

Peak Load growth along the Wasatch Front: What's Driving Electricity Demand in Utah?

Research Report #663, January 2004

Lesson Summary

This lesson addresses issues of supply and demand in the electricity market. The report explains the differences between average demand and peak demand, and the special challenges associated with supplying the peak load. The report also explores the economic and demographic causes of the growing demand for electricity in Utah.

Related Websites

- Utah Power
<http://www.utahpower.net>
- Energy Information Administration (official energy statistics from the U.S. Government)
<http://www.eia.doe.gov/>
- Peak Load Management Alliance
<http://www.peaklma.com>

Utah Core Curriculum

U.S. Govt. and Citizenship

- Std 5, Obj 2: Determine how supply and demand affect the availability of goods and services.

Economics

- Std 6, Obj 1: Explain how the scarcity of productive resources including, natural, human, and capital goods requires the development of economic systems to make basic decisions about how goods and services are to be produced and distributed.

This lesson plan is provided by Utah Foundation to assist in using the accompanying Research Report in high school or middle school classes. Please feel free to copy the Research Report for your students.

Vocabulary

Confluence: A body formed by different factors flowing together.

Demographic: Characteristics of a population, such as age, gender, education level, etc.

Infrastructure: The whole system of facilities, equipment, and services needed for a city or state.

In-migration: People moving into an area.

Median: The middle number in a set of data, often used to depict the average.

Paradox: A true statement that sounds false or contradictory.

Peak Load: The greatest amount of electricity needed at any one time.

Regression Analysis: Correlation of data to allow prediction of an outcome based on other data.

Retrofit: Modifying equipment to make improvements or bring it up to newer standards.

"Spot" Market: A forum for buying from other suppliers at their current rates.

Quick Questions

1. Electricity use in this state has wide swings from high to low demand. Why is it so important to increase the size of power generators since the peaks occur so rarely?

Answer: Because electricity cannot be stored, the power must be available immediately when needed.

2. Which common household and business activity uses the most electricity?

Answer: Air Conditioning.

3. Describe the difference between average load growth and peak load growth.

Answer: Average load growth can be thought of as predictable growth from population or business expansion. Electric companies can predict the rate and build accordingly. Peak load is more variable, based on behavior, and is more difficult to predict.

4. When are outages most likely to occur?

Answer: During times of peak use, usually in the summer because of air conditioning.

5. What options do utility companies have to meet peak demand?

Answer: They can “fire up” other generating plants or buy energy from other sources.

6. How does using these options affect costs to consumers?

Answer: Both options cost more and increased costs are passed on to consumers.

7. What factors are causing the surge in peak load needs?

Answer: Hot dry summers, drought, population growth and a booming economy.

8. Which of these three factors is the best indicator of growth in electricity consumption?

Answer: Economic growth.

9. What percentage of homes in Salt Lake has air conditioning?

Answer: 57% have air conditioning. 37% have central air conditioning.

10. What are the largest types of electric usage for commercial buildings?

Answer: Air conditioning, interior lighting, “other,” hot water, exterior lighting and cooking.

Critical Thinking Activities

1. Utah Power has been trying to convince customers to adopt a program to allow Utah Power to cycle residential air conditioners on and off during peak times. Consumers are skeptical and feel that this plan would compromise the comfort they have come to expect from their air conditioner. Assume that you were the new head of marketing for Utah Power. Your assignment is to educate consumers about peak cycles and energy costs and sign them up for this cycling service. Develop an effective advertising plan and present it to the class for discussion.
2. What options are available to handle peak electricity loads? Evaluate each of the options available and decide which you think would be the most cost efficient and provide the best service for Utah customers. Write a short report showing the pros and cons of your recommended solution.

Quiz Page

Vocabulary

Confluence	Median	“Spot” Market
Demographic	Peak Load	
Infrastructure	Regression Analysis	
In-migration	Retrofit	

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