

***The cyclical process of production of new regulation  
by a bounded federal regulatory structure  
(With application to renewable regulation in India)***

***By***

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***Abstract***

*Our paper shows how “institutional” is the production of regulation’s ruling by studying the production of a new ruling in a federal structure with two levels of regulatory decision –making and two levels of judicial review. We show that a new applied regulation is produced in a process of trials and corrections induced by the incompleteness of the basic law and the limited rationality of regulators and judicial reviewers at the local and at the federal level. In a multi-level regulatory structure, being typically federal, that process of regulatory production is very cyclical (with five steps of innovation, imitation and correction). That process is both diversified (different units creating independently and differently the applied regulatory frame) and sequential (all units not entering the regulatory production on the same point and at the same moment). We applied the new analytical frame to a case study being the new regulation for renewable energy in India (a typically federal country).*

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## **1.1 Introduction**

Regulation has been analyzed in different ways but the process of production of rules by a regulatory institution has not been treated before. This entails an ‘institutional’ approach to regulation which places emphasis on the structure of the regulatory body and its ability to produce rules with incomplete law. Regulatory institutions are specifically setup in line with the needs of network industries which differ in their properties and federal nature of the country. Typically production of regulation follows a cyclical process when a federal regulatory structure deciphers an incomplete law to introduce competition in electricity industries. It comes from a process of trials and correction being sequential and producing a cycle of ruling and decision making following different stages.

The various federal regulatory institutions with their different levels of authority and hierarchy are constrained by their own bounded rationality or limited information when deciphering incomplete law for formulating and administering regulated contracts between generators and distributors of electricity. Thus the initial production of rules to develop a new market like the one of renewable electricity will be far from complete. As a result, the regulatory structure finds out the incompleteness through the hazards created out of administering contracts between generators, transmission and distributors of electricity. Following the hazards, the regulatory structure uses its authority or hierarchy to produce new layers of regulation or safeguards to get over the incomplete situation. This process will typically result in a cycle as there is a continuous production of regulation by various authorities at different levels to overcome initial incompleteness. In a federal institutional structure, we will typically encounter two levels of regulatory authorities (the federal and the local) acting mainly “ex ante” and two levels of judiciary authorities (federal and local) acting “ex post” to review decision taken by regulators.

The analysis of the production of regulation should therefore place importance on the institutional form of the regulatory structure i.e. in its organizational construction. The Williamsonian methodological approach of “incompleteness-hazards-safeguards” gives a conceptual basis to apply transaction cost economics to regulatory structures. However, the key tool to analyze the regulatory structure is found in the architecture of separation of powers: between the federal and the local level; as between regulatory and judicial authorities. Further, the cyclical production of regulation will be demonstrated on the renewable energy policy in India by using tariff orders,

case laws and power purchase contracts from 10 State Electricity Regulatory commissions and Appellate Tribunal for Electricity in India.

In the first section, we will construct our analytical frame as being a federal regulatory structure deciphering how to implement a new and incomplete electricity law. In the second section, we will show that this process results into five stages of trials and correction. They shape the cyclical production of regulation where a federal regulatory structure is engaged when implementing the incomplete law. In the third section, we will illustrate the very cyclical nature of this production of regulation through the renewable energy policy implemented by the federal state of India.

## **1.2 A 'New Institutional' approach to analyzing federal regulatory activity**

### **a) Bounded rationality hampering regulatory institutions tasks**

Regulatory institutions are setup with a mandate through a legislation i.e. a kind of 'regulatory contract' to produce regulation in certain network industries i.e. electricity. The most familiar problem with such a regulatory contract is that legislative rules initiating a new regulation are ambiguous or vague which gives broad terms like '*suitable measures to promote electricity*' without giving specific rules or guidelines for implementation. These broad legislations take the form of merely prescribing the competitive environment while the actual interpretation and implementation is left to the regulatory structures<sup>3</sup>. Due to bounded rationality assumption in transaction cost economics, the regulator herself finds it impossible to entirely decipher the law thus treating it as incomplete. This is manifested through a production of incomplete regulation at different levels that creates "regulatory hazards", frictions, hence transaction costs. The broad "regulatory contract" produces uncertainties putting restrictions on the ability of regulators in producing stable and robust regulation. The uncertainty is more so when there is no detailed authoritative determinations in the form of federal guidelines about the meaning and effect of new norms.

This broad legislation brings about a change not only in the way in which the industry is operated but also tests the regulator's ability to handle the hazards of regulatory production. Due to

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<sup>3</sup> "The concept of incomplete law is related to the concept of vagueness or indeterminacy of the law. In their economic analysis of "vague standards" as opposed to "bright line rules," Cooter and Ulen suggest that "in reality . . . legal commands are often vague and unpredictable." Pistor, Katharina, Chenggang, Xu. Summer 2003. "Incomplete Law - A Conceptual and Analytical Framework and its Application to the Evolution of Financial Market Regulation", New York University Journal of International Law and Politics, Vol. 35, No. 4, pp. 931-1013.

bounded rationality, the regulator is uncertain on how to go manage the inter-temporal regulatory transformation<sup>4</sup>. The regulator is given sub-tasks through the “regulatory contract” to produce detailed regulation which entails operational unbundling of vertically integrated electricity utilities (incumbent industry hierarchies) and moving them to unbundled markets for renewable energy. However that renewable energy is still passed to final consumers through “mandatory wheeling” obtained through regulated long term contracts or power purchase agreements. In India, the new “regulatory contract” does not specify which market model to move towards as a competitive solution<sup>5</sup>. Thereafter, Indian regulators mediate on the price at which the regulated network monopolies buy electricity from open utilities. Regulatory institution thereafter focuses on producing regulation to arrive at “just and reasonable rate”<sup>6</sup> price or tariffs at which the generators (open utility) buy from distributors (regulated network monopolies) of electricity. The price is prepared in India through rate hearing that is undertaken through bargaining or negotiated regulation. In this scenario, regulator acts as principal with the open utility and regulated network monopoly behaving as self interested agents<sup>7</sup>. The outcome of the process is that utility's tariff is a “judgment figure”--an estimate or opinion--based upon the evidence before the regulator.

The Indian broad law also mandates the regulator to formulate and administer long term contracts between open utility and regulated network monopoly and produce regulation for open access, interconnection (wheeling and incentives and settlement for payment of bills). The incompleteness in long term contracts or power purchase agreements occur due to uncertainty of the future combined with bounded rationality of the regulator creating problems of specifying future contingencies. Due to bounded rationality, all the terms and conditions around which sale should be conducted cannot be mentioned thus leading to certain future breakdown in power purchase agreement. The incompleteness of the law and the tasks places emphasis on the design

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<sup>4</sup> Williamson, Oliver E. May 2005. “The Economics of Governance,” *American Economic Review*, 95 (2)

<sup>5</sup> Blumsack, Seth A., Jay Apt, Lave. Lester B. March 2006. “Lessons from the Failure of U.S. Electricity Restructuring”, *The Electricity Journal*, Volume 19, Issue 2,, Pages 15-32, ISSN 1040-6190, DOI: 10.1016/j.tej.2005.12.008.

<sup>6</sup> Historically, the just and reasonable standard seeks to provide utilities a fair return on value. See, e.g., *Bluefield Waterworks & Improvement Co. v. Pub. Serv. Comm'n of W. Va.*, 262 U.S. 679, 690 (1923) (holding that governmentally imposed utility rates that are on the value of property employed in the provision of service that is equal to a return earned by other businesses facing similar risks); see also *Smyth v. Ames*, 169 U.S. 466, 546-47 (1898) (ruling that the fair value of property used, costs of construction, improvements, and other expenses should be examined when calculating the reasonableness of rates set by federal government for railroads).

<sup>7</sup> “Public utility regulation has long been recognized as an example of agency relationship where the regulator (the principal) attempts to provide incentives for the public utility (the agent) to serve its demand in a least-cost manner at a price that only recovers observed costs.” Wolak FA. 2008. “Public Utility Pricing and Finance”, in *The New Palgrave Dictionary of Economics* by Steven N. Durlauf and Lawrence E. Blume (eds.), Palgrave Macmillan, Second Edition.

of the regulatory institution to provide adaptable detailed regulation and find solutions to overcome the incompleteness.

