



TASK XIII: MARKETPLACE OVERVIEW

SAMPLE ANSWERS

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Section I: Electric Industry

1. Does your country operate as one national electricity marketplace or do you have multiple regional electricity marketplaces?

The U.S. has never operated as one marketplace. It has historically been segmented in several ways. Today as a result of the deregulation (liberalization) of wholesale electricity and the deregulation and restructuring of some – but not all – state retail markets, the diversity of the overall U.S. market has increased and become more complex.

There are three types of electric utilities in the U.S.: Private, Investor-Owned Utilities (IOU), Public Power Entities are mostly municipalities but also include large wholesale entities such as the Tennessee Valley Authority (TVA) and Bonneville Power Authority (BPA), and Rural Electric Cooperatives (these were created by Federal Legislation early in the Century as a vehicle for facilitating the introduction of electricity service to rural areas, particularly in the West, where no electrical system previously existed.

Municipal utilities are governed by federal and state law and by their municipal government. Rural Cooperatives are similarly subject to law and also to the “membership” of the Cooperative. Neither are for the most part subject to electricity regulation.

The major governance of the investor-owned sector has been bifurcated, with wholesale electricity transactions being regulated at the federal level, by the Federal Energy Regulatory System. Retail electricity has been the purview of State Government through a regulatory body such as a Public Utilities Commission.

In 1992, Federal policy changes began to provide open access to transmission systems and liberalization of wholesale electricity transactions. Following this, many states took steps to open up their retail electricity market to competition and customer choice. In almost every state that moved forward, however, retail competition has not been successful if measured by the number of retail customers who have entered the competitive market. Where competition has taken hold, it has often as not been among commercial and industrial customers and not residential.

At the same time, wholesale markets have been bolstered by the creation of a merchant generation sector and by the evolution of a number of regional power pools, formerly focused mainly on coordination of dispatch, into Independent System Operators (ISOs). These entities are now taking steps to create regional market systems for various electricity products that will continue to grow wholesale marketplace transactions while also providing a foundation for liberalization of retail markets in the region.

Today, the U.S. has multiple marketplaces. Some are represented by the ISOs and feature formal trading exchanges with centralized dispatch. Some operate as traditional vertically integrated utilities with bilateral exchanges and regional reliability counsels. In the case of Municipal utilities and Cooperatives, as well as many IOU utilities in states that have not liberalized, the marketplace continues to be defined and operated under the governing structure under which it has operated for decades.

2. If you have multiple regional marketplaces, how many exist in your country? Please explain.

It is a little difficult to give an exact number of marketplaces because all areas of the country are not formally grouped. Formal regional system operators exist (ISO-NE, MISO, NYISO, ERCOT, CA ISO). Other regions such as the Southeast, the Pacific Northwest, and the Southwest operate on a coordinated basis, but they do not have centralized electricity markets or centralized system operators. These regions tend to operate on bilateral exchange with each utility responsible for its own control area dispatch.



3. What market actors perform the following functions in your marketplace:
(Please list and briefly describe)

a. Generation:

- i. There are vertically integrated utilities, municipal utilities, and cooperative utilities that own generation.*
- ii. Some non-utility generation operates under long-term sales contracts with utilities. Many of the plants in this segment have been cogeneration and/or renewable plants.*
- iii. There are independent power producers (IPP) that build generation plants for operation on a merchant (i.e. competitive marketplace) basis.*
- iv. Some end use customers own co-generation plants*
- v. Many end users have back up generators for emergency purposes*
- vi. There is some state (e.g. New York Power Authority) and Federal (TVA, BPA) ownership of generation.*

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b. Transmission:

- i. There are independent transmission companies that just own the transmission wires.*
- ii. There are vertically integrated utilities, municipal utilities, and cooperative utilities that own transmission lines, as well as distribution and/or generation.*
- iii. In some areas, the system operator is responsible for managing power flow over the transmission lines.*

c. Distribution:

- i. There may be a few exceptions, but all distribution lines are owned and maintained by the local distribution company (whether vertically integrated or not), municipal utility, or cooperative utilities.*

d. Retail customer services:

- i. Retail competition exists in some states throughout the country. If so, customers receive commodity service from either the local utility or a competitive supplier. Because of the slow rate at which customers are choosing competitive suppliers in these states, most customers in these jurisdictions are on "default service" in*

which their former retail provider continues to provide them with service but not under the former “obligation to serve” structure.

