
ECOnirman & Third Party Assessors

Innovative Approaches to Energy Code Compliance and Enforcement in India

Prasad Vaidya

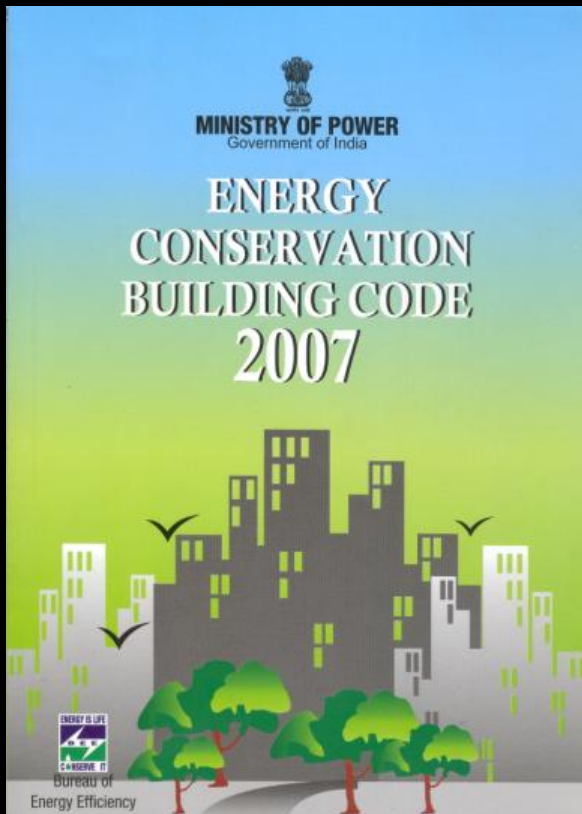
Presentation Outline

1. Background
2. EConirman – Whole Building Performance Compliance Tool
3. Third Party Assessors Framework

Background

- ▲ With 67% of the floor space for 2030 to be built in the next 18 years, a 9.9% energy shortage, and a 16.6% peak demand shortage, energy efficiency holds a huge potential.
- ▲ Buildings consume about 33% of the electricity