### **b) Institutional Design and construction of the Federal Regulatory Structure**

The above tasks place emphasis on the construction of the regulatory structure to decipher the broad law and to produce detailed regulation for the sub-tasks. The construction should take into consideration the federal nature of the country as well as the technical and structural characteristics of the electricity market. The federal nature of a multi-divisional form of regulation (M-form) involves the sharing of authority between federal and local level, often leaving local agencies with discretion to implement broad federal policy goals, binding criteria, or guidelines<sup>8</sup>. It is typical of India and the European Union. It is not identical to the USA where (roughly) a federal regulator implements federal rules in the federal area of competence, while local regulators implement local rules in the local areas of competence. Regulatory federalism of the M-form kind is therefore a particular scheme of decentralized governance, designed to “down load” the provision of regulatory services. Regulatory structure based on M-form organization is working in the electricity sector taking into account the technical (non-storability, simultaneousness of production and consumption, externalities resulting from interconnection between generation, transmission and distribution) and structural properties of the electricity sector. This dictates that electricity must be made, consumed and distributed in fairly localized geographic regions or sub-units. This interconnectivity must be visualized as electricity networks in sub-units that are connected to federal networks. Therefore, this necessitates a regulatory structure with a hierarchy and authority that can balance with federalism and electricity markets. Within this context, the M-form regulatory structure that is constructed follows the pattern of regulatory federalism. Regulatory federalism will include<sup>9</sup>

1. Collection of regulatory institutions in the local sub-units with administrative, semi-legislative powers to rule and oversee local specific activities (local ex ante).

2. Local courts of regulation (local ex-post) with judicial powers to adjudicate on the proper functioning of the local regulator.

3. High court of regulation (higher ex-post) with judicial powers to adjudicate on the proper functioning of the local courts and local regulators.

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<sup>8</sup> Weiser Philip J. Fall 2003. “Cooperative Federalism and its Challenges”, Michigan State DCL Law Review.

<sup>9</sup> Kelemen, R. Daniel. 2004. “The Rules of Federalism: Institutions and Regulatory Politics in the EU and Beyond”. Cambridge, MA: Harvard University Press.

4. A common product i.e. electricity to regulate in accordance with basic liberalization or competition principles.

5. Local governments, regulators and courts recognizing that the high court is the “ultimate arbiter of disputes”.

Where the intensity and frequency of relations between regulatory local units and central (=federal) regulatory unit are low, the M-Form of regulatory structure degrades in a more loosely managed regulatory structure which is similar to a “Staff and Line” organization. A light central staff produces principles and broad rules while the bulk of operational activity and detailed ruling is operated in local unit. It is the typically Indian and European “decentralized line and staff regulatory organization” dealing with electricity. The regulatory structure has a federal regulator or a high court of regulation having control over state regulatory institutions that are located in each geographic area that manage a common product. Within the regulatory structure, the organizational design follows the separation of powers principle<sup>10</sup> for producing regulation. In India three branches are combined as quasi-legislative (public rule making), executive (rule implementation) and quasi-judicial (enforcing the force of the public rule) branches to form under one judicial authority namely to oversee a defined area of government interest.

In terms of producing regulation, quasi-legislative and administrative branches are complementary<sup>11</sup> branches where rule making and implementation of rules go hand in hand. Therefore, for the purposes of analysis, the state regulatory institutions having quasi-legislative and executive branches are termed as **ex-ante branch** while the quasi-judicial or enforcement role is termed as the **ex-post branch**. **Higher ex-post** or high court of regulation is the judicial branch that has direct control over state regulatory institution actions. It is assumed in the framework that this is the court of final appeal or the High Court of Regulation. Parties to the long term contract and tariff formation who feel that they have been damaged by the actions of ex-ante branch or by regulated firms or have engaged in behavior that violates the regulatory contract may sue in local ex-post or higher ex-post for relief or damages<sup>12</sup>.

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<sup>10</sup> Magill, M. Elizabeth. September 2000. "The Real Separation in Separation of Powers Law", Virginia Law Review. (UVA School of Law, Public Law RPS version)

<sup>11</sup> “legislation and administration are complementary rather than opposed processes; and . . . delegation is the formal term and method for their interplay. . . . Power should be delegated where there is agreement that a task must be performed and it cannot be effectively performed by the legislature without the assistance of a delegate or without an expenditure of time so great as to lead to the neglect of equally important business. Delegation is most commonly indicated where the relations to be regulated are highly technical or where their regulation requires a course of continuous decision.” Jaffe L. 1965. “Judicial Control of Administrative Action”, Little Brown and Company

<sup>12</sup> Hermalin, Benjamin E., Katz, Avery and Craswell, Richard. April 2007. “The Law and Economics of Contracts”. Columbia Law and Economics Working Paper No. 296.

### **1.3 Cyclical Production of Regulation: A framework of ‘Trials and Corrections’**

Given the above institutional design, local regulators engage in a ‘trial and correction’ process based on sequential and cyclical production of regulation when deciphering the broad law and producing the corresponding local sub-tasks. Being boundedly rational, the ex-ante branch within the federal regulatory structure engages in an initial production of regulation which is incomplete. This incompleteness is manifested by the hazards for which the local branches using its powers within that regulatory structure produce additional regulation in the form of detailed rules or safeguards to rectify the initial incomplete production of regulation. Recognizing that there is incomplete production of regulation requires that powers should be aligned in a discriminating manner within the branches to produce gap filling regulation for transaction cost economizing outcomes<sup>13</sup>. By using the properties of Williamson's “remediableness”, when one branch (e.g. local ex-ante) of the regulatory structure uses a ‘trial’ method leading to persistent incompleteness or maladaptation in production of regulation, then other branches will further intervene (i.e. ex-post and then higher ex-post branches) to step in to ‘correct’ the too imperfect regulation. This ‘trials and correction’ process with a sequence of various regulatory interventions leads to a cyclical production of regulation involving all the ex ante, ex post and higher ex-post branches of the regulatory structure. It is why the production of regulation is cyclical because it logically consists of five core stages:

Stage1: Local “ex-ante” production of more detailed rules to start implementing the new policy;

Stage 2: “Local ex-ante / ex-post” interaction to filling errors and gaps found into the first stage of detailed ruling;

Stage 3: “Higher ex-post” interacting with local “ex-ante / ex-post” to review detailed local regulation and to reset core strategic preferences;

Stage 4: Imitating among local “ex ante” and / or “ex post” to reproduce the more mature local detailed regulation;

Stage 5: Local innovation to producing new detailed regulation responding to substantial environment changes.

**Stage1: Local “ex-ante” production of more detailed rules to start implementing the new policy**

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<sup>13</sup> Williamson, Oliver E. May, 1998. “The Institutions of Governance”, The American Economic Review, Vol. 88, No. 2, Papers and Proceedings of the Hundred and Tenth Annual Meeting of the American Economic Association pp. 75-79

Following a change in law, the regulatory structure has to handle the transformation brought about by legal change by producing initial regulation. This provides challenges on the ability of the regulatory structure to devise credible unbiased rules that persist through time and to enforce them in a consistent manner<sup>14</sup>. Ex-ante local branch must follow a smooth *transition policy*<sup>15</sup> for maintaining credible commitment. This means that investors in previous legislations are accommodated within the new legislation without hardship to their investments. Moreover, making the new policy applicable to currently pending reforms would contribute to developing credibility for the new law, while exempting such reforms would no doubt make it that much harder for the announced change in future transition policy to be credible. Given bounded rationality in arriving at prices and cost structures, the ex-ante local branch must engage in *screening activities* to acquire knowledge about the market and to correctly identify opportunism plaid by participants in electricity market. Screening devices<sup>16</sup> in the form of reports from independent sources will help economize on hazards of adverse selection and gather information about the restructured utility market. *Safeguards* in the form of hostages<sup>17</sup> e.g. letter of credit, security deposits interest in case of delayed payment may be devised as credible commitment. This transformation stage also brings with it *additional provisions* that mandates the ex-ante local branch of the regulatory institution to perform tasks which can be safeguard measures aimed at regulated network monopolies by forcing them to take an action to ensure credible commitments e.g. renewable portfolio obligations.

Following the initial production of regulation, the boundedly rational local ex-ante branches within the federal structure will arrive at a variety of different interpretations causing a ‘patchwork’ of incomplete production of regulation in the large territory covered by the federal order. Incompleteness occurs as a result of maladjustment between the old law and the new law<sup>18</sup>

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<sup>14</sup> Wallis, John Joseph. September 2008 “Institutions, Organizations, and Interests”, The conference on The Dynamics of Institutions in Perspective: Alternative Conceptions and Future Challenges.

<sup>15</sup> Kaplow, Louis. 2003. "Transition Policy: A Conceptual Framework," 13 Journal of Contemporary Legal Issues 161

<sup>16</sup> “I do not insist that every individual is continuously or even largely given to opportunism. To the contrary, I merely assume that some individuals are opportunistic some of the time and that differential trustworthiness is rarely transparent ex ante. As a consequence, ex ante screening efforts are made and ex post safeguards are created. Otherwise, those who are least principled (most opportunistic) will be able to exploit egregiously those who are more principled.” Williamson Oliver E. 1985. “The Economic Institutions of Capitalism”, The Free Press.

