

MINUTES OF THE HOUSE ENERGY AND UTILITIES COMMITTEE

The meeting was called to order by Chairman Carl Holmes at 9:00 A.M. on January 16, 2007 in Room 241-N of the Capitol.

All members were present except:

Oletha Faust-Goudou- excused

Committee staff present:

Mary Galligan, Kansas Legislative Research
Dennis Hodgins, Kansas Legislative Research
Jason Long, Revisor's Office
Rena Hansen, Committee Assistant

Conferees appearing before the committee:

Mark Parkinson, Kansas Lieutenant Governor, Kansas Energy Council Co-Chair
Ken Frahm, Kansas Energy Council Co-Chairs
Kimberly Gencur, ITC Great Plains

Others attending:

See attached list.

Report by Kansas Energy Council, Mark Parkinson, Kansas' Lieutenant Governor, and Ken Frahm, KEC Co-Chair, ([See Kansas Energy Council for Document](#)). Ken Frahm, KEC Co-Chair, spoke to the committee on the Kansas Energy Council (KEC), noting that the governor has added legislators to the KEC. He also spoke on Conservation and Efficiency Education and a possible requirement that the utilities would make this part of their "agenda". This would require that someone submit legislation to ensure this was done. Second, KEC wants to work on the demand side program which deals with improving an existing energy efficiency notification program for new homes, and disclosure of the efficiency of said home at the time of the closing of the home sale. They advocate that the disclosure form would be in a better, more readable format. The concept is to help consumers make informed decisions. Third, KEC would encourage, but not require, utilities to offer a PAYS program through which utilities offer to purchase an old worn out furnace and replace it with more efficient furnace that would stay with the property, with a payment back to the utility per month, billed in the consumer's monthly billing statement.

Lieutenant Governor Parkinson spoke on the Kansas Energy Plan. He spoke about the supply side of energy, specifically talking on wind energy. The potential for wind in Kansas is great. One of KEC's goals and beliefs is that with a combination of efficiency, and wind we can offset the increasing need for power. Two answers why we don't have wind: lack of certainty on the utilities that they will get the rate of return they need to survive as an economic entity, and second, is the lack of transmission to get the wind from its prime wind location to the places where it is needed. KEC focused this year on the utility issue. One recommendation is that KCC should consider the inherent value of wind when looking at rate of return filings. KEC is using every means possible to get that message to the KCC without legislation. Second, is to encourage the legislature to consider legislation that would give tax incentives for building wind.

Concerning transmission: If everything went perfectly it would take 4-5 years to get the transmission lines we need constructed. The State of Kansas through assorted energy and legislative organizations need to get the various groups together that want to build lines and have them work together. The Energy Council's goal is 10% renewable by 2015 but, the governor has taken a more aggressive approach of 20% by 2020. Once the transmission lines are built and KCC recognizes the cost of wind in rate cases we can, in fact, reach even the governors goal.

Additionally, KCC is looking at alternative energy sources and will recommend tax incentives when IGCC becomes a viable technology. They are also working with the bio-fuels industries and universities to get Kansas on the cutting edge.

Finally, it was commented that we, as a state and nation, have a challenge with renewable energy, but it is certainly a solvable challenge.

CONTINUATION SHEET

MINUTES OF THE House Energy and Utilities Committee at 9:00 A.M. on January 16, 2007 in Room 231-N of the Capitol.

Questions were asked and comments made by Representatives: Annie Kuether, Peggy Mast, Cindy Neighbor, Josh Svaty, Tom Hawk, Tom Sloan, and Tom Moxley.

KEC also offered a list of the KEC members (Attachment 1).

Briefing on: Sunflower Bio-Refinery- Trevor KcKeenan, (Attachment 2), PowerPoint presentation, Kansas Bioscience Authority NISTAC (National Institute for Strategic Technology Acquisition and Commercialization), specifically focusing on the Sunflower Electric Power Corporation and their proposed plant in Holcomb. He noted that as the authority looks across the state, Holcomb offers a lot of advantages for the state. Holcomb will be one of the largest facilities of its' kind in the country. The goal of the plant with the integrated facility is that as prices fluctuate, they will have a more efficient system than without the integration. A multi-level approach makes sense for this plant with many diverse interactions between the systems. The current plant looks like the chart you see in the PowerPoint with the future having some links drop off and others added on, based on the best system to be used at the time. Sunflowers' goal is to scout the country and world looking for the best and newest technology. The challenge will be permitting the differing energy producing mechanisms and getting everything in line to get these plants up and running.

