



Bureau of
Energy Resources,
United States
Department of State



National
Association of
Regulatory
Utility
Commissioners

Integrated Resource Planning The Basics and Beyond

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Regional Workshop on Energy Regulation & Regional Coordination: Lower Mekong Initiative
Bangkok, Thailand October 14-16, 2013





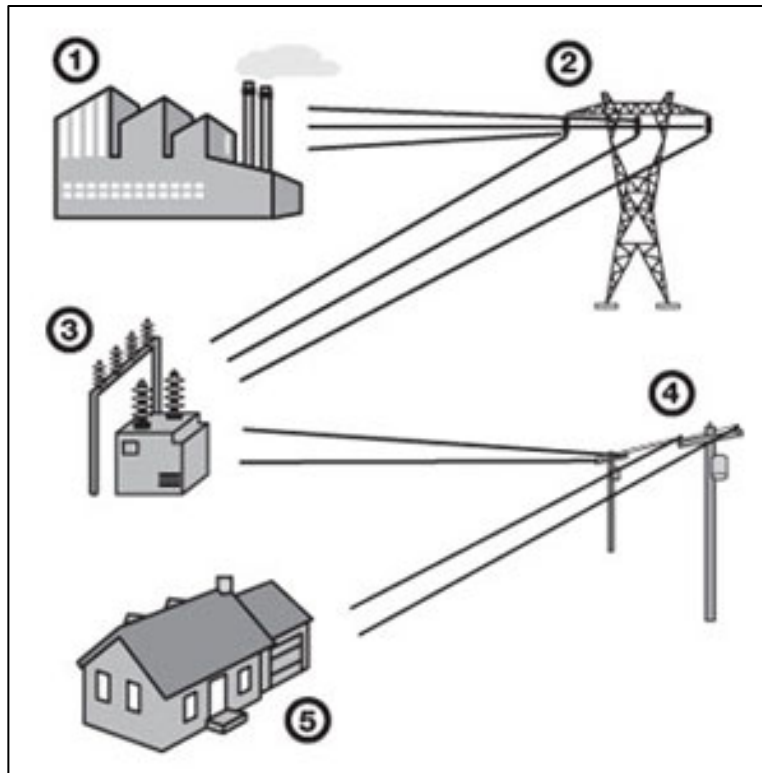
I. BRIEF HISTORY OF IRP

A. For most of 20th Century no need for organized planning structure with regulators

- 1. Increasing demand for electricity**
- 2. Increasing economies of scale**
- 3. Average costs went down**

I. BRIEF HISTORY OF IRP

B. Utilities were vertically integrated



Single utility
in a geographic
area provided
generation,
transmission
and
distribution
resources.



I. BRIEF HISTORY OF IRP

C. Nuclear plants were planned, cost overruns resulted and plants were cancelled

D. Rate of demand increase dropped



I. BRIEF HISTORY OF IRP

- E. Energy crisis in 70's –
Prohibited use of gas for electricity generation





I. BRIEF HISTORY OF IRP

F. IRP was state response to minimize total societal cost of electricity in production.

“Rules for regular reporting and commission review of load forecasts and resource plans of the state’s electric utilities to meet future demand with an adequate and reliable supply of electricity at the lowest possible cost for all customers within their service areas and satisfy all related state and federal laws and regulations.” 807 KAR 5:058

