

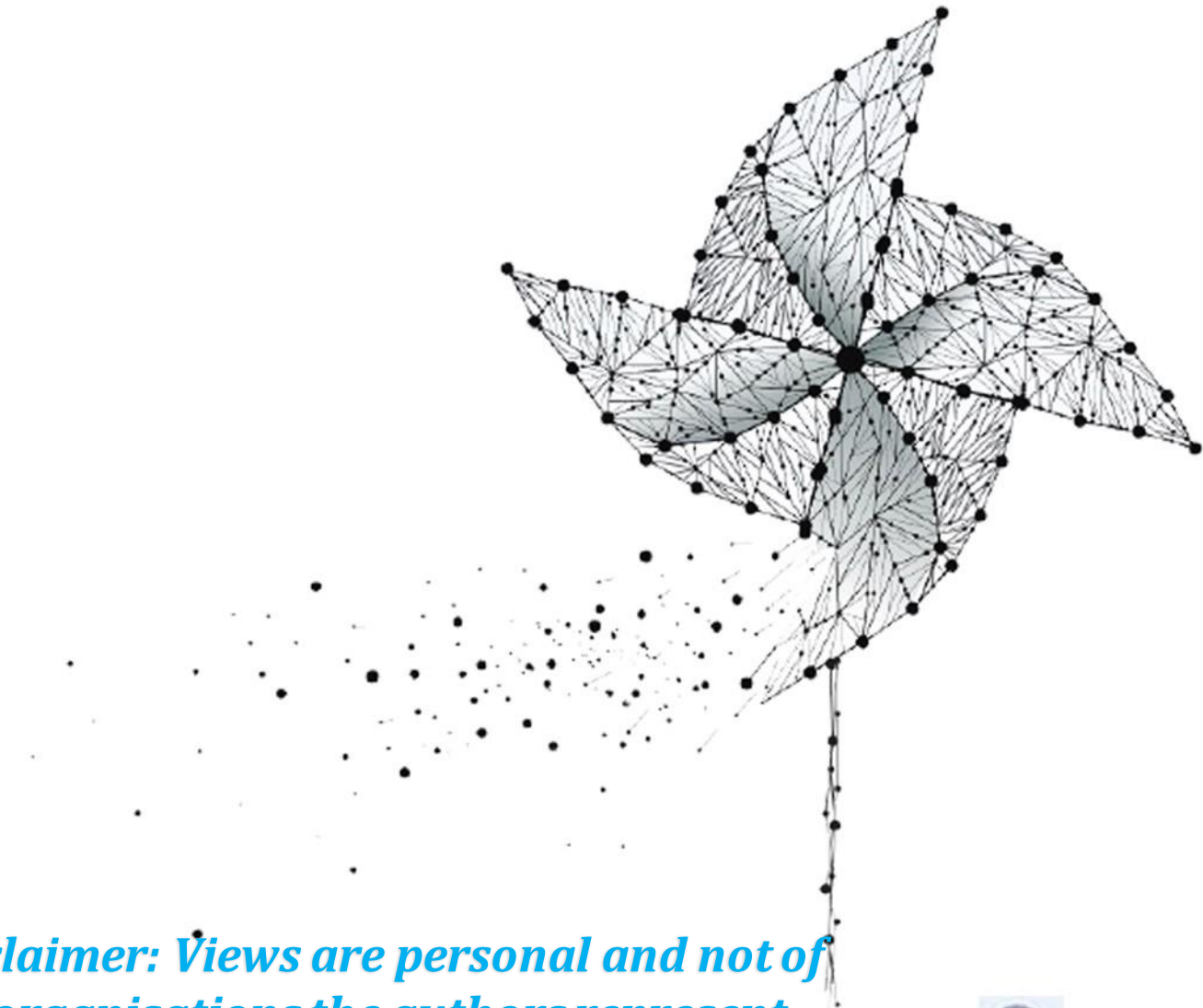
# RENEWABLE ENERGY IN INDIA

Economics and  
Market Dynamics

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## Context

- ❖ **Scope of RE technologies has leap-frogged**
  - from lab stage to large scale commercial generation
- ❖ **But RE still relying**
  - on policy support heavily
- ❖ **Current debate**
  - how RE should be priced and integrated into the market!

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## Context

- ❖ **This Work**
  - **conceived from economics perspective**
  - **critically examines aspects of**
    - **pricing; regulatory oversight; and market for intermittent RE**
  
- ❖ **Introspects on policy dilemma facing RE segment in India**
  - **explores possibility of level-playing field for RE *vis-a-vis* non-RE**
    - **through appropriate market mechanism**

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## Chapter Outline

- ✓ **Renewable in India: In the Context of Evolution of Power Sector**
- ✓ **Structural Reforms in Power Sector: Implication for Renewable**
- ✓ **Policies Supporting Renewable: Aid to Market Formation**
- ✓ **Distributed Energy Resources: Business Models and Market Dynamics**
- ✓ **Renewable Energy Pricing in India: What is Missing?**
- ✓ **Renewable Purchase Obligation: Does it Need a Revisit as Instrument for Market Creating?**
- ✓ **Renewable Energy Certificate (REC): Has it Outlived Its Life as Market-based Mechanism?**
- ✓ **Intermittent Renewable: How to Enable Participation in Market?**
- ✓ **Market Design for Renewable Energy: Right Design, A Missing Link in India**
- ✓ **Renewable Policy Introspection: Rethink and Move in the Right Direction**

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## Focus Areas

- **RE Pricing**
  - Auction design for renewable !
- **Renewable Purchase Obligation (RPO) Regime**
  - Rethink!
- **RE Market Design**
  - Way Forward

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## Auction Design/RE Pricing

- **Auctioning approach must be continued, however...**
- **Future auction design could include only the first stage**
  - with the 'first price electronically sealed bidding' retained for its design

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## RPO

- **RPO regime !**
  - Freeze the current level of RPO percentage
  - Address discom concern.....by moving
- **RE gradually to market**
  - Cfd contract need be tried

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## RE Market Design

- ❖ **Enlarge Market geographies**
  - **MBED!**
- ❖ **Make Market faster**
  - **15-minute to 5-minute market**
- ❖ **Let RE and load manage variation through market**
  - **Don't lean on grid through unscheduled interchange**
  - **Participate in DAM/correct position in RTM**

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## RE Market Design

- ❖ **Pool wind and solar at least at pooling station**
  - **reduce forecasting error/balancing cost**
- ❖ **Next level of transmission pricing**
  - **Generators including RE generators to compete on efficiency of operation and price,**
    - **without bothering about transmission price**
  - **Transmission charge explicitly to buyers.**
- ❖ **Ensure adequate reserves**
  - **through market based procurement of ancillary services**
  - **with proper incentives for higher ramps**

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## Way Forward

- ❖ **Make variable renewable gradually**
  - **compete with conventional generation**
- ❖ **Increase in penetration of renewable**
  - **is likely to render some conventional power plants stranded**
- ❖ **Options to mitigate risks for legacy contracts be explored and more importantly**
  - **resource adequacy requirement and**
  - **future power procurement strategy****be redesigned with these realities in mind**

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## Thank You

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