<sup>17</sup> Williamson, Oliver E. 1983. “Credible Commitments: Using Hostages to Support Exchange” American Economic Review

<sup>18</sup> “The notion of legal transition costs reflects a simple, but potentially significant, idea: that a legal system will experience transitional friction simply in adjusting to the existence of a new positive law norm.”

Van Alstine, Michael P. 2002. “Treaty Law and Legal Transition Costs”, Symposium on Constructing International Intellectual Property Law: The Role of National Courts, Chicago-Kent Law Review.



i.e. when the regulator is not able to arrive at the proper transition provision. Almost any change in legal rules or market conditions that is not fully anticipated will affect the value of firms, assets, or other investments that are directly targeted, such as those competing with the targeted investments. Further within the federal regulatory structure, if local ex-ante branches have neither conducted screening activities nor provided safeguards to ensure proper transformation provisions this leads to breakdown performance of long term contracts. The patchy and incomplete production of regulation by the local ex-ante branches will result in contractual breakdown and litigation thus requiring local ex-post branch intervention.

**Stage 2: “Local ex-ante / ex-post” interaction to filling errors and gaps found into the first stage of detailed ruling**

Local ex-post branch or the quasi judicial within the regulatory structure produces default rules or gap filling rules<sup>19</sup> to overcome the initial incomplete production of regulation for both pricing and long-term contracts . These defaults seek to answer the question what ‘would have been’ the ideal solution if the parties to the long term contract had contracted using these rules to achieve credible commitment. Within this context, local ex-post branch can produce ‘*bounded rationality based gaps filling*’ when performance of the long term contract is held up due to undue regulation of the contract. It is for the local judge to find the ‘nearest term’ that will most likely replace the offending term and to fill gaps in the regulated contract. Also, local ex-post branch reinterprets the contract by supplying contractual vocabulary<sup>20</sup> or by providing better understanding of the agreements. This allows the local ex-post branch undertake tariff re-looks and can also rectify internal policies of the now regulated network monopoly which can create administrative hold-up for the liberalized market when transacting with open utilities or renewable energy suppliers. Local ex-post branch can also use gap-filling exercise to overcome incompleteness of local state policies. Secondly, the local ex-post role of enforcement is to supply gap filling rules by providing more meaning to existing contractual vocabulary contract performance in the event of a dispute by drawing existing legislations. Local ex-post branch can also provide ‘*opportunism based gap filling*’ where it provides regulation or safeguards as deterrence against hazards of opportunism which leads to breakdown in long-term contracts. These deterrent default rules may be in the form of warranties or guarantees which essentially form safeguard mechanisms or deterrence mechanisms e.g. money damages (fines) or safeguard measures in the form of

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<sup>19</sup> Suggested gap filling in cases where the only assumed obstacle is transaction costs would therefore not justify a law-supplied gap filler because the parties might devise general clauses to make up for their lack of foresight. Ayres, Ian. 2001. “Default Rules for Incomplete Contracts”, The New Palgrave Dictionary of Economics and the Law.

<sup>20</sup> Schwartz, Alan. 2002. “Contract Theory and Theories of Contract Regulation”, ISNIE Conference.

hostages i.e. letter of credit or safety deposits. On the other hand, local ex-post branch supplies a satisfactory solution to a contracting problem to parties whose contract lacks that solution. This is related to the moral hazard problem when the parties are unable to observe the actions of each other; local ex-post branches incorporate safeguards provisions or rules/standards for efficient performance.

In this stage, local ex-post branches' gap filling may not produce enough or appropriate regulation to rectify the incompleteness in pricing and power purchase agreements. The parties to the contract (open utility or regulated network monopolies) who are not satisfied with the production of regulation from the previous stages can approach the higher ex-post to produce more regulation to overcome the incompleteness. Moreover, production of regulation through the gap filling rules is limited giving credible commitment to long term contracts. For changing incomplete market arrangement such as open access, transition provisions, it requires the intervention of the higher ex-post which leads to Stage -3 in the cyclical framework. However the cost, benefit and risk of seizing the higher ex post judicial level is at a totally different scale. It explains why local market players do not enter first at the higher ex post level to solve local conflicts with the regulated contract implementation provided by the local ex ante regulator or the local ex post judiciary. For all players, entering the high level ex post judiciary play is a high cost, high risk and widely dispersed benefit strategic move.

### **Stage 3: “Higher ex-post” interacting with local “ex-ante / ex-post” to review detailed local regulation and to reset core strategic preferences**

In this third logical stage, higher ex-post (or the high court of) regulation gives a hard look on the production of regulation by the local ex-post and ex-ante branches. The strategic nature of this approach assumes that these higher judges have a sophisticated understanding of the legislative framing of the regulatory process. This in literature is commonly referred to as judicial review of administrative actions or hard look review; where judicial review is commonly justified as a tool for keeping agencies within the true limits or due process of their powers. Higher ex-post review of a local ex-post branch action occurs during a period of transformation/deregulation to ensure that regulations produced are not "arbitrary, capricious, an abuse of discretion, or otherwise not in accordance with law"<sup>21</sup> or that a regulation committed an

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<sup>21</sup> Citizens to Preserve Overton Park v. Volpe, 401 U.S. 402, 411-14 (1971) (quoting 5 U.S.C. § 706(2)(A) (1964)).

error of interpretation or reached a decision which no reasonable agency would have reached”<sup>22</sup>. Following the ‘hard look’, higher ex-post will provide credible commitment by crafting safeguard and gap filling measures through additional but superior regulation which will override the long term agreements and price formation made by local regulatory institutions. Reviewing allows the higher ex-post to impose their strategic preferences on local ex-post decisions<sup>23</sup>. By applying its strategic preferences higher ex post will show 1) that local ex-post has failed to justify the reasoning behind its actions, 2) that higher ex post seeks more explanation on arrival of such a policy, 3) that higher ex post considers other regulatory alternatives offered by interested parties, considers all the evidence offered to it during the rulemaking process, or discusses why local level changed the policy in the first place<sup>24</sup>.

#### **Stage - 4 Imitating among local “ex ante” and / or “ex post” to reproduce the more mature local detailed regulation**

Local detailed regulation can also be produced by imitating other local regulatory institutions or higher ex-post. This is possible because of the very nature of the federal system where the regulatory institutions are spread among different local states. Imitation is because of the level of autonomy given to the local state regulatory institutions to develop the market at their own pace in their sub-units and this causes the local state regulatory institutions to produce “common” regulation at an uneven pace. Therefore, there are time inconsistencies in giving prices and power purchase agreements for developing electricity market in the local states. It is what allows local regulatory institutions to imitate one another. During the lag period the ex-ante branch of one local state regulatory institution has time to observe and imitate the production of regulation of other local state regulatory institutions in their sub-units. The criteria for imitation are two-fold 1) technical and financial parameters for arriving at prices and power purchase agreements in local ex ante regulation and 2) learning from local ex-post branch and higher ex-post enforcement. This imitative process follows a sequential pattern consisting of three analytical steps.

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<sup>22</sup> In *R. v Inland Revenue Commissioners Ex p. Preston* (HL) House of Lords (1996) “Judicial review is available where a decision-making authority exceeds its powers, commits an error of law, commits a breach of natural justice, reaches a decision which no reasonable tribunal could have reached or abuses its powers.”

<sup>23</sup> The hard look review has been challenged on the plausible but admittedly speculative ground that judges’ policy preferences affect judicial decisions about whether agency decisions are “arbitrary.” Miles, Thomas J., and Sunstein, Cass R. 2007. “The Real World of Arbitrariness Review”. University of Chicago Law Review, Forthcoming; U of Chicago Law & Economics, Olin Working Paper No. 368,

<sup>24</sup> Tiller, Emerson H., & Smith, J.L. 2002. “The strategy of judging: Evidence from administrative law”, The Journal of Legal Studies, U. Chicago Press,

In a first step, the '*first regulatory movers*' open the new market by developing an initial set of regulation. First regulatory movers develop their own technical and financial parameters and produce new detailed regulation for transition provisions, safeguard measures and screening activities. Next, the local regulatory institutions known as '*mid-term regulatory entrants*' enter the federal new policy and produce their corresponding detailed regulation by imitating the first regulatory movers. The mid-term entrants enter the new policy when the ex-ante branches of the first movers have already formed and are executing initial production of regulation. However, because they enter at mid-term, these entrants are not yet able to observe additional regulatory production by the local ex-post or higher ex-post. Therefore the mid-term entrants will mainly imitate the technical and financial parameters from the first mover ex-ante branches. To end, the '*late regulatory movers*' are local ex-ante branches who have had sufficient time to observe both other local ex-ante production of regulation and some local ex-post and higher ex-post enforcement for other sub-units. The late movers produce regulation or credible commitment measures by gaining from experiences of other regulatory institution whose decision have been tested and enforced at the ex-post / higher ex-post levels.