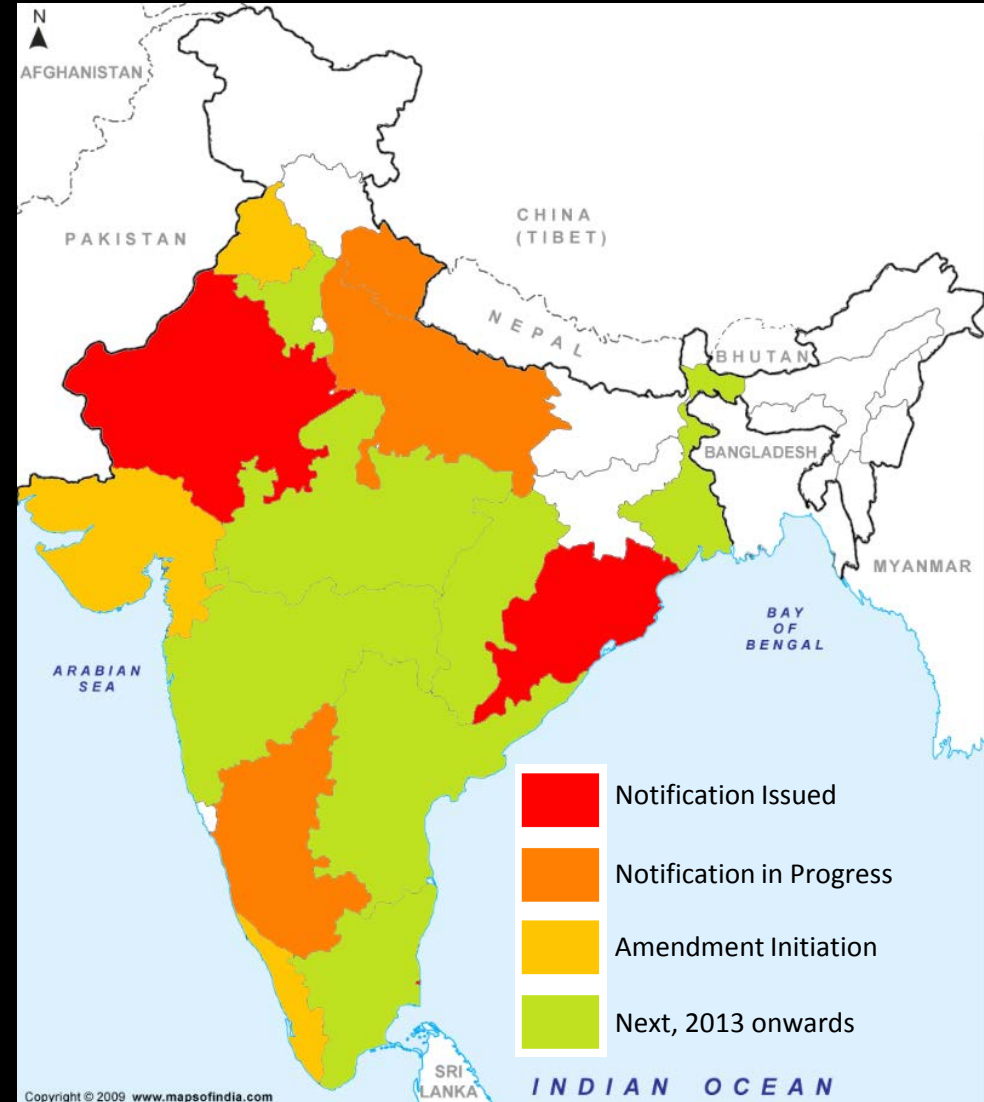
Energy Conservation Building Code



- ▲ 1.7 Billion kWh of Savings
- ▲ 12th Five Year Plan expects to have 65% compliance by 2017
- ▲ ECBC sets minimum energy efficiency standards for design and construction
- ▲ Has Prescriptive and Whole Building Performance Paths for compliance
- ▲ Includes requirements for building Envelope, HVAC, SWHP, Lighting and Electrical systems

Status of ECBC at State Level

- ▲ Notification Issued
 - ▲ Rajasthan, Odisha, & Puducherry
- ▲ Notification in progress
 - ▲ UP, Karnataka and Uttarakhand
- ▲ Amendment Initiation
 - ▲ Punjab, Kerala, Gujarat
- ▲ Next, 2013 onwards
 - ▲ MP, Haryana, Chhattisgarh, AP, Tamil Nadu, West Bengal, Maharashtra



