



Transactive Energy Challenge Kickoff

Workshop: Tata Consultancy Services Ltd. (TCS)

Area of Interest:	Integrated What-if Analyzer for Wholesale Electricity Market
Functionality / Capabilities:	Optimal portfolio, optimal bidding strategy, spot price under different market scenarios
Proposed Scenario:	Model & simulate the short term market environment to conduct “What-If” studies
Impacts/Why:	Game theoretic modeling of generators in an integrated market environment & stochastic modeling of the uncertainties in Distributed Energy Resources (DER) & in demand
Partners Needed:	Generation companies, Market Operators



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Area of Interest:	Microgrid Based Operations, Flexible Microgrids
Functionality / Capabilities:	Network, DER & Storage Modeling, Simulation of Dynamic Microgrids
Proposed Scenario:	Optimal network configuration using Honeycombed Microgrids covering the service area; Microgrids based operations
Impacts/Why:	Flexible Honeycombed Microgrid model covering the service area & set of scenarios & use cases based on the TE Framework
Partners Needed:	Distribution Companies & Retailers



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Area of Interest:	Impact of Price on Demand & on Distributed Energy Resources
Functionality / Capabilities:	Price-Demand & Price-DER relationship models, game-theoretic model for conflict of objectives
Proposed Scenario:	Model impact of price on demand / DER & to model conflicts using game theory
Impacts/Why:	Price-Demand & Price-DER relationships will help in value-based control & DR programs
Partners Needed:	Distribution companies / Retailers, DER Owners



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Area of Interest:	Analytics for Enabling Demand Response
Functionality / Capabilities:	Solar corrected demand forecast; Optimal location of charging stations; Inputs to DR programs; Information on Outages
Proposed Scenario:	Develop analytics for enabling Demand Response using smart meter data
Impacts/Why:	Analytics using data intelligently to support the utility in transactive control
Partners Needed:	Distribution companies / Retailers



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Area of Interest:	Distribution System Operator Model
Functionality / Capabilities:	Model for encouraging active participation of Prosumers; Algorithms for automatic load scheduler at Prosumer level; Incentives / Penalties to Prosumers to provide PQ (Power Quality) as a service based on voltage / frequency change required, duration of service, & Response time
Proposed Scenario:	Design a DSO model which includes direct participation of Prosumers in the retail market & incentives for prosumers to provide PQ as a service
Impacts/Why:	Optimal response of a Prosumer using load scheduling algorithms & PQ as a service
Partners Needed:	Distribution companies