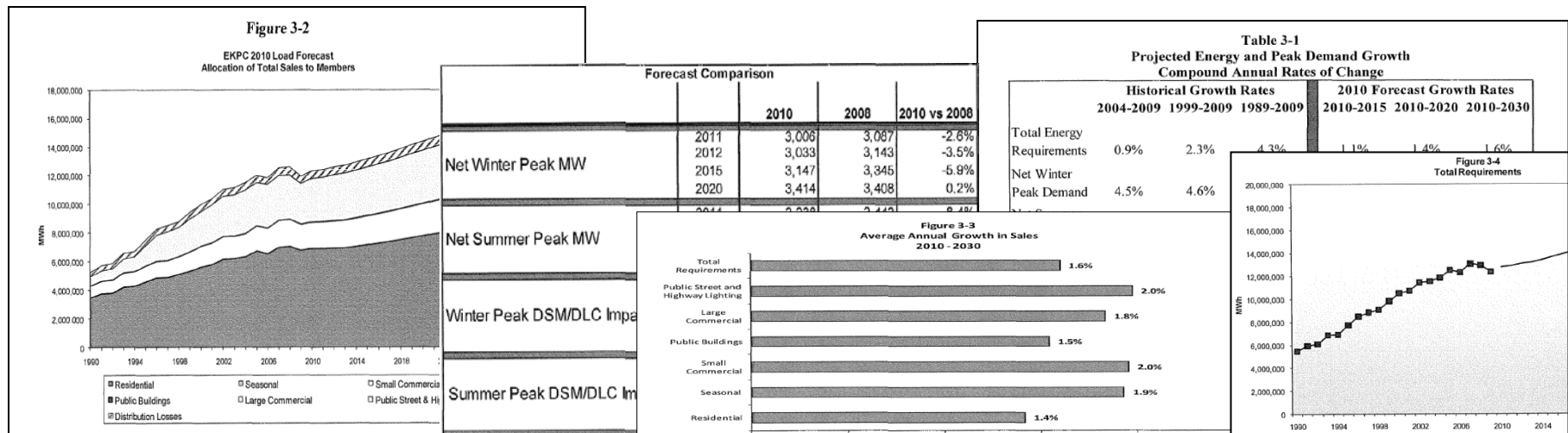


II. INTEGRATED RESOURCE PLAN

A. Fifteen year planning horizon

B. Every three (3) years

C. Load forecast – detailed modeling





II. INTEGRATED RESOURCE PLAN

D. Resource assessment and acquisition plan

- Demand side programs
Ex. Load control





II. INTEGRATED RESOURCE PLAN

D. Resource assessment and acquisition plan

- **“including utility or government sponsored conservation and load management programs.”**
- **“assessment of nonutility generation, including generating capacity provided by cogeneration, technologies relying on renewable resources and other nonutility services.”**