Challenges to ECBC Compliance

▲ Adoption

- ▲ Each local government has to modify bye-laws

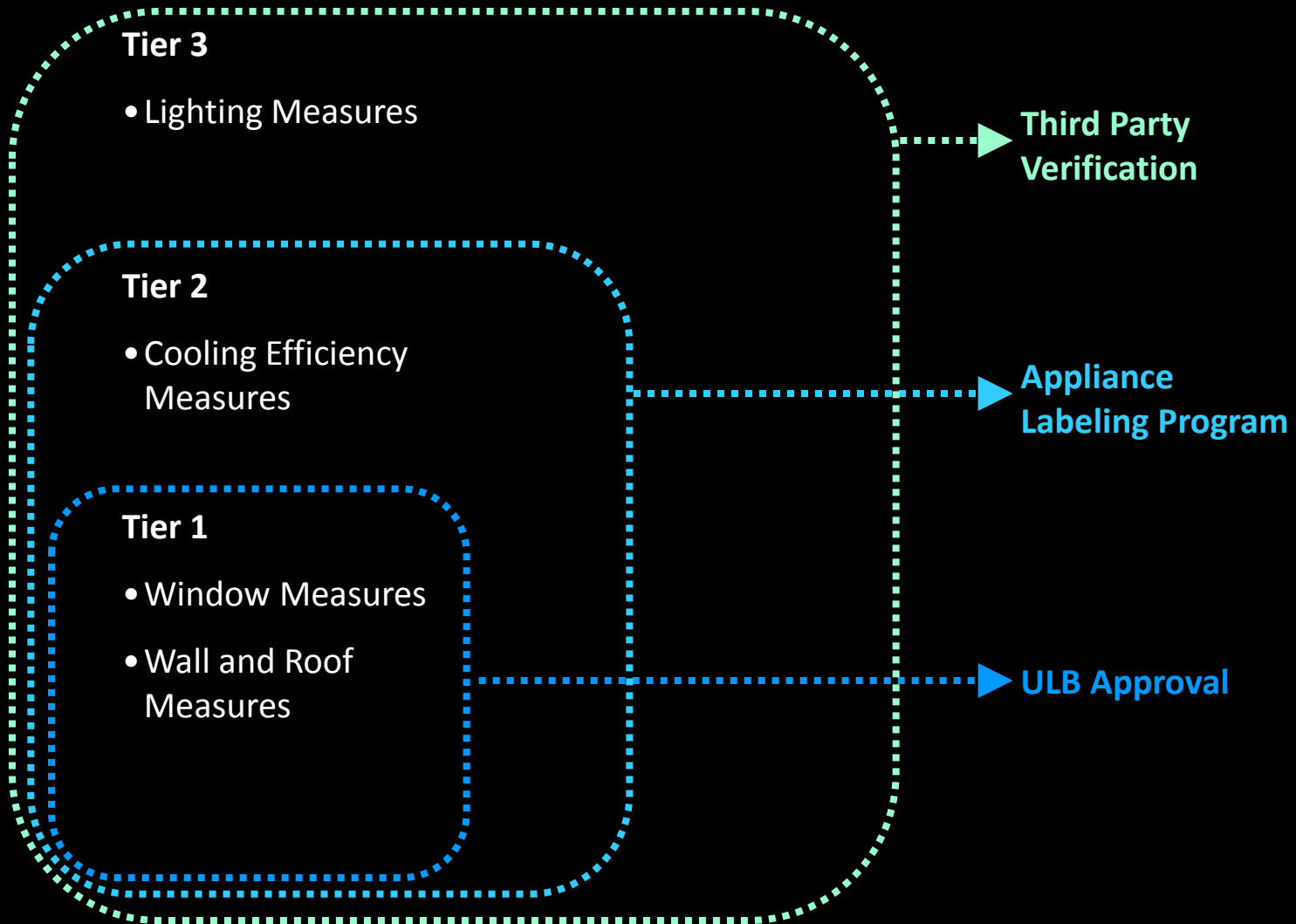
▲ Implementation

- ▲ Lack of expertise amongst architects, engineers and contractors
- ▲ Lack of third party objective testing facilities that measure product efficiency.


▲ Enforcement

- ▲ Lack of expertise and human resources at local levels
- ▲ Currently, occupancy approval does not include all building systems

Tiered Approach to ECBC




ECO nirman WBP Compliance Tool



**ENERGY CONSERVATION
BUILDING CODE (ECBC)**

Conformance Check Report
Whole Building Performance Method

1.0 Building Summary



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[Return to Project List](#)

Project: Delhi

General

Building

Assumptions

(m)

(m)

(m)

(m)

(m)

(m)

(m)

Project Information		
Project ID	ac79f95f-514a-4cc6-8be4-737230eb4786	Date: 5/31/2012
Project Name	proposed-Delhi	
Project Address		
Organization Name	TWG	
Building		
Building Type	Office	
Building Occupancy	Daytime Use	
Total Conditioned Area (m ²)	8,700	
Total Unconditioned Area (m ²)	1,300	
Total Interior Floor Area (m ²)	10,000	
Number of Floors	2	
Floor to Floor Height (m)	4	
Location		
State/UT	NCT	
City	New Delhi	
General		
Climate Zone	Composite	
Weather File	IND_New_Delhi_421820_ISHRAE	
Simulation Program	DOE2.1	
Building Conformance Summary		
Proposed Design Electricity Use per year (kWh/year)	Standard Design Electricity Use per year (kWh/year)	Percent Savings: Electricity Use per year
23,67,091	25,25,390	6.3%
Proposed Design EPI (kWh/m ² /year)	Standard Design EPI (kWh/m ² /year)	Percent Savings: EPI
237	253	6.3%
10.3.2(a) of ECBC Satisfied (Y/N)?		
Y		
Mandatory Requirements Met (Y/N)?		
Y		
Building Conformance as per the ECBC		CONFORMING

