	3
Andhra Pradesh - APEPDCL	-4.87%	Deficit	6%	Low	3
Andhra Pradesh - APNPDCL	-4.87%	Deficit	13%	Low	3
Andhra Pradesh - APSPDCL	-4.87%	Deficit	11%	Low	3
Arunachal Pradesh	-9.90%	Deficit	57%	High	1
Assam	-7.05%	Deficit	26%	High	1
Bihar - BSEB	-2.77%	Deficit	48%	High	1
Bihar - NBPDC	-2.77%	Deficit	39%	High	1
Bihar - SBPDCL	-2.77%	Deficit	48%	High	1
Chhattisgarh	-1.25%	Deficit	22%	High	1
Delhi - BSES Rajdhani	-0.43%	Surplus	13%	Low	4
Delhi - BSES Yamuna	-0.43%	Surplus	13%	Low	4
Delhi - TPDDL	-0.43%	Surplus	12%	Low	4
Goa	-0.93%	Surplus	13%	Low	4
Gujarat - DGVCL	-0.02%	Surplus	12%	Low	4
Gujarat - MGVCL	-0.02%	Surplus	13%	Low	4
Gujarat - PGVCL	-0.02%	Surplus	30%	High	2
Gujarat - UGVCL	-0.02%	Surplus	14%	Low	4
Haryana - DHBVNL	-0.39%	Surplus	22%	High	2
Haryana - UHBVNL	-0.39%	Surplus	31%	High	2
Himachal Pradesh	-0.90%	Surplus	11%	Low	4
Jammu & Kashmir	-19.09%	Deficit	54%	High	1
Jharkhand	-2.75%	Deficit	35%	High	1
Karnataka - BESCO	-4.34%	Deficit	14%	Low	3
Karnataka - CHESCO	-4.34%	Deficit	15%	High	1
Karnataka - GESCOM	-4.34%	Deficit	19%	High	1
Karnataka - HESCO	-4.34%	Deficit	20%	High	1
Karnataka - MESCOM	-4.34%	Deficit	12%	Low	3
Kerala	-1.48%	Deficit	9%	Low	3
Madhya Pradesh - Madhya Kshetra VVCL	-0.55%	Surplus	31%	High	2
Madhya Pradesh - Paschim Kshetra VVCL	-0.55%	Surplus	26%	High	2
Madhya Pradesh - Purv Kshetra VVCL	-0.55%	Surplus	26%	High	2
Maharashtra - MSEDCL	-1.35%	Deficit	15%	Low	3
Manipur	-3.83%	Deficit	31%	High	1
Meghalaya	-15.34%	Deficit	35%	High	1
Mizoram	-6.59%	Deficit	29%	High	1
Nagaland	-3.92%	Deficit	38%	High	1
Odisha - CESU	-1.62%	Deficit	37%	High	1
Odisha - NESCO	-1.62%	Deficit	35%	High	1
Odisha - SESCO	-1.62%	Deficit	43%	High	1
Odisha - WESCO	-1.62%	Deficit	38%	High	1

¹⁰ Source: MoP report on Load Generation Balance Report, 2015-16

¹¹ Source: PFC report on The Performance of State Power Utilities for the years 2010-11 to 2012-13

¹² States with losses above 15% are put under 'High' losses category while the states with AT&C losses on or below 15% are put under 'Low' losses category

Utility	Surplus/ Deficit, FY15 (%) ¹⁰	Availability of Power	AT&C less collection loss, FY13 (%) ¹¹	Loss Levels ¹²	Roll Out Scenario
Puducherry	-1.08%	Deficit	12%	Low	3
Punjab	-1.00%	Surplus	17%	High	2
Rajasthan - AVVNL	-0.62%	Surplus	21%	High	2
Rajasthan - JDVVNL	-0.62%	Surplus	18%	High	2
Rajasthan - JVVNL	-0.62%	Surplus	19%	High	2
Sikkim	0.00%	Surplus	39%	High	2
Tamil Nadu - TANGEDCO	-3.14%	Deficit	21%	High	1
Tripura	-15.62%	Deficit	27%	High	1
Uttar Pradesh - DVVN	-15.62%	Deficit	27%	High	1
Uttar Pradesh - KESCO	-15.62%	Deficit	31%	High	1
Uttar Pradesh - MVVN	-15.62%	Deficit	25%	High	1
Uttar Pradesh - Pasch VVN	-15.62%	Deficit	28%	High	1
Uttar Pradesh - Poorv VVN	-15.62%	Deficit	26%	High	1
Uttarakhand	-3.00%	Deficit	21%	High	1
West Bengal	-0.55%	Surplus	30%	High	2

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