#### **Stage - 5 Local innovation to producing new detailed regulation responding to substantial environment changes**

The final stage in the cyclical production of regulation is again "innovation" being a significant adaptation of the system of regulation. This may be due to regulatory structures being unable to achieve the federal policy in the existing incomplete framing. Therefore, the regulatory structure ends producing a new frame of regulation whereby previously experienced transactional difficulties are circumvented<sup>25</sup>. This production might also take a '*natural*' path occurring due to a substantial change in the institutional arrangement or the emergence of a new institutional arrangement initiated, organized or executed by the federal level<sup>26</sup>. It can be changes in the institutional environment (rules of the game) by changing over to a new set of rules for production of regulation e.g. rate of return regulation replaced by competitive bidding. On the other hand '*imposed*' innovation transpires when the state regulatory institution is unable to find the proper safeguard measures for credible commitment mechanism. Therefore, local innovation to producing new detailed regulation responding to substantial environment changes can be *imposed* by the higher ex-post on a local regulatory institution through the hard look review using

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<sup>25</sup> Williamson, Oliver E., Winter, Sidney & G., Coase, Ronald H. 1993. "The Nature of the Firm", Oxford University Press,.

<sup>26</sup> Yifu, Lin Justin. 1989. "An Economic Theory of Institutional Change: Induced and Imposed Change", Cato Journal, Vol 9 No. 1, Spring/ Summer.

the higher ex post strategic preferences. By doing so, it can make local regulatory institutions to innovate or modify their existing regulation by moving it to. This fifth stage of innovation opens another cycle of production of regulation as it brings about its own incompleteness, hazards and safeguards.

Such a cycle of new federal policy followed by several stages of innovation – imitation – interaction among local ex ante or ex post branches, with some strategic realignment imposed by the higher ex post have been repetitively seen in the European Union. The EU started designing its “market based” electricity reform in 1991, ending in 1996 with the first incomplete federal law (named 1<sup>st</sup> EU energy package), reoriented with a second EU energy package in 2003, and a third EU energy package in 2009. However the next section will deal with demonstrating the very cyclical production of regulation in another part of the world being India. It applies to a new federal energy policy being the renewable energy policy.

### **Evidence of cyclical production of regulation in implementing the renewable energy policy in India**

Indian electricity regulatory structure’s mandate of promotion of new source of electricity (i.e. renewable energy) emerging through a new and incomplete law offers an ideal application of our theoretical framework. India's characteristics appear as an ideal case study: firstly, the passing of the Indian Electricity Act, 2003 focused on liberalizing the electricity sector by separating generation, transmission and distribution services. Under Indian Electricity Act of 2003, generation (Sec 7), except hydro Sec 8 (1&2) has been de-licensed and third party sales or open access Sec 1(47) on intervening transmission lines has been provided. Secondly, the Indian Electricity Act 2003 also setup the Indian Electricity Regulatory Structure having a hierarchy and institutional design of State Electricity Regulatory Commissions (SERCs)<sup>27</sup> at the local state level and a higher Appellate Tribunal for Electricity (ATE) at the federal level. Thirdly, local ex-ante branch of State Electricity Regulatory Commissions (SERCs) are given responsibility to promote a new market (i.e. electricity produced through renewable energy sources (RES)) under Section 86 (1) (e) of the Indian Electricity Act 2003 which states:

*‘promote co-generation and generation of electricity from renewable sources of energy by providing suitable measures for connectivity with the grid and sale of electricity to any person, and also specify, for purchase of electricity from such*

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<sup>27</sup> Following the passing of the Electricity Regulatory Act 1998, State Electricity Regulatory Commissions were set up from 1998. This Act is now superseded by the Indian Electricity Act of 2003.

*sources, a percentage of the total consumption of electricity in the area of a distribution license’.*

The section of law promoting RES is broad due to the term ‘*providing suitable measures*’. In addition, that Section has also given a safeguard measure or an added provision that the SERC has to ‘*specify, for purchase electricity from such sources, a percentage of total consumption of electricity in the area of distribution licensee*’. This is a safeguard measure against the dominant status of the monopolies( i.e. distribution licensees) by forcing them to purchase RES through the legislation. This has been called the renewable portfolio obligation by various SERCs.

To provide specific guidelines, the National Electricity Policy<sup>28</sup> and National Tariff Policy<sup>29</sup> were notified<sup>30</sup> in 2005 and 2006 to give more meaning to the terms ‘*suitable measures*’ and to guide the SERCs in the interpretation of Sec. 86 (1) (e). The National Electricity Policy stated that an ‘*appropriate differential in tariff*’ should be offered for promoting RES while the National Tariff Policy dictated ‘*preferential tariffs*’. Both policies concentrated solely on the pricing of RES and did not take into account other frictions such as hazards of transformation, market arrangements & incentives for RES, etc.

Using the incomplete law and narrow federal guidelines, the boundedly rational local ex-ante branches of SERCs in the local states have produced regulation by way of tariff orders, mediated on power purchase agreements & have given open access provisions. Since ‘*suitable measures*’ are not properly defined the orders and provisions were incomplete as they did not focus on safeguards and transformation mechanisms. This has led to hazards in promoting RES. Being imperfect, SERCs became involved in court based production of regulation at the local ex-post branch and higher ex-post level (i.e. Appellate Tribunal for Electricity (ATE)) with the RES and regulated network monopolies requiring additional regulation to be produced. Therefore within the Indian market a cyclical production of regulation has emerged. The following sections will show how cyclical the production of regulation has been as a result of the initial incomplete production of regulation by the ex-ante branches SERCs. For this purpose we will observe 10

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<sup>28</sup> Government of India Ministry of Power, National Electricity Policy, 2005, [http://www.powermin.nic.in/indian\\_electricity\\_scenario/national\\_electricity\\_policy.htm](http://www.powermin.nic.in/indian_electricity_scenario/national_electricity_policy.htm)

<sup>29</sup> Government of India- Ministry of Power, National Tariff Policy, 2006

<sup>30</sup> “Sec. 3. (1) The Central Government shall, from time to time, prepare the national electricity policy and tariff policy, in consultation with the State Governments and the Authority for development of the power system based on optimal utilization of resources such as coal, natural gas, nuclear substances or materials, hydro and renewable sources of energy”.

Indian local States that have produced regulation that we can compare, range and confront for the analytical frame.

Additionally, the broad powers of the local ex-ante and ex-post branches of SERCs were highlighted in the judgment given by high level “Appellate Tribunal for Electricity” in *M/s Polyplex Corporation Limited V/s. Uttaranchal Power Corporation Limited and Other* in 2007. Local ex-ante branches (administrative and legislative) and local ex-post branches functions include Sec. 86 (1) (e) promotion of RES, Section 61, 86(1) (a) (i) and (h)

<p><b>Local ex-ante Branches Administrative Functions</b></p>	<p>Administrative Functions: Sub-clauses ...86 (i) (e) ...of Sub-section:  “ Sub-clause (e) mandates the Commission to promote co-generation and generation of electricity from renewable sources of energy by providing suitable measures for connectivity with the grid and sale of electricity to any person, and to specify for purchase of electricity from such sources, a percentage of the total consumption of electricity in the area of a distribution licensee.”</p>
<p><b>Local legislative Functions</b></p>	<p><b>Quasi Legislative Functions:</b> Section 61, 86(1) (a) (i) and (h) confer quasi- Legislative powers on the State Commission.  .....(a) Sub-clause (a) requires the State Commission to determine the tariff for generation, supply, transmission and wheeling of electricity, wholesale, bulk or retail, as the case may be, within the state.  Under Section 61 of the Act, the Commission is required to formulate the terms and conditions for determination of tariff.  Under Sub-clause (i) of Sub-section (1) of Section 86 of the Act, the Commission is mandated to specify standards with respect to quality, continuity and reliability of service by the licensees.</p>
<p><b>Local ex-post Branch functions</b></p>	<p>Sub-clauses “(b), (f)...of Subsection 1 of Section 86.  (ii) Sub-clause (b) empowers the Commission to regulate electricity purchase and procurement process of distribution licensees including the price at which electricity is to be procured from the generating companies or licensees or from other sources through agreements for purchase of power for distribution and supply within the state.<sup>31</sup>    (iii) Sub-clause (f) empowers the State Commission to adjudicate upon the disputes between the licensees and generating companies and to refer any dispute for arbitration.</p>

On the other hand, the Appellate Tribunal for Electricity (or the higher ex-post) has the following powers. Sec 120 (2) of the Indian Electricity Act “*The Appellate Tribunal shall have,...., the same powers as are vested in a civil court....*”.. “(5) *All proceedings before the Appellate Tribunal shall be deemed to be judicial proceedings...*” with Sec. 121 “*The Chairperson of the Appellate*

<sup>31</sup> In the Union of India Vs Cynamide India Ltd.’s case was quoted by the ATE “...the dispute was regarding the price fixation of drugs under the Essential Commodities Act and the Price Control Order issued thereunder. The Supreme Court observed that "price fixation is neither the function nor forte of the court". It was also held therein that "legislative action, plenary or subordinate, is not subject to rules of natural justice." Thirdly, it was observed that price fixation was ordinarily a legislative activity though occasionally it may assume administrative or quasi judicial character.”