Enforcement Staff Needs

Knowledge of

- ▲ ECBC requirements and how they are installed
- ▲ Building Systems: Envelope, HVAC, SHWP, Lighting, Electrical
- ▲ Performance impact and energy calculations
- ▲ Methods for checking drawings, documentation, calculations
- ▲ Review of building energy simulation reports
- ▲ Methods for verifying installations

Third Party Assessors (TPA)

- ▲ Increasingly popular with easier scale up and scale down of capacity to handle growth
- ▲ Requires certification and qualification of TPAs

Examples of Success

- ▲ Adopted in China with 80% compliance reported.
- ▲ Local governments in Canada have used TPAs.
- ▲ Over 90% of the US State of Pennsylvania's 2,562 municipalities have enforced the code locally
- ▲ Rating systems with TPAs used in Australia (NABERS), USA (HERS)

TPA Models Researched

India

- ▲ Chartered Accountants
- ▲ Company Secretaries
- ▲ Property Assessors (valuers)
- ▲ IGBC/ LEED
- ▲ GRIHA / ADaRSH

China

- ▲ Code Compliance for Public Buildings

USA

- ▲ LEED/GBCI for all Rating Systems except LEED for Homes
- ▲ LEED/ GBCI for Homes
- ▲ EPA ENERGY STAR
- ▲ Code Compliance in Fairfax County, VA
- ▲ Code Compliance in Dayton, OH
- ▲ Code Compliance in Pittsburgh, PA
- ▲ Code Compliance in Washington, DC
- ▲ Code Compliance through use of Design Professional Accountability/Self-Certification (Wisconsin & Arizona)

Issues Researched

- ▲ Roles for entities involved
- ▲ Appointment methods for Third Parties and their fee structure
- ▲ Qualifications, credentialing, education and training requirements
- ▲ Process of review, standards of review
- ▲ Complaint resolution
- ▲ Quality Assurance process
- ▲ Penalties for non-performance

TPA Best Practices Found

- ▲ Minimize the technical role of regulatory authority
- ▲ Standardise qualification for service provider
- ▲ Remove financial conflict of interest between reviewer and reviewed
- ▲ Fair compensation for making TPA work a viable business activity for providers
- ▲ Mechanism for QA or audit of TPA work
 - ▲ Maintain quality and consistency
 - ▲ Measure effectiveness

Stakeholder Consultation

▲ Government Agencies

- ▲ BEE, MEDA, GEDA

- ▲ State PWD in Maharashtra and Rajasthan

- ▲ ULBs of Pune, Pimpri-Chinchwad, Ahmedabad, Vadodara, Surat, Jaipur

▲ Institutions

- ▲ CREDAI, MNIT, IIT, MetricTrac, Prometric

▲ Industry

- ▲ Over 30 Building Energy Efficiency Experts

Principles of TPA Model

- ▲ For ULB
 - ▲ Integrate the operation model with existing checkpoints in the building permit process
 - ▲ Maximize the capacity building outside the ULB, minimize need at ULB
 - ▲ Minimize management burden on the ULBs
- ▲ Standards, accreditation and quality assurance done upstream at the national level
- ▲ Review
 - ▲ Provide mechanism for QA/ audits
- ▲ Conflict of Interest
 - ▲ Remove conflict of interest between TPA and project team
 - ▲ Remove conflict of interest between TPA and QA body