- ii. *If retail competition does not exist, then the customer receives commodity service from the local utility in the same manner as has historically existed.*

e. Reliability management:

- i. *All market players have some roll to ensure a reliable grid, but some have more defined roles than others. In the regions of the U.S. that are subject to “tight” control, generation suppliers to the regional grid normally have specific requirement for capacity, reserves, etc.*
- ii. *If there is a regional system operator in the market, this entity is generally responsible for grid reliability.*
- iii. *If there is not a system operator in the market, the local utility generally manages its own control area and regional standards are set by the regional North American Electric Reliability Council (NERC www.nerc.com).*
- iv. *Reliability is an area currently undergoing intensive policy review in the U.S., having been stimulated by the August 2003 Blackout in the Northeast and also reliability problems in California.*

f. Other (please describe):

4. What market actors’ work directly with the retail consumers (e.g. distribution company, competitive suppliers, energy service companies, etc)? Please provide brief description of their roles.

Retail consumers receive services from a number of different entities. If retail competition does not exist, then the customer receives commodity and distribution services from the local utility. If retail competition does exist, the consumer could receive commodity service from a competitive supplier and distribution services from the local utility. Billing services may be bundled with one of these two firms or it might be provided from both of them separately.

At the same time that many states were moving to liberalize retail electricity, some moved to “unbundled” other retail services such as metering and billing. Actual activity in these areas appears to be limited to date, however and some states have taken steps to reverse themselves in these areas.



There are hundreds (if not thousands) of various energy service companies. These firms provide things like lighting, HVAC, etc. Some utilities and competitive suppliers offer these services as well.

In some areas of the country, the US also has private businesses that are designed to provide curtailment/demand response services directly to end users.

5. Please list key regulatory players and their roles.

Federal Energy Regulatory Commission (FERC): Responsible for policy and transaction approval of wholesale electricity and transmission systems.

US Department of Energy: Primary mission is to advance the national, economic and energy security of the United States; and promote scientific and technical innovation in support of those goals.

State Regulatory Commissions: Responsible for all retail electricity policy and transactions, including the retail commodity and distribution system and services.

North American Electric Reliability Council: Responsible for setting reliability standards.

National and local Environmental Protection Agencies: Responsible for establishing and enforcing environmental standards that primarily affect the generation sector.

State and Federal Siting Authorities: Responsible for approval of siting and construction of generation, transmission and distribution facilities.

6. Please list key industry stakeholder groups (e.g. large customer associations, reliability organizations, trade associations, etc.)

Large energy users – They have associations at the Federal (ELCON), state and local levels.

Electric Utilities -- The Edison Electric Institute represents investor-owned utilities. The American Public Power Association represents the Public Power Sector. The National Rural Electric Cooperatives Association represents that sector. There are also state and regional associations of utilities.

State Regulators -- The National Association of Regulatory Utility Commissioners



represents regulators at the national level on key issues.

Competitive Electric Providers -- The National Energy Marketers Association represents competitive markets. The Electricity Power Supply Association (EPSA) represents the competitive generation sector. State and regional organizations also exist..

Renewable Energy - Primary organizations include the Solar Energy Industries Association (SEIA) and the National Wind Energy Association (NWEA). Many others also exist.

Technology Companies – Metering, software and enabling technology companies are represented by a variety of associations including the Automatic Meter Reading Association (AMRA); Energy management product and service companies are represented by the National Association of Energy Service Companies (NAESCO). The National Electrical Manufacturers Association (NEMA) represents technology companies that provide products and services to the transmission and distribution segments of the industry. Providers of energy efficiency products and services are represented by the Alliance to Save Energy.

Environmental Interests – The environmental NGOs that specialize in electricity are the National Resources Defense Council (NRDC) and Environmental Defense. There are many others. There are in particular strong and active organizations at the state and regional level.