*Tribunal shall exercise general power of superintendance and control over the Appropriate Commission.”*

### **Stage 1 – Local ex-ante branch of the SERC produces initial detailed regulation to handle the transformation**

In stage one, the local ex-ante branch of the SERC handles the transformation by producing applied regulation in the form of credible commitment by crafting safeguards. To analyze the situation, our “several stage” analytical framework given in the theoretical section [namely transition provisions, screening activities, safeguards, additional provisions (renewable portfolio)] is used. Transition provisions are necessary as Sec (86) (1) (e) supersedes the Federal guidelines of 1994. In 1994, a decision was taken by the Ministry of New and Renewable Energy to promote RES through a fixed tariff regime for RES. In this connection, the federal government has issued tariff guidelines with incentives provision to all the local States in India to enable the regulated network monopolies to purchase of energy from RES<sup>32</sup>. As a result, SERCs are also mandated to provide transition provisions when moving to the new regulatory regime and also give renewable portfolio to force distribution companies to purchase RES.

If one SERC's initial production of regulation does not fit the four stage analysis, this will lead to incompleteness and further production of regulation at the local ex-post branch of the SERC or Appellate Tribunal for Electricity for that particular SERC. In this context, we undertake analysis of tariff orders of 7 SERCs made by the local ex-ante branches which will allow us to highlight the initial incomplete production of regulation for a new market as a result of bounded rationality.

On analysis of tariff orders of 7 SERCs (Table – 1) within the analytical framework reveal that none of the SERCs have undertaken any screening activities (-). This could lead to misinterpretation of provisions of the Act and power purchase agreements, wrong financial and technical parameters being given to arrive at the price of RES etc. Additionally, the Chhattisgarh ERC, Karnataka ERC and Orissa ERC did not give adequate safeguard provisions which could lead to potential breakdown in long term contracts. On the other hand, Andhra Pradesh ERC and Orissa ERC did not give transition provision for RES generator in the previous regime to allow

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<sup>32</sup> 1) Rs. 2.25 per kWh for the base year of 1994-95, 2) Escalated at 5% per annum for the first ten years, 3) For the subsequent three years (11th to 13th), there would be no tariff escalation, 4) For the next seven years, the tariff would be escalated at 5% per annum, 5) Wheeling of power by the regulated network monopoly at a charge of 2% of the power 6) Open access sale of power (this is otherwise called as third party sales, Banking of Electricity - upto one year.



them switch over smoothly to the Act. With regard to renewable portfolio, Chhattisgarh ERC gave a partial order in which distribution companies without any RES plants nearby can seek exemption to purchase. As a result, the incomplete tariff orders have led to breakdown in power purchase agreements and disputes over pricing of RES. As a result the SERCs placed in the table will go through a cyclical production of regulation.

SERCs		Transition Provisions	Screening Activities	Safeguards	Renewable Portfolio
Maharashtra ERC	In the matter of Application filed..for Procurement of Wind Energy & Wheeling for Third Party Sale and/or Self Use, 2003 Purchase of Power from Bagasse based Co-generation Projects. 2001	Transition provision were given only for wind projects as they were commissioned before 2003 <sup>33</sup> . (Commissioned before 1999/ Between 1999-2003 After 2003)	Screening activities had a narrow focus. It was conducted only to arrive at the price. E.g Bagasse co-generation order <sup>34</sup> .	Common safeguards were given in the form of letter of credit	Distribution licensee to purchase 3 – 6% between 2005-2010
		+	-	+	+
Tamil Nadu ERC	Power purchase and allied issues in respect of Non-Conventional Energy Sources based Generating Plants and Non-Conventional Energy Sources based Co-Generation Plants dated 15-5-2006	Transition Provisions are given for all technologies. e.g. <i>“Wind power projects Commissioned, and to be commissioned based on agreements executed prior to the date of this order....wind power projects to be commissioned based on future agreements after the date of this order.”</i>	Screening Activities were not conducted	Safeguard provision were given in the form of bank securities.	Renewable portfolio was given at 10% of the total energy
		+	-	+	+

<sup>33</sup> In the matter of Application filed by Maharashtra State Electricity Board (MSEB), (II) Shri Pratap G.Hogade, (III) Renewable Energy Developers Association of Maharashtra (REDAM) and Indian Wind Energy Association (InWEA) for Procurement of Wind Energy & Wheeling for Third Party Sale and/or Self Use, 2003

<sup>34</sup> Purchase of Power from Bagasse based Co-generation Projects and in the matter of aiding the State Government in formulation of Policy, 2001 “Summary of Consultant’s Report and Expert’s Comments on Key Issues” included “2.01 Summary of TERI Report – Key Issues...2.02 Summary of BITS Report.. 2.03 Summary of Expert Comments from Shri Shriram Madhukar Sane ...2.04 Summary of Expert Comments from Shri Dilip Kumar Dutt”

Karnataka ERC	“In the matter of Determination of Tariff in respect of Renewable Sources of Energy” in 2005	Stated in its Tariff order this “this present order is limited to determination of new projects”	No screening activities were conducted	No Safeguard provisions were given. Left to the parties to decide	Renewable portfolio minimum quantum of 5% and a maximum quantum of 10%” for purchase
		+	-	-	+
Madhya Pradesh ERC	In the matter of procurement of wind energy dated 2004, 2006 & 2007 Tariff Order for Procurement of Power by Distribution Licensees from Small Hydro Based Generation, 30th June 2008	Elaborate Transition provision are given.	No screening activities conducted	Safeguards in the form of deadline for settlement and interest rate on delay in payment.	Renewable portfolio was given at 10% purchase by distribution companies.
		+	-	+	+
Chhattisgarh ERC	In the matter of determination of tariff and related dispensation for procurement of power from biomass-based generation projects. Petition No. 7 of 2005	Partial Transition provisions - two RES plants operational at the time of the tariff order. No banking or open access	No Screening Activities conducted	No Safeguard provisions given. “matter should be resolved through bilateral agreement	Partial Renewable obligation. 5% can be purchase. But distribution cos with no biomass plants nearby can seek exemption.
		-	-	-	-
Andhra Pradesh ERC	Purchase of Power from Non-Conventional Energy Projects. Dated March 20, 2004	No transition provision	No screening activities conducted	Safeguard measure in the Form of letter of credit	Renewable portfolio: 5% to be purchased. .5% of total consumption for wind.
		-	-	+	+
Orissa ERC	M/s Greenpeace India Society V/s Energy Secretary, Govt. of Orissa, Bhubaneswar in 2004	No transition provisions	No screening activities	No safeguard	Renewable Portfolio: 3% with .5% increase to reach 5% in 2011-12
		-	-	-	+

## **Stage -2 Local “ex-post” branch of SERC producing regulation by Gap-Filling**

In stage 2, the local ex-post branches of SERCs engage in gap-filling to adjudicate upon disputes between open utilities, generators and local ex-ante branch of SERCs over incomplete regulation in tariff orders and power purchase agreements. The local ex-post branches of SERCs have produced both bounded rationality and opportunism based gap filling to overcome the hazards of incomplete regulation occurring in stage-1.

The cases displayed in Table -2 highlights gap filling approach of the local ex-post branches of SERCs. Local ex-post branch of Maharashtra ERC provided gap-filling measures for completing policies of State Government of Maharashtra which created hold-ups for the RES generators. Local ex-post branch of Karnataka ERC provides opportunism based gap-filling regulation to overcome lack of safeguard provisions in Stage -1 of the tariff order which lead to opportunistic behavior on the part of regulated network monopoly. Local ex-post branch of Andhra Pradesh ERC uses opportunism based gap filling to complete the incentive provisions in the tariff order. The incomplete tariff order allowed RES generators to behave opportunistically and create hazards by cutting down forest land which affected the environment. Local ex-post branch of Tamilnadu ERC applied bounded rationality gap-filling in interpreting the various sections of the Act as well as rectifying internal policies of the regulated network monopoly. In stage -1, local ex-ante branch of Madhya Pradesh ERC had not done screening activities for the tariff order which resulted in erosion of financial viability of the RES plants. Thereafter, the ex-post branch of Madhya Pradesh did gap filling through negotiated bargaining and this resulted in higher pricing for RES.

