

1. **Can the unaided market ensure Public Benefits?**

1.1. *The power of the market (the good news)*

The market is an excellent allocator of manpower, capital, technology and resources.

1.2. *To promote public benefits and sustainable development, the market must ensure several objectives*

- competition
 - between old generators and new independent power producers (IPPs) to supply wholesale power to distributors (a pre-requisite for this is that all generators (including IPPs) must have open access to grid
 - between generators and distributors to supply power to large consumers
 - between the expansion of supply to consumers from distributors and the improvement of the efficiency with which they use the supply
 - between energy service companies (ESCOs) and distributors to provide these efficiency improvements
- widening of access to electricity and protection of interests of economically weaker consumers
 - Increasing the spread of electricity to cover the whole population
 - Protection of poor segment outside market
 - Protection of captive market segment
- environmentally sound energy technologies
 - transition to "cleaner" technologies of generation from fossil-fuels
 - transition to renewable non-fossil-fuel sources and efficiency improvement
 - Non-fossil fuel obligation (NFFO)
 - Fossil-fuel Levy
 - Improving the efficiency of production and use of energy
 - decentralized sources for rural areas
- current energy decisions being part of long-term strategy

1.3. *The limits of the market (the bad news)*

- Economic inefficiency
 - Limits to competition in electricity sector because vertical integration of generation-transmission-distribution is a necessity of the system which promotes therefore a natural monopoly
 - Faulty capital allocations and stranded investments (for example, nuclear power) tend to restrict competition in electricity sector

- End-use efficiency opposed by market (because profit maximization requires sales maximization which means unaided market will not promote conservation)
- Private sector uses higher discount rates than public sector; hence, bias against capital-intensive projects
- Higher discount rates means higher prices, and therefore political hurdle
- Establishing and maintaining competition requires large state intervention (competition requires regulator)
- Equity
 - market ignores those outside the market
 - market is biased in favour of those with strong market power
 - market biased towards rich regions
 - market biased towards urban areas
- Environmental soundness
 - market considers environmental impacts as externalities
 - market discount rate biased against the long term
- Empowerment
 - market not concerned about strengthening self-reliance and empowering communities
- Long-term
 - market biased against long-term investments on R & D and infrastructure,
- Market alone cannot ensure that electricity systems will advance public benefits and sustainable development

2. The invisible hand (market) needs help from the visible hand (regulation)

- to increase coverage of electricity
- to protect captive segment of market (single commodity-two segment market with competitive and monopolistic segments)
- to protect those outside market
- to lay down rules (absolute competition = no rules)
- to establish level playing field
- no competition without regulation
- removal of government from market and ownership change by themselves won't produce competition
- private monopolies need heavier regulation
- to specify type and length of contracts (long contracts are good for planning, and short contracts are good for competition) between generators, distributors and large consumers

3. **Scope of Regulation**

3.1. *Restructuring of existing Institutions and Introduction of New Institutions*

- Breaking up monopoly generator into n>1 generators
- Permitting IPPs and DECENTS (grid-connected and stand-alone)
- Guaranteeing grid access to IPPs or separation of grid transmission from generation and ensuring open transmission access to any generator
- Creation of ESCOS to compete with utilities to supply efficiency improvements to consumers

3.2. *Promotion of Competition through creation/ maintenance of LPFs*

- LPF between FIPPS and RIPPS
- LPF between IPPS and n>1 Generators
- LPF between Centralized and Grid-connected DECENTS
- LPF between Grid-based Distributors and Stand-alone DECENTS
- LPF between Efficiency Improvements and Distributors

3.3. *Widening Access and Promoting Equity*

- Making it an obligation for generators and grid transmitters to supply distributors adequately to meet needs of small consumers
- Guaranteeing access to small consumers
- Preventing politically influential "free riders" (for example, irrigation pumpset owners)
- Making it an obligation for rural areas to be electrified through the grid-based distribution and/or Stand-alone DECENTS

3.4. *Integrated Resource Planning*

- IRP is necessary to identify a socially-beneficial mix of Centralized, Grid-connected DECENTS, Stand-alone DECENTS and Efficiency Improvements
- Such a mix will suggest what LPFs must be established and what are the rules of the game that must be prescribed

3.5. *Research and Development and Demonstration*

- IRP will identify the technologies of centralized, grid-connected decentralized and stand-alone decentralized generation and of end-use efficiency improvements that can benefit from research and development and demonstration
- These technologies must be assisted to go through the learning process

3.6. *Environmental Protection*

- Internalizing the externalities
- Correcting for the bias of the market discount rate against the long term

3.7. *Pricing*

- Making electricity prices move towards true long-term marginal costs of generation + transmission + distribution
- Ensuring in the transition that consumer expenditures do not increase by making efficiency improvements and reduced consumption offset increasing prices
- Monitoring prices to ensure that they are not increased to skim profits

3.8. *Protecting State-inspired Stranded Investments*

- Several massive state-sponsored investments in the electricity sector (e.g., nuclear power stations) have been stranded by newer technologies (e.g., gas turbines, cogeneration, etc.)
- Since they cannot withstand market forces, they have to provided a "safety net" and a transition to survival.

3.9. *Actors involved in Regulation*

- Established Generators
- Old and new IPPs
- DECENTs (Grid-connected and Stand-alone)
- Transmission grid
- Distributors
- ESCOS
- Consumers (Large and Small) of various categories (including politically influential "free riders" such as irrigation pumpset owners)
- Environmental organizations (Governmental and non-governmental)
- Planners involved in *Integrated Resource Planning*
- Research and Development organizations
- Regulator