Consumers – They are represented by organizations such as the Consumer Federation of America (CFA) but also are represented by many of the environmental NGOs. State and regional consumer groups also abound. Many states have a Consumer Advocate or Consumer Counsel separate from the Public Utilities Commission.

Demand Response – Two organizations represent the demand response industry – the Peak Load Management Association (PLMA) and the Demand Response and Advanced Metering Coalition (DRAM)

7. How many commercial, industrial and residential customers exist in your marketplace (add additional customer classes, e.g. agricultural, as needed)?

The following numbers are arbitrary, but indicative of the response we are seeking:

Customer Class	Number of Customers	Summer Peak Demand (MW)	Winter Peak Demand (MW)	Annual MWhs
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Commercial	4,000	15,000	14,000	105,000,000
Industrial	2,000	20,000	20,000	148,000,000
Residential	1,000,000	18,000	12,000	90,000,000

8. How many distribution companies operate in your marketplace? Please list the top five largest distribution companies.

There are approximately 2000 distribution utilities in the U.S. when all IOUs, Public Power entities and Cooperatives are counted. There are few Publics or Cooperatives with more than 100,000 customers. There are approximately 100 major IOUs.

Largest Distribution Companies	Number of Customers	Summer Peak Demand	Winter Peak Demand
Electric Co 1	10,000,000	25,000	18,000
Electric Co 2	8,000,000	20,000	22,000
Electric Co 3	7,000,000	18,000	18,000
Electric Co 4	5,000,000	16,000	15,000
Electric Co 5	4,000,000	12,000	10,000

9. If you have retail competition, how many competitive suppliers exist in your marketplace?

There are many competitive suppliers that operate across the U.S. Many only operate in one or more states or one particular region. It is estimated that less than 10 operate in all open markets. It is estimated that in total there may be in the range of 75-200 different companies.

10. If you have retail competition, what percentage of the summer and winter peak demands do competitive suppliers supply?

A sample answer: *The answer to this question will vary depending on the state in question. As a general rule, competitive suppliers serve between 30-60% of the peak demand. However, they more than likely do not serve the same proportion of customers given that most retail competition is focused on commercial and industrial users.*

11. What is the forecasted peak demand growth rate in your marketplace?



A sample answer: This depends on the region in question, but the range is approximately between 2-4% per year.

12. What is the projected supply (capacity) growth rate in your marketplace?

A sample answer: This depends on the region in question. It is also difficult to be precise because not all planned generation is actually completed. The range is approximately 1-3% per year.



Section II: Demand Response

13. Has demand response been attempted in your market? If so, please provide brief description of relevant successes and challenges.

Utilities in the U.S. have along history of providing load management programs. These included time-based pricing (primarily TOU), interruptible rates, curtailment programs and direct load control programs. The most active of these has been direct load control, particularly of customer HVAC and DHW systems. Many utilities continue to have these programs in place.

Today, the U.S. views demand response as the evolution of load management. New technologies (e.g. "smart thermostats) enable new types of end-use control and control of such by both the utility and the customer. Such technologies also allow new types of time-based pricing, including real-time pricing, day-ahead pricing and critical peak pricing.

In addition, some marketplaces have designed demand response solutions that allow demand response resources, by way of some market participant (e.g. utility, demand response aggregators, competitive retail supplier), offer the demand response to the market as a "supply" resource. When these programs are utilized they show direct benefits to the market and they have been growing on a year-by-year basis. However, they have not reached critical mass yet. Some have argued that this is because the compensation for participation is too variable thereby making it difficult to develop long-term business cases.

14. Which market actors might be most supportive of demand response in your marketplace? Please explain why.

There is widespread conceptual support for demand response in the U.S. among policy makers and, for the most part among electricity industry players. Translating that support into tangible demand response efforts continues to prove challenging, however, particularly in the area of funding of the technologies required to enable customers to participate in demand response.

Utilities are for the most part open to demand response but have legitimate concerns about revenue loss, customer loss and funding of programs that may provide benefits outside of their business or service territory.