II. INTEGRATED RESOURCE PLAN

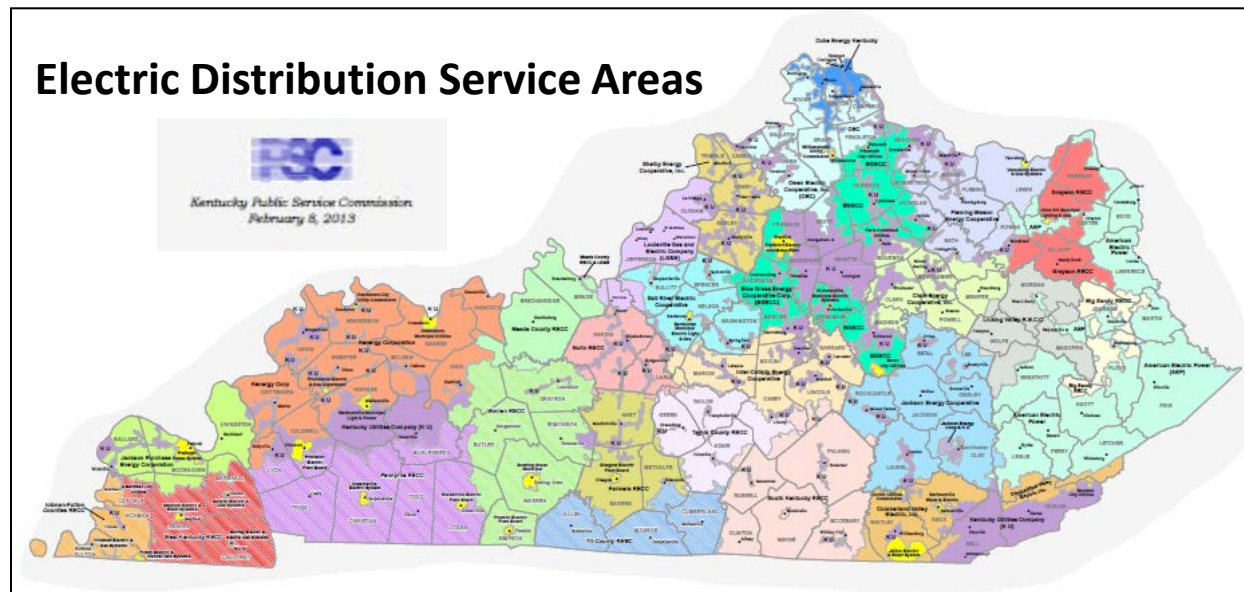
E. Financial information

- **Revenue Requirements**
- **Discount rate**
- **Average system rates**

II. INTEGRATED RESOURCE PLAN

F. Planned Transmission Facilities

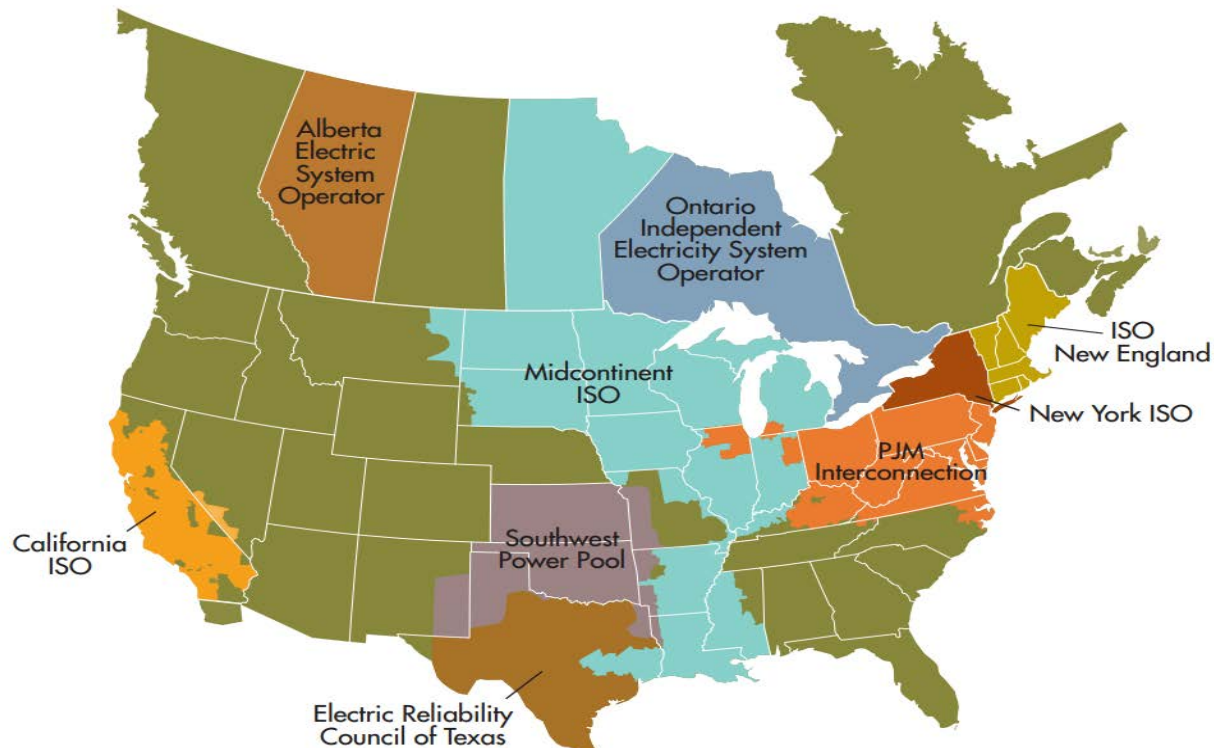
“Known, significant conditions which restrict transfer capabilities of other utilities.”