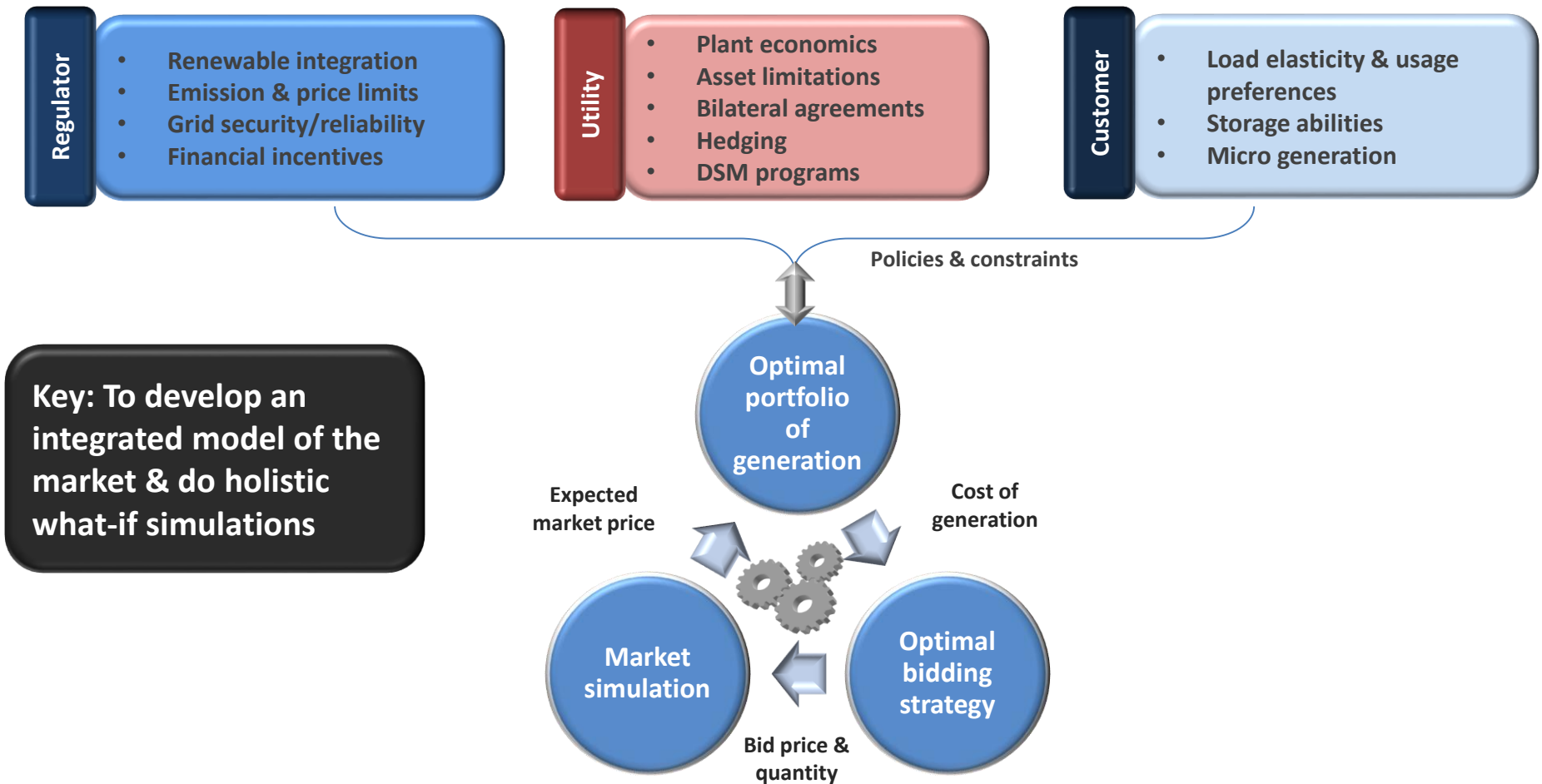


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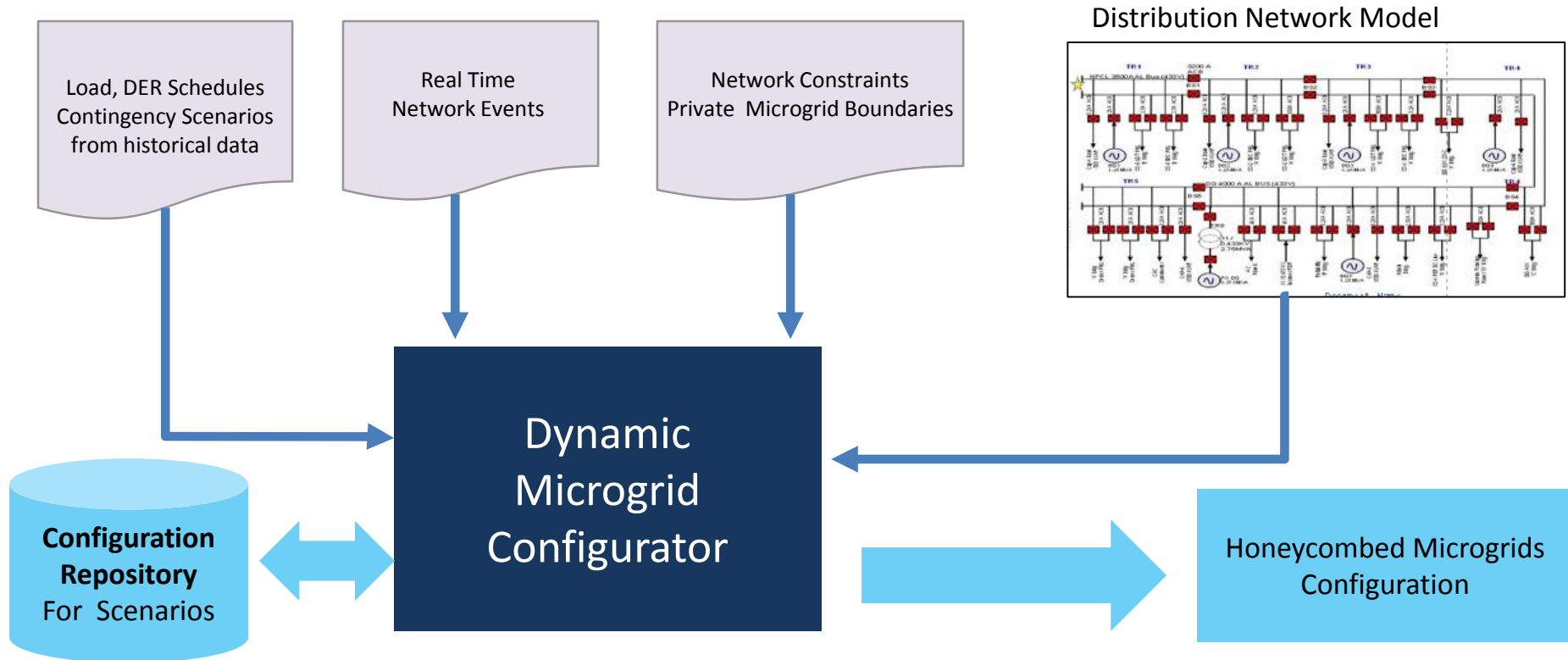
Area of Interest:	Mechanism Design for Promoting Green Energy
Functionality / Capabilities:	Incentive mechanism design, game theoretic modeling
Proposed Scenario:	Mathematical model for green energy promotion using incentive based mechanism
Impacts/Why:	Promoting green energy for TE evaluation
Partners Needed:	Regulators, policy makers, academic institutions