The litigation do not stop here as most of the gap-filling given by the local ex-post branch of SERCs did not satisfy the RES generators and/or regulated network monopolies. In addition, cases pertaining to tariff relook and market arrangements by way of open access were dismissed at the local ex-post branch of SERC. This forced the market players to change the forum and approach the Appellate Tribunal for Electricity (ATE) or higher ex-post for reviewing the tariff orders and power purchase agreements.

<b>Table – 2. Ex-post Branch of SERCs making Gap-Filling regulation</b>				
<b>Local Ex-post branch of SERCs</b>	<b>Case</b>	<b>Incompleteness</b>	<b>Hazards</b>	<b>Additional Production of regulation or Safeguard</b>
Maharashtra ERC	M/s. Dodson-Lindblom Hydro Power Private Limited of 2006	The local State government of Maharashtra had stated the distribution licensee should have right of first refusal in purchasing electricity from RES only then can open access provisions be allowed.	Creates a hold up and stifled competition as it goes against Sec 10(2) of the act says that “(2) A generating company may supply electricity to any licensee in accordance with this Act....., supply electricity to any consumer.”	The policy was a “ <i>Error apparent on the face of record</i> ” and allowed RES generators to supply electricity to any licensee and through open access.
Karnataka ERC	M/s Enercon India Ltd Vs KPTCL of 2003	Delay in payment of energy fed into the grid by the distribution licensee and delay in finalizing power purchase agreements	Loss in investments and non repayment of loans taken as the RES generators invested huge sum for erection of these power plants.	To finalize the PPAs three months from the date of this order and making payments
	M/s Poweronics Ltd. Vs KPTCL dated 2007 case	Valid power purchase agreement was unilaterally terminated by the transmission company	Abuse of monopoly status.  Created financial loss on the part of the RES Generator who had borrowed money.	‘..to terminate the PPA has been taken in a casual and arbitrary manner without absolutely any reason for the said termination” Gave directions for payment for the parties
Andhra Pradesh ERC	“Power Order on purchase of power from NCE projects issued. RP No. 84 of 2003 in OP No. 1075 of 2000”	Favourable incentive provisions were used by RES generators to setup generating plants and to produce higher volume of electricity.  Bounded rationality by the Local state government in giving sanctions.	Andhra Pradesh had “...generating capacity of only 225 MW on a sustained basis, sanctions for Biomass plants have been given for about 410 MW.”. RES generators used the situation opportunistically to produce higher volume of electricity by cutting down forestland - causing damage to the environment. On the other hand the fuel cost of biomass had shot up.	“...not permit purchase of power from new Biomass power projects other than those already sanctioned... This will be reviewed after three years.”
	M/s. Jocil Limited Vs M/s Southern Power Distribution Company of AP Ltd (APDISCOM) dated 2007	RES generator wanted to sell power in addition to the existing 2.4 MW already being sold to the regulated network monopoly.  The Andhra Pradesh ERC gave a general statement “to purchase the surplus power delivered by the petitioner herein and make payments”.	Given such a broad statement as to purchase 'surplus power', RES generator claimed payment more than it actually sold while on the other hand Distribution Company paid for less than the amount purchased.	Fixed limits on the purchase & “arrears will charged according to variable costs” and directed to pay within four weeks or with interest @ 10% per annum thereafter.

Tamil Nadu ERC	M/s KTV Oil mills Ltd Vs TNEB case no. M.P No. 2/07 dated 05.02.2008	Vertically integrated Tamil Nadu Electricity Board (TNEB) had a problem with interpreting the terms ‘wheeling’ and ‘transmitting’ in the Indian Electricity Act where it charged a RES – wind energy generator “5% wheeling charges on gross generation of electricity” <sup>35</sup>	The hazard was that this led to the distribution company charging for energy supplied both to the grid and also for captive consumption.	<i>The wheeling charges are to be paid only for the use of the transmission facility of the respondent board for the conveyance of electricity fed into the grid of the respondent board for captive use and not for the entire energy generated”.</i>  Therefore transmission of electricity to the Regulated network monopoly there was no charge
	M/s. Global Polybags Industries (P) Ltd Vs Tamil Nadu Electricity Board (TNEB) of 2007	State electricity monopoly stated that there was a one year waiting period for RES generator before switching to open access while the same provision is not mentioned in the contract	The hazard was that such internal policies created administrative hold-up for the RES generator to compete in the market.	<i>“one year rule is neither based on the policy of TNEB nor in accordance with statutory provision of law.... in Sections 9 and 10 of the Electricity Act 2003”</i>
Madhya Pradesh ERC	“Review of Commission's order dated 11/06/2004 for procurement of wind energy”	Recalculation of tariff: The screening activity of of the local ex-ante branch of Madhya Pradesh ERC with regard to the financial parameters of the tariff was not sufficient.  Some of the financial parameters in question were debt repayment obligation, depreciation provision, dividend income from the generating plant etc.	Wrong percentages within the financial parameters created the hazard of eroding the financial viability and profitability of the plant over its life time.	Madhya Pradesh ERC modified and frontloaded the existing tariffs of Rs. 2.87 by raising it from Rs. 3.97 and declining it to Rs. 3.30 in subsequent years.

<sup>35</sup> “Section 2(76) “wheeling” means the operation whereby the distribution system and associated facilities of a transmission licensee or distribution licensee, as the case may be, are used by another person for the conveyance of electricity on payment of charges to be determined under section 62.

Section 2(74) transmit” means conveyance of electricity by means of transmission lines and the expression “transmission” shall be construed accordingly.”

### **Stage 3 Appellate Tribunal for Electricity (ATE) reviewing SERCs decisions to impose its core strategic Preference**

In this section we will demonstrate that higher ex-post or the ATE provide safeguards or additional regulation by reviewing the decision of the SERCS in the local states. By doing so, ATE provides additional regulation to rectify the incomplete tariff orders and power purchase agreements mediated by SERCs by using the hard look review and imposing strategic preferences. The contested tariff orders and power purchase agreements were not only given a hard look review by the ATE but also gap filling measures were performed.

Using the hard look review to its advantage, the ATE then imposed its strategic preference on the local SERCs in all the RES cases. We find that Andhra Pradesh ERC had misused its powers as it did not give transition provisions in the tariff orders to accommodate the existing RES generators in the new regime. This led to loss of investments on the part of the open access generators. The ATE imposed its strategic preference by striking down the tariff order and restoring credible commitment. Andhra Pradesh ERC had also used a wrong methodology in calculating open access cross subsidy surcharge thereby making it burdensome for open access consumers to purchase. ATE directed the SERC to follow the methodology in the National Pricing Policy. In another case, Andhra Pradesh ERC displayed bounded rationality in giving incomplete incentives which led to RES generators behaving opportunistically by pumping more electricity than contracted for and demanding payment from the distribution companies. The ATE put a safeguard of upto 100% PLF can be sent to the grid. Chhattisgarh ERC tariff order was given a hard look review as it did not give 1) transitions provision such as banking of electricity, 2) incomplete renewable portfolio (stage 1) and 3) incomplete power purchase agreement. This injected uncertainty into the power purchase agreement while distribution companies can wriggle their way out of the purchasing due to the incomplete renewable portfolio. ATE rectified and imposed its strategic preference by making reinstating banking provisions and stopped potential ‘tinkering’ of power purchase agreements Tamil Nadu ERC gave a capricious tariff order due to wrong methodology in calculating tariff. This is due to lack of screening activities leading to lower tariff for RES generators. ATE rectified the same by observing practice of SERCs. In the case of Orissa ERC, the ATE observed that tariff set was not in accordance with the law and imposed upon the SERC to follow the proper rules and procedures. The lacks of screening activities in Karnataka ERC lead to contest bargaining or haggling situation. Using its authority, ATE ended the bargaining process by imposing its strategic preferences on the pricing process.