III. New Priorities

A. Open access transmission – Regional Transmission Organizations (RTO's)





III. New Priorities

B. Restructuring, deregulating – generation is unbundled – independent system operator for reliability – functional control of transmission is transferred to ISO/RTO

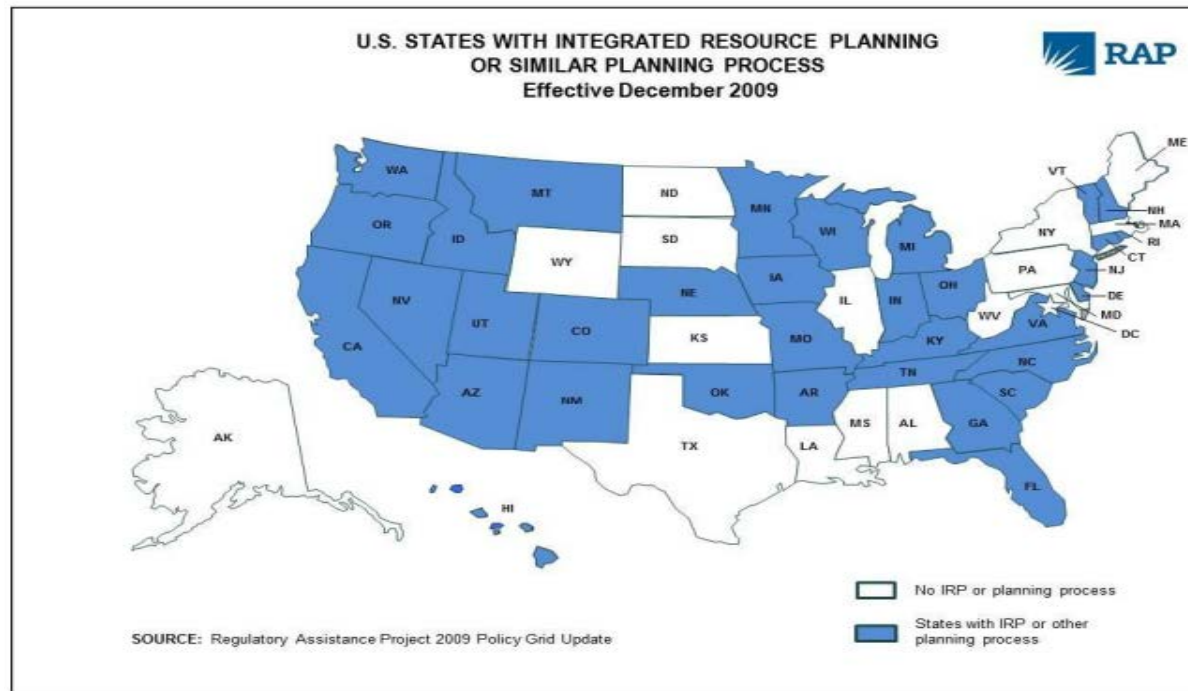
Competition is better – Generation is supplied by contracts and/or markets



III. New Priorities

C. Environmental requirements increase

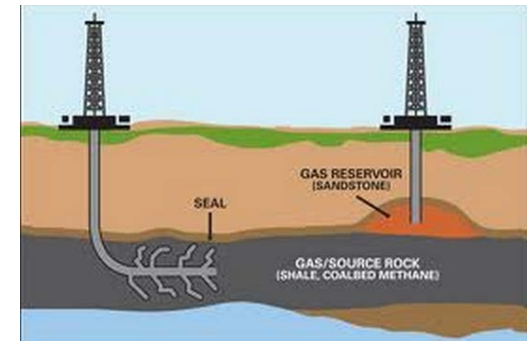
D. Many states eliminate IRP's (about 50%)





IV. Regional Planning Increases

- A. Transmission planning at RTO level
- B. Renewables (tax policy) to load centers
- C. Reliability
- D. FERC Order 1000¹
- E. Expensive new generation
- F. Rise of fracking and use of natural gas generation.