Integrated What-if Analyzer for Wholesale Electricity Market

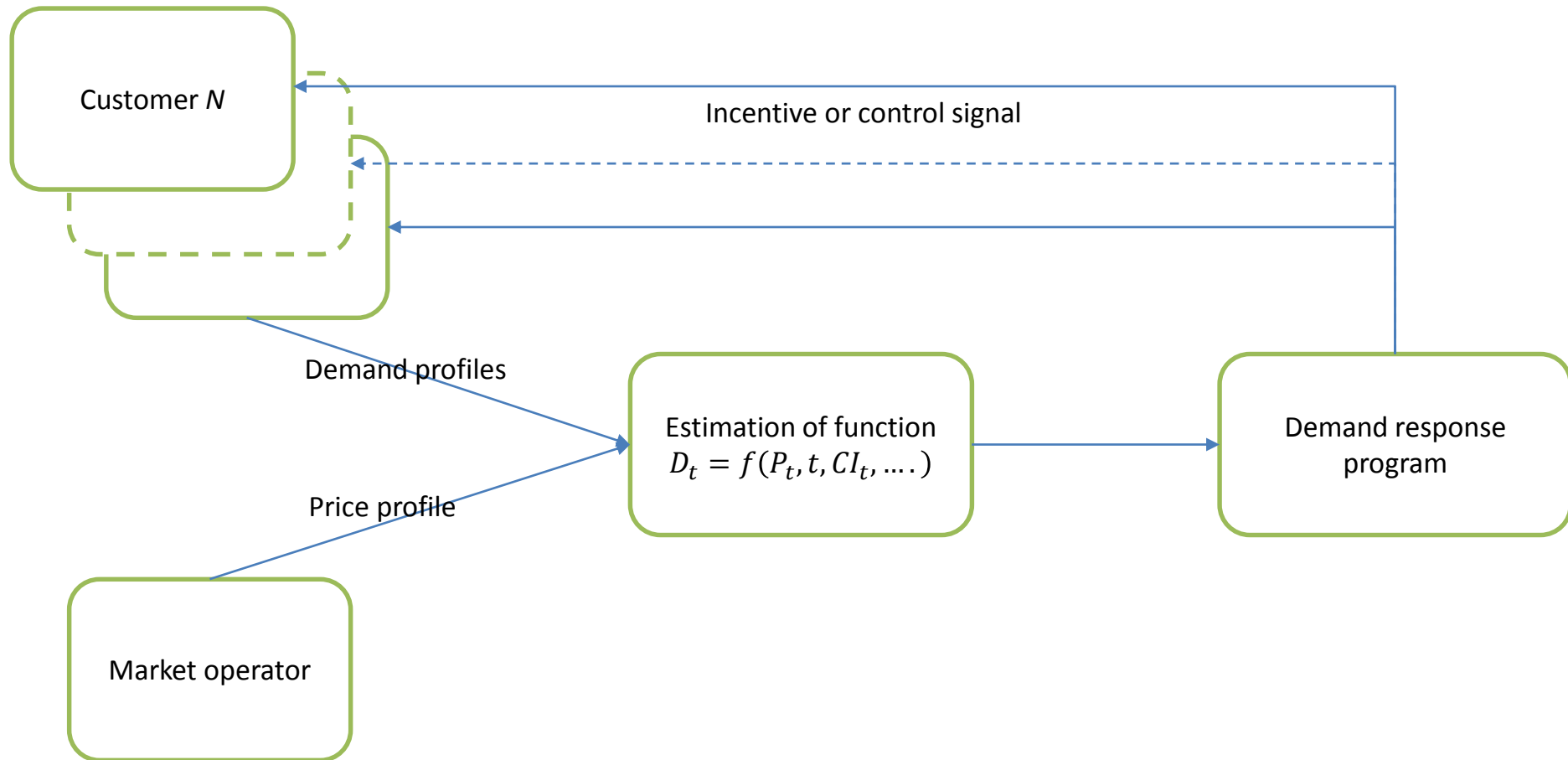


Microgrids Based Operation

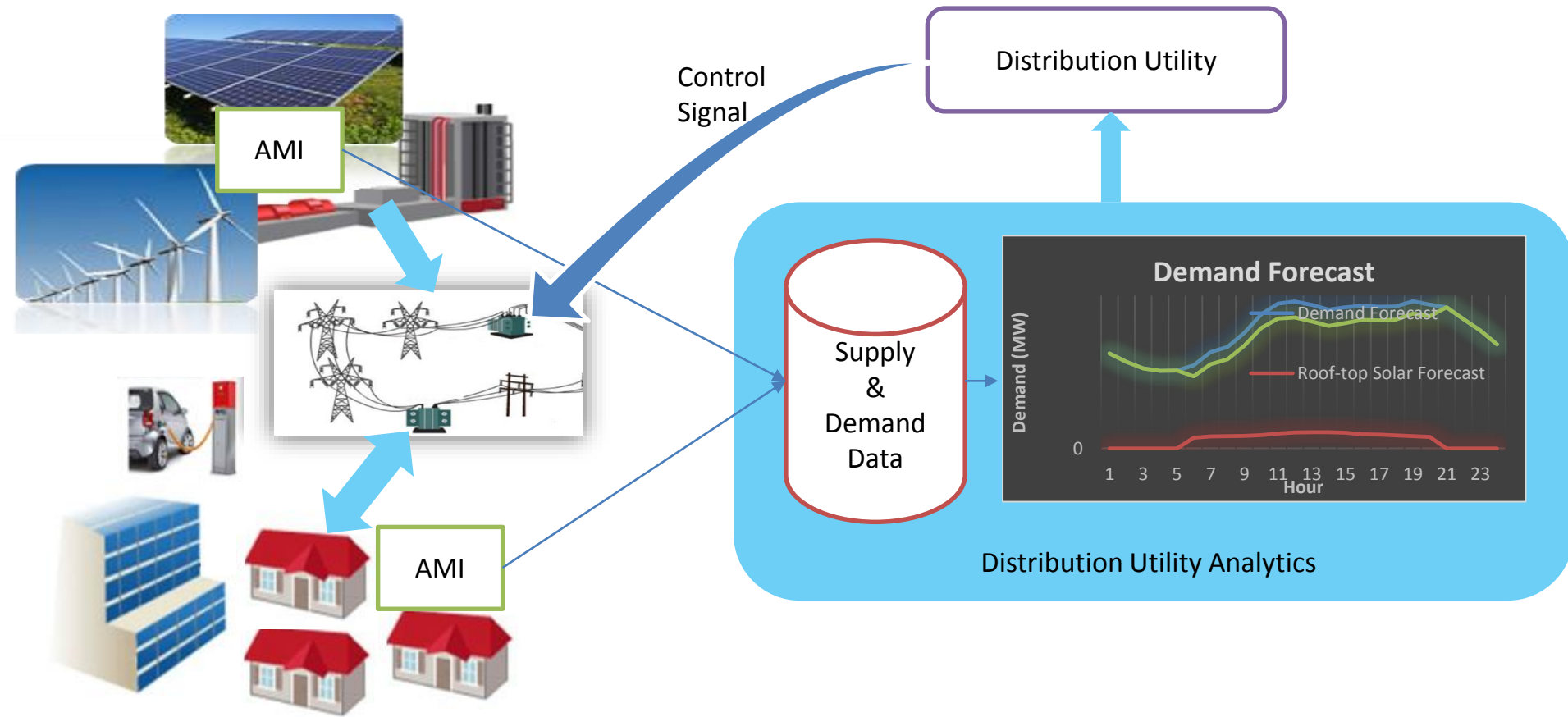