Separation of Roles

Third Party
Assessors

Execute the technical compliance checking

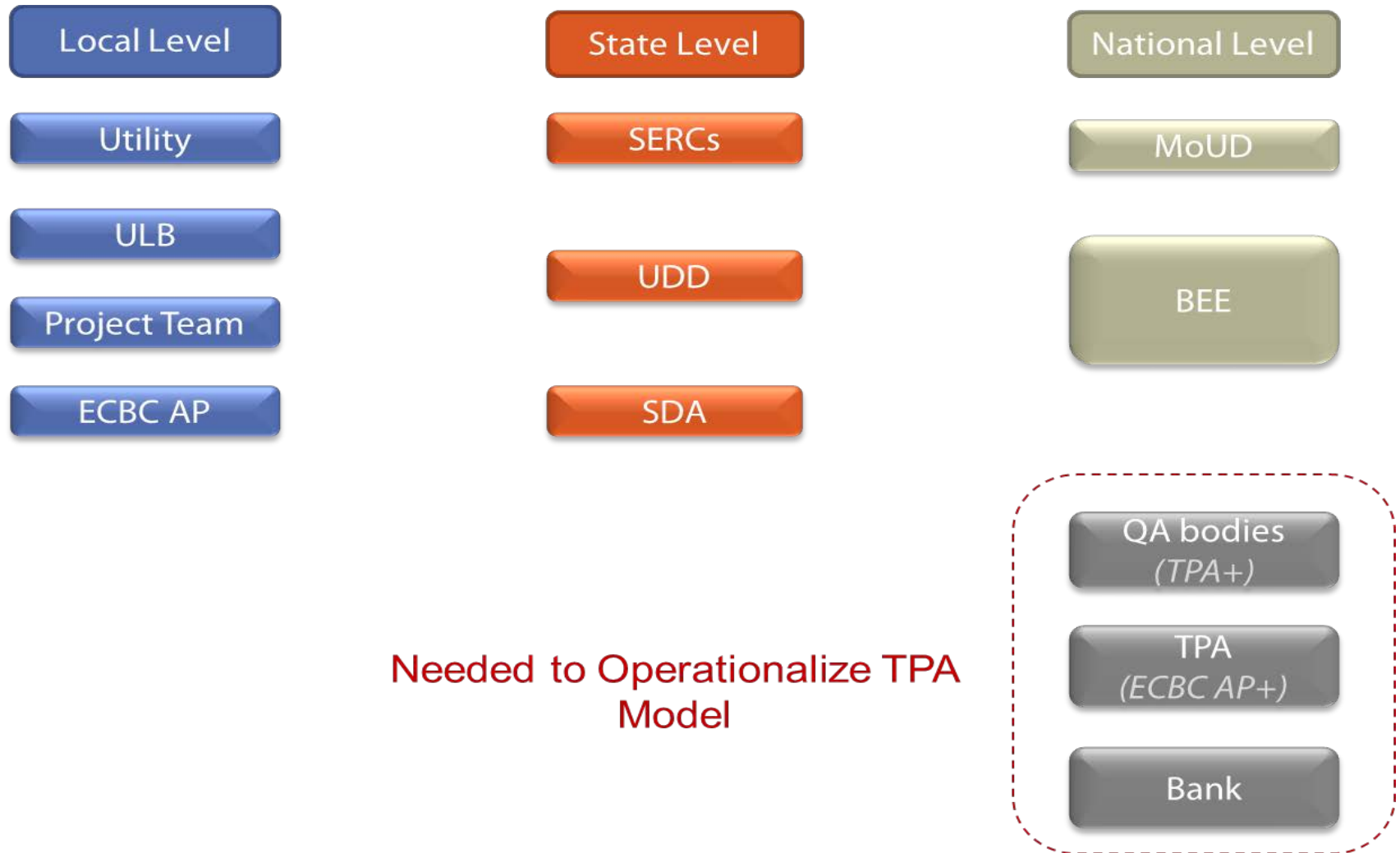
Non Profit
Institutions