**TABLE – 3 - 3 Higher Ex-post - Appellate Tribunal for Electricity (ATE) reviewing SERCs decisions to impose Strategic Preference**

States	Case	Incompleteness	Hazard	Additional regulation/Safeguard
Andhra Pradesh ERC	Small Hydro Power Developers Association and Others Vs. Andhra Pradesh Electricity Regulatory Commission and Others in 02.06.2006	Misuse of power: No transition provisions given in the tariff orders at the local ex-ante branch- earlier pricing provision was canceled while open access which was previously available was stopped. Moreover, The SERC stated that <i>“Developers of non-conventional energy shall supply power generated to APTRANSCO/DISCOMS of A.P. only;”</i>	The above actions created loss of income and investments leading to non-repayment of loans.	<i>“It is not within the jurisdiction or scope of powers ... to review or examine the policy direction issued by the State Government.”</i>
	RVK Energy Pvt. Ltd.V/s. Central Power Distribution Co. and others dated July 05, 2007,	Wrong methodology for computing the surcharge and the additional surcharge or transition charges payable by the open access consumers	Resulted in high price of electricity. Difficult for the private entrepreneurs to set up generating stations and consumers to pay for it.	<i>“...to compute the cross subsidy surcharge, ....in accordance with the Surcharge Formula given in para 8.5 of the Tariff Policy, for the year 2006-07 and for subsequent years.”</i>
	Ritwik energy Systems Vs Andhra Pradesh Transmission Company of 2006	Incompleteness in the incentive scheme within the tariff order <sup>36</sup> and Power purchase agreement  Provision stated <i>“...variable cost indicated above and incentive of 21.5 paise /unit ...above shall be paid for every unit delivered in excess of the 55% PLF”</i>	RES generators opportunistically delivering energy at more than 100% Plant Load Factor (PLF) of the contracted quantity to the regulated network monopoly.  This caused ambiguity as to sale and purchase and fixation of quantities between open utility and regulated network monopoly.	<i>“...is directed to calculate PLF on monthly basis to arrive at the purchasable energy limiting to 100% PLF after deducting auxiliary and captive consumption.”</i>

<sup>36</sup> “In the Matter of Transmission Corporation of Andhra Pradesh (APTRANSCO) R.P.No.84 / 2003 in O.P.No.1075 / 2000, for Purchase of Power from Non-Conventional Energy Projects. Dated March 20, 2004”



<p><b>Chhattisgarh SERC</b></p>	<p>Chhattisgarh Biomass Energy Developers Association &amp; Others...</p> <p>Vs.</p> <p>Chhattisgarh State Electricity Regulatory Commission &amp; Others 2005</p>	<p>Hard look review: Incomplete transition provisions i.e. banking facility and renewable portfolio was incomplete.</p> <p>Incompleteness in the Power Purchase Agreements (PPA) which stated that, “any change, modification, deletions, additions etc in the policy of State Government ... shall be acceptable to the owner of the plant and the incentives under the present Scheme should stand modified”.</p>	<p>Clause negates such agreements to be of bi-lateral nature between equal parties and injects uncertainties about the finality of the terms and conditions of agreements.</p> <p>The hazard of the incomplete renewable portfolio was that the distribution companies can wriggle their way out the obligation to purchase RES.</p>	<p><i>The ATE reinstated provisions for banking of electricity and rectified the incomplete renewable portfolio.</i></p> <p><i>ATE rectified the uncertainty created by the clause in the PPAs by stating that PPAs cannot be ‘tinkered’ and modified when the agreements are one sided.</i></p>
<p><b>Tamil Nadu ERC</b></p>	<p>Wind Power Producers Association vs. Union of India &amp; Tamil Nadu Electricity Regulatory Commission, 2007</p>	<p>Capricious tariff order: Incompleteness in pricing methodology.</p> <p>Local ex-ante branch of Tamil Nadu ERC has computed Tariff or pricing on the “basis of simple average rather than time value of money”.</p>	<p>This led to lower tariff rates and profits for wind energy producers in Tamil Nadu amounting to Rs. 2.74 per unit over the next twenty years.</p>	<p><i>“..it is not sufficient that tariff is higher than cost....If Time value for money had been used then the tariffs would have been much higher” and advised the SERC to follow other states such as Gujarat ERC and Rajasthan ERC who have used levelized costs.</i></p>
<p><b>Orissa ERC</b></p>	<p>Sri Avantika Power Projects Pvt. Ltd. Versus Orissa Electricity Regulatory Commission and others in August 2006</p>	<p>Not in Accordance with the law: Did not engage in negotiated rate hearing process to make the tariff order.</p> <p>Or in accordance with the provision of the Indian electricity Act.</p>	<p>The investor became confused as to the actual pricing policy of the state and the process of entering into power purchase agreement.</p>	<p><i>“issue notice to the utility and in terms of Section 86(1)(e) and all other relevant provisions, pass appropriate orders...” by further stating that the Orissa ERC, “has not exercised the jurisdiction vested in it”</i></p>
<p><b>Karnataka ERC</b></p>	<p>South Indian Sugars Mills Association (Karnataka) Vs Karnataka Electricity Regulatory Commission (KERC) of 2007</p>	<p>Ending the bargaining process: Rate hearing or bargaining process to arrive at the tariff by negotiating with interest groups, open utilities and regulated network monopolies created contentious issues for technical and financial parameters</p>	<p>Karnataka ERC had been “...handicapped by any study .....for cogeneration plants” as a result it arrived at wrong parameters for the tariff given to the SERC through the market participants.</p>	<p><i>“...it will be appropriate to go by the figure given by KREDL who are a nodal agency in Karnataka for development of renewable energy sources and are not an affected party ....”</i></p>

#### Stage – 4 Local ex-ante branches of SERCs imitating to produce regulation

Given the M-form federalism in India, SERCs imitate each other using time inconsistencies in formulating tariff orders. The cooperative nature<sup>37</sup> of the Indian federal system allows SERCs to give orders at their own pace. This sets forth a pattern of sequential imitation of regulation that can be analyzed when SERCs arrive at the technical and financial parameters of tariff orders i.e. early movers, midterm entrants and late movers. In doing so, SERCs arrive at tariff orders and provide initial production of regulation with safeguards to get over the incompleteness of broad law. Using the analytical steps, SERCs are placed in their respective places in table - 3. Selective examples are being used to highlight the imitative production of regulation.

**Table -3 - Classification of imitating SERCs**

	<b>Imitating SERCs</b>	<b>Year issued</b>
First Regulatory Movers 2001-2005	1. Maharashtra ERC 2. Andhra Pradesh ERC 3. Uttar Pradesh ERC 4. Madhya Pradesh ERC 5. Karnataka ERC	2001 2004 2001 2004 2005
Midterm Regulatory Entrants 2005-2006	6. Rajasthan ERC 7. Tamil Nadu ERC 8. Gujarat ERC 9. Uttar Pradesh ERC 10. Chhattisgarh ERC	2005 2006 2006 2005 2005
Late Regulatory Movers 2006 – onwards	11. Haryana ERC 12. Punjab ERC 13. Madhya Pradesh ERC	2007 2007 2008

#### First Regulatory Movers 2001-2005

The first movers are local ex-ante branches of SERCs who are the primary entrants in the federal regulatory arena to produce on their own regulation. In this context, local ex-ante branches of SERCs identified as first movers are Maharashtra ERC, Andhra Pradesh ERC, Uttar Pradesh ERC, Madhya Pradesh ERC and Karnataka. These local ex-ante branches of SERCs have not imitated other local ex-ante branch and have sought to develop their own methodological approach.

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<sup>37</sup> India follows cooperative federalism that is seen in the Constitution of India which places electricity in the Concurrent list. This means that electricity generation, transmission and distribution is the shared responsibility of both the federal and state governments.

**Section Details** Schedule VII (Article 246) of the Constitution enumerates the Concurrent list 17A. Forests.

21. Commercial and industrial monopolies, combines and trusts.

38. Electricity.

**i.Maharashtra ERC**

The local ex-ante branch of the Maharashtra ERC in its “Order for Non-Fossil Fuel based Co-generation Projects” in 2001 and “Order on Wind Energy” in 2002 has stated that “*The Commission is aware that the easiest path would be to accept the MNES guidelines in toto, and declare the purchase rate accordingly. The Commission, however, did not pursue this option, and undertook a comprehensive review and the public process, in order to determine the tariff for these projects, as well as the principles of EPA for bagasse based co-generation plants....*” (MNES refers to the Ministry of New and Renewable Energy, EPA refers to the Energy Purchase Agreement)

**ii. Andhra Pradesh ERC**

In the case of local ex-ante branch of Andhra Pradesh ERC, it sought to give its own tariff orders on two occasions in 2001 and 2003 with modifications to the Ministry of New and Renewable Energy orders without imitating any other local ex-ante branch of SERC. It passed the tariff order for RES based on suo-moto hearing.

**iii. Karnataka ERC:** Karnataka is already mentioned in stage 1.

**B. Mid Term Regulatory Entrants (2005-2007):**

These local ex-branches of SERCs sought to produce regulation by imitating financial and technical parameters of first regulatory movers. This is seen from the case of Tamil Nadu ERC, Chhattisgarh ERC and Gujarat ERC is taken as example of mid-term regulatory entrants.