Some utilities have even begun to use demand response for things like grid congestion and substation cost management. Both of these market actors also use demand response strategies to help mitigate supply portfolio risk.

Consumers, particularly large consumers, are in favor of demand response because they see it as a way to manage their total energy expenditures. Their interest tends to increase if they have clearly identified discretionary loads, properly permitted onsite/back-up generation, or they interconnected grid is in an emergency mode.

Some areas of the country have even seen the creation of demand aggregators. These firms aggregate up demand response resources as a way of creating "virtual power plants". They manage these resources in a similar way that an Independent Power Producer might manage their portfolio.

15. Which market actors would be the most likely to offer demand response services to the consumer? Please explain why.

It was expected that retail liberalization would lead to new market entrants not only for the provision of the commodity but also for new services, including in the area of demand response. This has happened to some extent but for the most part, due to their continued position as provider of electricity service and prices to the majority of customers, utilities can be expected to provide demand response to customers. The products and services for the utilities to be able to do so will largely come from demand response technology and service providers.

In the case of wholesale demand response and ISO demand response programs, the situation is different, with demand response providers dealing directly with customers and with the ISOs. Customer aggregation to create blocks of demand response is also beginning to occur.

16. Can demand response resources participate in electric market transactions today? If so, how?

Yes. There are established market rules that allow a market participant (e.g. utility, competitive supplier, demand aggregator) to sell demand response into the electric market just like other generation resources. The market rules establish the requirements for selling into the capacity, operating reserve and energy transactions. The market rules spell out response requirements, usage data submissions, and settlement processes.

17. What are the most important objectives for demand response? Please explain.



A sample answer: *Our country is interested in demand response as way to balance supply prices. We also think demand response resources are relatively inexpensive generation sources if properly managed and integrated into the market.*

18. Do energy consumers see different electricity prices at different times of the day? (Please explain in terms of how many and by class or size).

A sample answer: *This does occur, but it depends on the market. Some markets publish hourly price signal that can be seen by all market participants while some other markets do not have the same capabilities. In areas that do not have published hourly prices, some utilities have established time of use rates that are distributed to the consumer on a day ahead or intra-day basis.*

19. Have any energy efficiency and/or a demand response market potential studies been completed in your marketplace in the last ten years? Yes/No

If yes, please provide a reference location or attach the report.

A sample answer: *Our national research laboratory has published an energy efficiency study in recent years. It can be located at (www.website.com). Several utilities have performed private analyses, but these are not publicly available.*

We are not aware of any demand response market potential studies for our country.



Section III: Market Transactions

20. What type of electricity products traded in your marketplace (e.g. 5-minute spinning reserve, 30-minute non-spin, day ahead, capacity, hourly energy/spot, etc.)?

The actual product being traded has some variation depending on the marketplace in question. However, as a general rule our country trades spot energy, 5-minute spinning reserve, 5-minute non-spinning reserve, 30-minute operating reserve and day ahead hourly energy. Several derivations of capacity markets also exist.

21. Do you have a central trading exchange in your marketplace?

The U.S. has several marketplaces in our country. Some marketplaces utilize central trading exchanges and some operate almost entirely on a bilateral basis.

22. How are reserve margin targets established in your marketplace? Please explain.

In cases where there is a system operator, that entity, in cooperation with the government, set reserve margin requirements. These requirements are updated annually. The requirements are based on expected supply and demand growth, projected weather conditions and grid constraints. Resource adequacy, whereby sufficient resources to ensure reliability are planned for and provided, is an important area of focus in the U.S. at present and the integration of demand response into such is under discussion.

23. What is the current reserve margin target in your marketplace?

The reserve margin target varies by region, but it generally runs between 16-22%.

24. Does your market currently exceed or fall short of the current reserve margin target? Please explain.

This depends on the region in question. Some areas are expected to have sufficient capacity for the next five years, while other areas are expected to require additional resources to ensure adequacy of supply and reliability of the grid. As noted in the response to Q.23 above, there is increasing discussion and analysis in the U.S. over how to best optimize all parts of the reliability equation – generation, transmission infrastructure, and demand side resources