Measure consistency and effectiveness
of checking

Government
Agencies

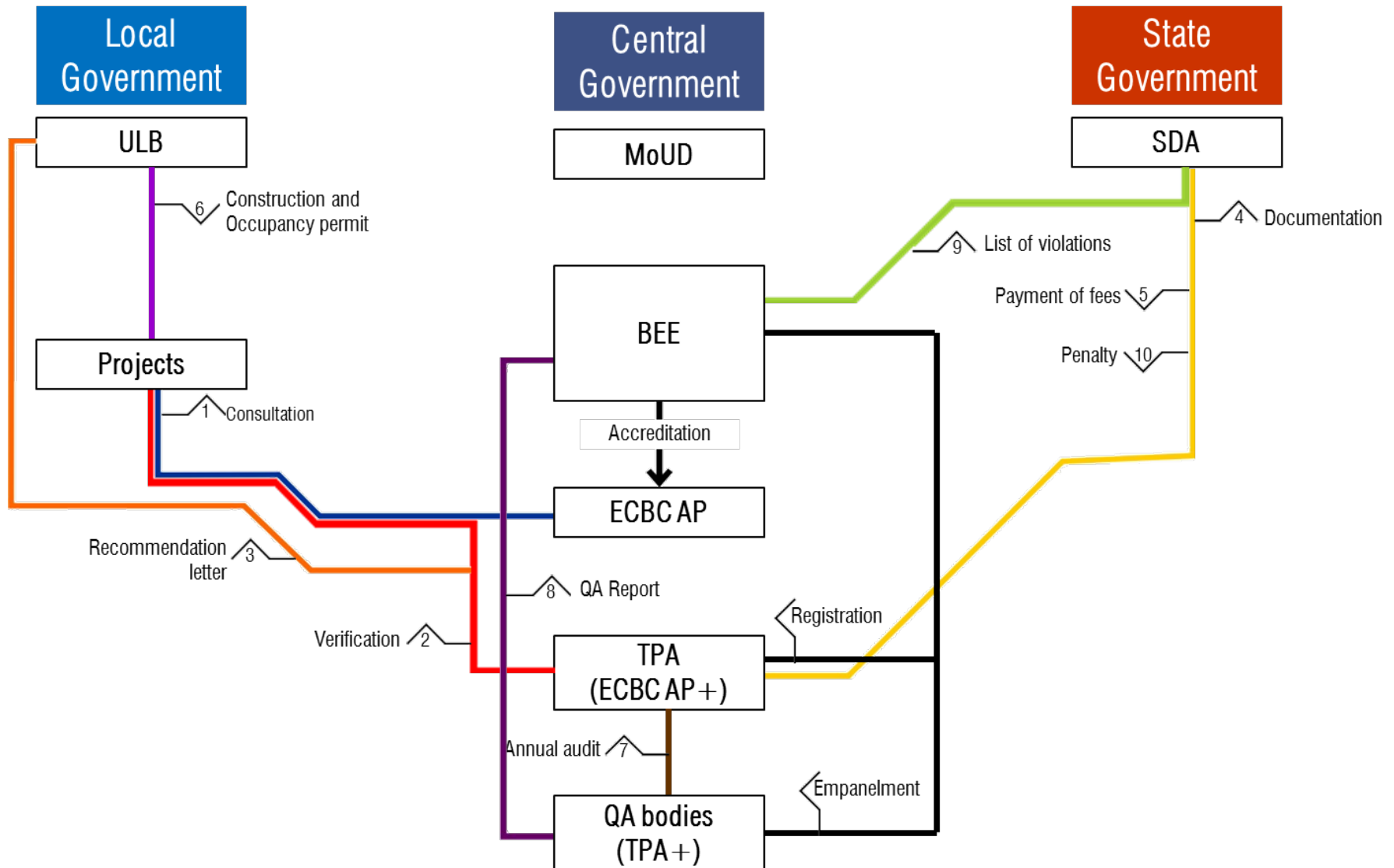
Provide regulatory framework and set
standards of quality