Flexible Honeycombed Microgrids



Impact of Price on Demand & Distributed Energy Resources

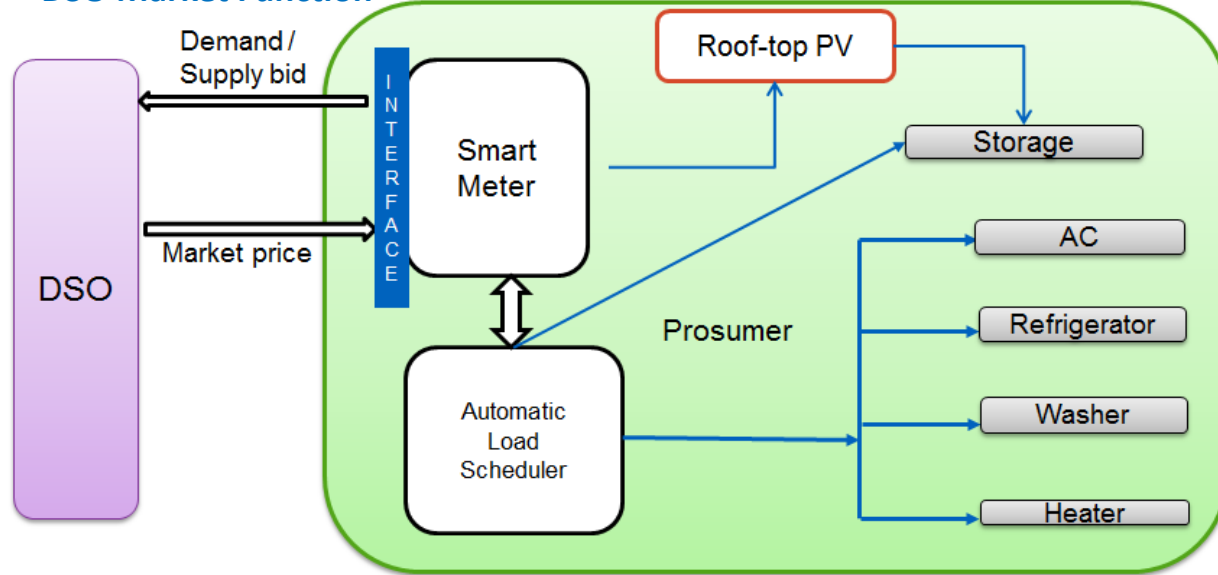


Analytics for Enabling Demand Response