V. New Emphasis in State IRP

- A. Concern re: cyber security—confidential**
- B. Environmental**
- C. Transmission**



VI. Sample IRP

- A. Hundreds of pages; three volumes; extremely detailed studies**

- B. File plan, Questions asked, Commission Report filed (56 pages)**

Parties intervene, e.g. Attorney General (consumers), Sierra Club (environmental interests), industrial consumers.



VI. Sample IRP

C. “In the next IRP, EKPC should:

1. Discuss and provide analysis with regard to EKPC’s 12 percent planning reserve margin and its effects on its capacity expansion plans as they relate to the slightly less than three percent reserve margin required by PJM.



VI. Sample IRP

C. “In the next IRP, EKPC should:

2. Continue to pursue cost effective opportunities and provide information concerning cogeneration, renewables, and exploration of stranded gas opportunities.



VI. Sample IRP

C. “In the next IRP, EKPC should:

3. Discuss the effect joining PJM has had on the KU/LG&E transmission line contract and the included interconnections.



VI. Sample IRP

C. “In the next IRP, EKPC should:

4. Discuss the pending/ongoing plant modifications required to meet EPA or other environmental legislation. Further, EKPC included no CO₂ costs in the supply side evaluation and did not specifically address CO₂ issues in their compliance planning...



VI. Sample IRP

C. “In the next IRP, EKPC should:

4. (continued.) Staff views the exclusion of CO₂ from the IRP as a shortcoming and therefore...the Commission expects that the environmental compliance planning be performed comprehensively, considering not only existing and pending regulations, but also those reasonably anticipated, including, but not limited to CO₂.



VI. Sample IRP

C. “In the next IRP, EKPC should:

5. Summarize the annual PJM transition reports filed as a result of Case No. 2012-00169 and inform the commission of its effects on EKPC’s reliable production of power.



VI. Sample IRP

C. “In the next IRP, EKPC should:

6. Report on the ongoing SEPA construction and its effects on EKPC’s hydropower.



VI. Sample IRP

C. “In the next IRP, EKPC should:

7. EKPC should fine tune its DSM modeling projections in its next IRP in order to close the gap between its theoretical and actual peak demand and energy savings;



VI. Sample IRP

C. “In the next IRP, EKPC should:

8. EKPC should include all environmental costs, as they become known, in future benefit/cost analyses;



VI. Sample IRP

C. “In the next IRP, EKPC should:

9. EKPC should continue studying the PJM capacity markets for economic opportunities related to its DSM and energy efficiency programs and participate at the earliest, most practical time;



VI. Sample IRP

C. “In the next IRP, EKPC should:

10. EKPC should work with its member cooperatives to further educate and encourage them and their customers about the importance of DSM, energy efficiency, and conservation;



VI. Sample IRP

C. “In the next IRP, EKPC should:

11. EKPC should fully involve all members of the Collaborative to identify new cost-effective DSM programs, best practices, and opportunities for enhancement of its existing programs;



VI. Sample IRP

C. “In the next IRP, EKPC should:

12. EKPC should continue to work with stakeholders in developing energy efficiency reporting guidelines standards, and templates.



Footnotes and Resources

¹FERC Order 1000. <http://www.ferc.gov/industries/electric/indus-act/trans-plan.asp>

Resource Links:

EKPC IRP referred to may be found on the Kentucky Public Service Commission website www.ky.psc.gov in “Commission Records” under “non-electronic cases” in the year 2012, case number 2012-00149, or at the following link: [http://psc.ky.gov/Home/Library?type=Cases&folder=2012 cases/2012-00149](http://psc.ky.gov/Home/Library?type=Cases&folder=2012%20cases/2012-00149)