Entities involved in TPA Model

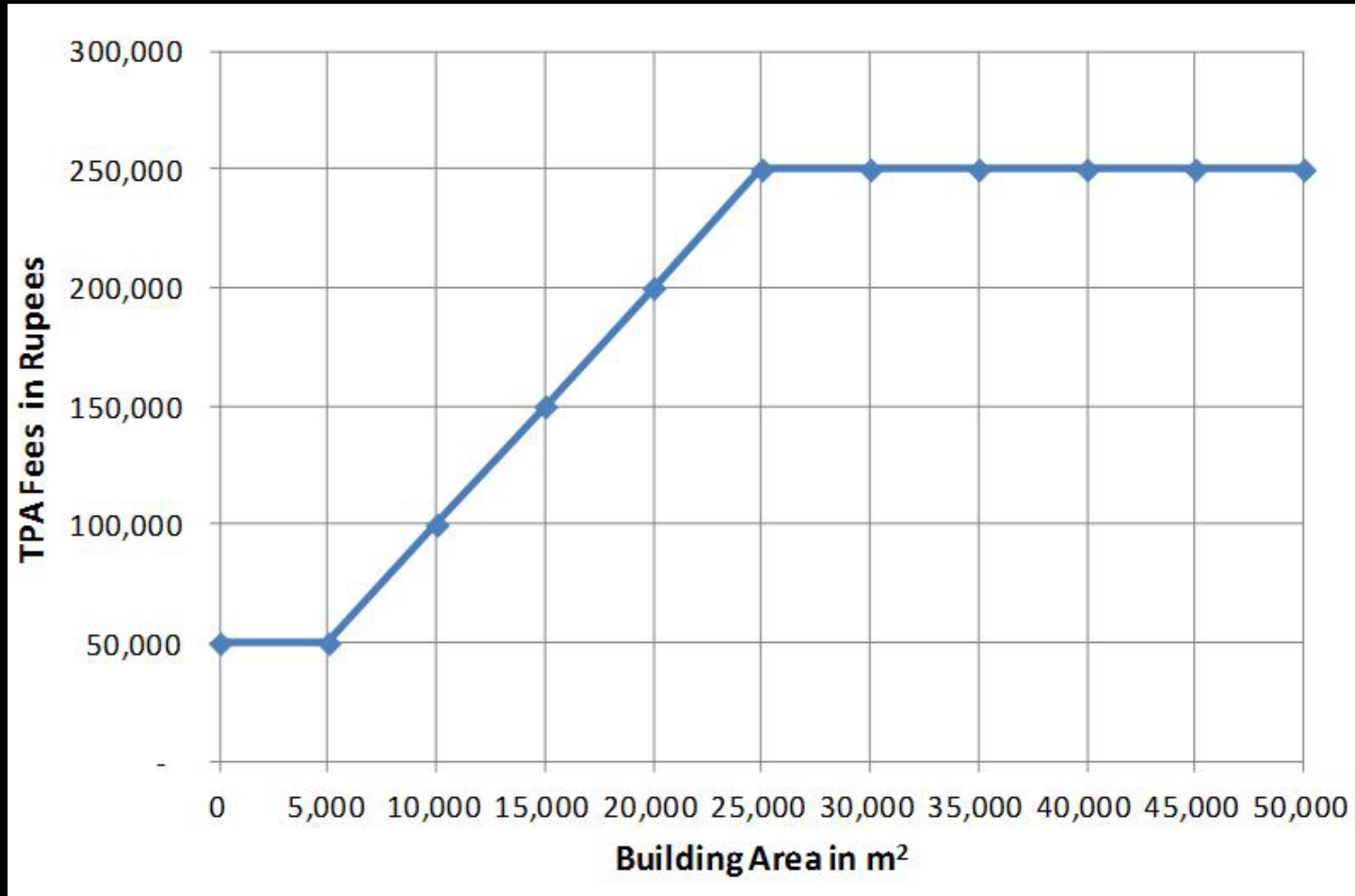


Needed to Operationalize TPA Model

Proposed TPA Model



TPA Fees



This cost is less than INR 0.002/kWh of energy saved with ECBC.

QA Coordination

- ▲ QA Bodies meet for allocation of projects.
- ▲ QA Bodies meet annually with BEE to share findings and make recommendations.
- ▲ National QA Committee will review and resolve appeals for violations.
- ▲ National QA Committee is responsible for making sure that the quality of checking is maintained and improved over a period of time.

Funding Mechanism

- ▲ Each State Designated Agency (SDA) sets up Letter of Credit (LOC) approach and terms with the selected bank.
- ▲ Each project team opens LOC for entire fee in the name of the selected TPA for their project.
- ▲ When the TPA completes a deliverable, the official at the SDA authorizes the bank to release the associated payment to the TPA.
- ▲ BEE will pay the QA Bodies for the annual QA activities.

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 - ▲ Research and development of the proposed framework

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Rajan Rawal, CEPT University rajanrawal@gmail.com

Prasad Vaidya, berkeleyprasad@gmail.com

Vinay Ghatti, The Weidt Group vinayg@twgi.com

Sanyogita Manu, CEPT University sanyogitamanu@cept.ac.in

*Smita Chandiwala, Shakti Sustainable Energy Foundation
smita@shaktifoundation.in*