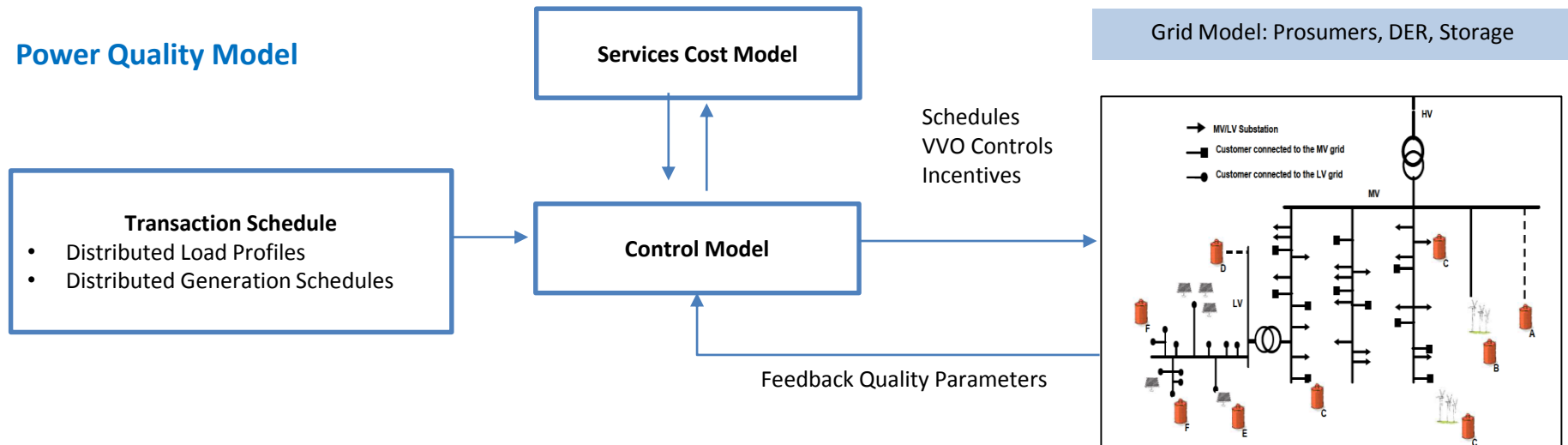


Distribution System Operator Model

DSO Market Function



Power Quality Model



Mechanism Design for Promoting Green Energy