KAR <http://www.lrc.ky.gov/kar/frntpage.htm>

KY PSC <http://psc.ky.gov/>

PJM <http://www.pjm.com>



Glossary and Acronyms

DSM Demand-side management (DSM) programs consist of the planning, implementing, and monitoring activities of electric utilities which are designed to encourage consumers to modify their level and pattern of electricity usage. *Source:* <http://www.eia.gov/>

EKPC East Kentucky Power Cooperative (EKPC) provides electric power to its 16 owner-members serving more than 1 million Kentuckians. EKPC owns and operates four power plants totaling nearly 3,000 megawatts in capacity, as well as more than 2,800 miles of high-voltage transmission lines. EKPC and each of its 16 owner-member cooperatives is owned and democratically governed by the people who use their energy and services. *Source:* <http://www.ekpc.coop/>

FERC The Federal Energy Regulatory Commission (FERC) has jurisdiction over interstate electricity sales, wholesale electric rates, hydroelectric licensing, natural gas pricing, oil pipeline rates, and gas pipeline certification. FERC is an independent regulatory agency within the Department of Energy. *Source:* <http://www.ferc.gov/>

IRP An Integrated Resource Plan (IRP) is a comprehensive and systematic blueprint developed by a supplier, distributor, or end-user of energy who has evaluated demand-side and supply-side resource options and economic parameters and determined which options will best help them meet their energy goals at the lowest reasonable energy, environmental, and societal cost. *Source:* www.energycentral.com/reference/glossary

ISO An Independent System Operator (ISO) is an independent, Federally regulated entity established to coordinate regional transmission in a non-discriminatory manner and ensure the safety and reliability of the electric system. *Source:* <http://www.ferc.gov/>

KAR Kentucky Administrative Regulations (KAR) are rules promulgated by the state legislature of the Commonwealth of Kentucky. *Source:* <http://www.lrc.ky.gov/law.htm>

KU/LGE Kentucky Utilities Company (KU) is an electric utility, based in Lexington, Ky., serving 77 Kentucky counties and five counties in Virginia. Louisville Gas and Electric Company (LGE) is an electric and natural gas utility based in Louisville, serving customers in Louisville and 16 surrounding counties. KU/LGE have a joint generation capacity of 8,300 MW and serve 943,000 electricity customers and 321,000 natural gas customers over a transmission and distribution network covering some 27,000 square miles. These two utility businesses are regulated in Kentucky by the Kentucky Public Service Commission. *Source:* <http://www.lge-ku.com/>

KY PSC The Kentucky Public Service Commission (KY PSC) is a three member administrative body with quasi-legislative and quasi-judicial duties and powers regulating over 1,500 utilities. It is funded by an assessment paid by all utilities under the Commission's jurisdiction based on a utility's annual gross intrastate revenues. *Source:* <http://www.psc.ky.gov/>

PJM PJM Interconnection is a regional transmission organization (RTO) that coordinates the movement of wholesale electricity in all or parts of 13 states and the District of Columbia, an area that includes more than 51 million people. As of December 31, 2009, it had installed generating capacity of 167,326 megawatts (GW) and over 500 market buyers, sellers and traders of electricity. *Source:* <http://www.ferc.gov/>

RTO The purpose of a Regional Transmission Organization (RTO) is to ensure the efficient and reliable delivery of power across large areas. RTO's facilitate and promote efficiency in wholesale electricity markets and ensure that electricity consumers pay the lowest price possible for reliable service by removing transmission barriers between buyers and sellers. *Source:* <http://www.pjm.com>

SEPA The Southeastern Power Administration (SEPA) markets hydroelectric power generated by federal reservoirs to public entities in an 11-state marketing area in the southeastern United States. Total generating capacity in SEPA's area is 3,392 megawatts. The Administration's customers include 198 electric cooperatives, 292 public bodies, and 1 investor-owned utility. SEPA does not own transmission facilities; instead, it must contract with other utilities to provide transmission—or "wheeling"—services for the power it markets. *Source:* <http://energy.gov/>



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Thank you

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