**i. Tamil Nadu ERC:** The local ex-ante branch of Tamil Nadu ERC ‘In the matter of: Power purchase and allied issues in respect of Non-Conventional Energy Sources based Generating Plants and Non-Conventional Energy Sources based Co-Generation Plants’ dated May 2006

<p>“Issue No. 6 : <b>Banking</b> :.... Orders of other commission on banking Charges. Banking has been permitted in almost in all the states. MNES prescribes a banking period up to one year.</p>	<p><b>Other States</b> Banking period •Madhya Pradesh, Andhra, Karnataka, Maharashtra &amp; Rajasthan = 12 months •Kerala, Gujarat &amp; West Bengal = 6 months Banking charges •Madhya Pradesh, Andhra, Karnataka &amp; Rajasthan = 2%</p>	<p><b>Commission’s Views / Decisions</b> As followed by most of the other States, the Commission retains the existing practice of one year (from April to March) banking period of TNEB, for the NCES based wind electric generators who are feeding “infirm power” to the grid.”</p>
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**ii. Chhattisgarh ERC**

Chhattisgarh ERC imitated its tariff order from other states. The biomass pricing order of 2005 illustrates the same, it states that *“the commission has also gone through the orders of other states....such as Andhra Pradesh, Karnataka, Maharashtra....the commission has had the benefit of these orders and directions and this order generally follows the principle adopted in these orders”*.

### **iii. Gujarat ERC**

In the matter of: Determination of price for procurement of power by the Distribution Licensees in Gujarat from Wind Energy Projects” issued in 2006, the local ex-ante branch of Gujarat ERC imitated by broadly referring to the SERCs. For example in the financial parameter for *“5. Capital cost of project....., the Commission found that there is a wide variation in the project cost estimated by different stakeholders ranging from Rs. 3.5 Crores to Rs. 5.5 Crores per MW. Based.....the levels of capital cost as estimated by other State Regulatory Commissions, the Commission has decided that Rs. 4.65 Crores ...reasonable estimate for capital cost for 1 MW project.”*

### **C. Late regulatory movers (2007 onwards)**

The late regulatory movers are local ex-ante branches of SERCs who produce regulation after they have had time to learn from experiences of other SERCs and cases at the higher ex-post or Appellate Tribunal for Electricity which help them to frame tariff orders.

#### **i.Madhya Pradesh ERC**

Local ex-ante branch of Madhya Pradesh ERC issued a tariff order for biomass in 2008 imitated from other states and also draws on experiences through litigation of other SERCs at ATE level. For example it cited the order issued in ATE Case of Chhattisgarh Biomass power developers of 2005 (stage -3) to imitate a financial parameter *“7.22 Appellate Tribunal for Electricity had stated in Chhattisgarh case that an escalation at 5% p.a. be provided....”*

#### **ii.Punjab ERC**

‘In the matter of Implementation of Govt. of Punjab directive issued under Section 108 of the Electricity Act, 2003 for compliance of the New & Renewable Sources of Energy (NRSE) Policy, 2006’ the local ex-ante branch of Punjab ERC produced an interim tariff order - by looking at the experience of different tariffs of SERCs before deciding on an appropriate one. The Punjab ERC stated that it *‘...has taken note of rates fixed in adjoining states.....in the case of Karnataka,*

*Maharashtra and Andhra Pradesh were fixed a while ago.....it is more relevant to take into account the rates... in Punjab's neighbourhood. Looking at the rates as fixed in Haryana and Uttar Pradesh, it is seen that the lowest rates are for hydel power and these are marginally more than the rates proposed by the Government of Punjab. '*

### **iii. Haryana ERC**

Local ex-ante branch of Haryana ERC learned from experience of other SERCs that pricing and incentives are the most contentious issues. To avoid the controversy of litigation with relation to both its RES price is higher than the national average. In addition, incentives were also given in on 'Renewable Energy Tariff & Other Issues For FY 2007-08 To FY 2012-13' which reflected through experience.

*'Banking: The banking facilities shall be allowed anytime of the day....'*

*'Grid Connectivity: The state Transmission utility/distribution licensee will bear the cost of...transmission line upto 10 km....beyond the transmission line shall be shared equally'*

*The following Tariffs were given for 20 year period 1) wind - Rs. 4.08 with 1.5% escalation, 2) Mini-hydel- 3.67 with 1.5% escalation 3), biomass - Rs. 4.00 with 2% escalation'. These are much higher tariffs than prescribed by other local ex-ante branches SERCs - as seen in Madhya Pradesh ERC in stage 2. The next stage will look at the new production of regulation by the Indian electricity regulator which comes about as a result of substantial environment changes.*

### **Stage 5: ATE and Government of India changes the Institutional environment of rule production for SERCs**

The ATE imposed its strategic preference on the SERCs by directing the Karnataka Electricity Regulatory Commission through the case South India Sugar Mills Association (SISMA) Vs KERC and Others (2007) has directed the SERCs ".....For future, procurement of power based on renewable energy sources shall be through competitive bidding process...". The ATE has set the mandate for SERCs to move away from cost plus tariff to competitive bidding. As a result, the local ex-ante branch of SERCs have to develop new rules for the RES market thus bring about another cyclical production of regulation.

On the other hand, the federal ministry in charge of renewable energy - Ministry of New and Renewable Energy (MNRES) looks set to change in the institutional arrangement of RES development by switching to inter state Renewable Energy Certificates development. The federal ministry has noticed saturated growth of RES in certain states such as Tamil Nadu, Karnataka and

Maharashtra while in the states such as Kerala, Orissa, Madhya Pradesh, are yet to exploit RES to its full potential. In a recent paper “Request for Proposal in July 2008<sup>38</sup>”, the Ministry of New and Renewable Energy (MNRES) has asked for detailed study for developing Renewable Energy Certificates (REC) to be traded among states. According to the proposal,

<i>Incompleteness</i>	<i>Hazard</i>	<i>Additional Production/innovation</i>
<i>.. RE potential is State and site-specific, leading to a mismatch in Renewable Portfolio Obligations .....availability in the country....Tamil Nadu and Karnataka have already approached the 10% mark for Renewable Energy (RE) procurement, many States are not procuring even 1% of their requirement through RE sources.... States with zero/very low RE potential are not able to procure RE generation from RE rich States.</i>	<i>b. It is not possible to carry out inter-State renewable energy purchase transaction using existing Regulations as renewable energy loses its green/renewable nature as soon as it crosses the State boundary.....”</i>	<i>As a result, it is considered desirable to create mechanism to which will enable inter-state sales of renewable power.....development of ‘Renewable Energy Certificate’ (REC) mechanism.</i>

This will bring about a cyclical production of new regulation for developing the RES market at a regional and national level.

#### Conclusion

In this article we explained and demonstrated the existence of a cyclical production of regulation when a boundedly rational federal regulatory structure is given a task by incomplete federal law. We then exemplified this with the support to renewable energy in electricity industries. The federal regulatory structure mimics the technical and structural properties of electricity which combines global (federal) effects with more local ones. It results in a regulatory structure with different branches linked through separation of powers. We highlighted that the production of incomplete regulation is made by local ex-ante branches dealing with transformation, deregulation, fixing prices and developing power purchase agreement while being submitted to hazards and bounded rationality. Given that the local ex-post branch or higher ex-post branch will use its powers to remedy the regulatory incompleteness that process will result in a cyclical production of regulation consisting of five stages of 1) local ex-ante, 2) local ex-post, 3) higher ex-post, 4) local imitation and 5) local or higher innovation.

<sup>38</sup> Ministry of New and Renewable Energy Sources, Request for Proposal, Hiring of Consultant for ‘Development of Renewable Energy Certificate (REC), Mechanism for India’, July 2008, <http://mnes.nic.in/tenders/current/rfp-rec.pdf>

We then apply that analytical frame to India's new renewable energy policy to show how the incompleteness of Section 86 (1) (e) in the Indian Electricity Act 2003 makes the Indian electricity regulatory structure [comprising of State Electricity Regulation Commission (SERC) and Appellate Tribunal for Electricity (ATE)] go through a cyclical production of regulation. Cases, tariff orders and power purchase agreements from 10 SERCs and cases at the ATE level are used to exemplify the cyclical framework.

An extension of the cyclical production of regulation can be applied to other federal systems. The EU, the USA and Brazil can be other relevant case studies to compare various regulatory cycles occurring where electricity regulation is decentralized among local state regulators and a federal authority. It will also be interesting to see the application of the cyclical framework on other network industries such as telecommunication or water having more decentralized supervisory regulatory structures. An exciting case would be to apply this analytical framework on European energy policy (either in its “internal market” or “renewable” or “CO2 allowances” or “security of supply” areas). A paramount case could assume that regulatory imitation operates at an intercontinental perspective with relative experiences of United States, Latin America, Asia and Europe acting as referencing parameters. We already know that setting up “markets for CO2 allowances” is more and more candidate to such an analysis.

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