Questions were asked and comments made by Representatives: Don Myers, Josh Svaty, Terry McLachlan, Tom Moxley, Carl Holmes, Tom Hawk, and Bill Light,

Kimberly Gencur, ITC Great Plains, (Attachments 3 and 4) prepared documentation for the committee on "Energy 101" and a sheet to help members learn energy/utilities acronyms.

Rep Tom Sloan moved bill requests: first, to survey of households and business in state to determine if broad band system is functioning in certain areas and second, another bill whereby Ft. Riley and other military installations in Kansas would partner with energy conservation projects identified in the United States energy upgrade program allowing KDFEA to sell bonds for these upgrades. Seconded by Representative Annie Kuether. Motion carried.

Representative Holmes updated the committee on what KETA (Kansas Electric Transmission Authority), has been working on in regards to transmission this past year. The second meeting for KETA in 2007 is scheduled for February 2, 2007, 1 pm, at the KCC building.

Questions were asked by Representatives: Don Myers and Annie Kuether.

The next meeting is scheduled for January 17, 2007.

Meeting Adjourned.

HOUSE ENERGY AND UTILITIES COMMITTEE GUEST LIST

DATE: January 16, 2007

NAME	REPRESENTING
MARK SCHREIBER	Westar Energy
Lindsey Douglas	Hein Law Firm
Kimberly Shew	ITC (Great Plains)
PHIL WAGES	KEPCO
LARRY BERG	MIDWEST ENERGY
Corey Mohn	Ks Dept. of Commerce
Tom Thompson	Sierra Club
TOM PALACE	FMIA OF KANSAS
Carole Jordan	Ks D of Ag
Paul Snider	Kansas City Power & Light
Luke Bell	Kansas Association of REALTORS
Allison Green	Intern
Patrick Kugiel	Olsinelli Law
Tom Bruno	EKO GA
Mary Jane Staniewicz	KAEP
Kate Zubaus	Kearney & Associates
Artur Bagiyants	Intern
Rob Freeman	Treueland Energy
Hslee Kaufman	Ks Coop Council

Kansas Energy Council Members

Ken Frahm, KEC Co-Chair	Electricity from Renewables
Mark Parkinson, KEC Co-Chair	Lieutenant Governor
Richard Anderson	League of Kansas Municipalities
Roderick Bremby	Secretary, Department of Health and Environment
Tim Carr	Designee of the State Geologist
Patricia Clark	Designee of the Secretary of Commerce
David M. Dayvault	Energy Tax and Revenue Specialist
Sarah Dean	Energy and Environmental Issues
Joe Dick	Municipal Electric Utilities
Stephen Dillard	Oil Producers
- Jay Emler	Kansas Senate
- Carl Holmes	Kansas House of Representatives
Jeffrey Kennedy	Natural Gas Producers
Gregory Krissek	Energy and Agriculture
- Janis Lee	Kansas Senate
Stuart S. Lowry	Rural Electric Cooperatives
Galen B. Menard	Petroleum Refiners
Gene L. Merry	Association of Counties
Deb Miller	Secretary of Transportation
Brian J. Moline	Kansas Corporation Commission Chair
Richard G. Nelson	Renewable Energy Resources
Adrian J. Polansky	Secretary of Agriculture
Mark Schreiber	Investor-owned Electric Utilities
- Tom Sloan	Kansas House of Representatives
Bruce Snead	Energy Efficiency and Conservation

ENERGY AND HOUSE UTILITIES

DATE: 1-16-07

ATTACHMENT 1-1

Kansas Energy Council Members

David R. Springe

Consumer Counsel, CURB

— Josh Svaty

Kansas House of Representatives

Mark Taddiken

Kansas Senate

Michael J. Volker

Energy Economist

Steve Weatherford

Kansas Department Finance Authority

Curt Wright

Petroleum Marketers

Sunflower Integrated Bioenergy Center

SIBC

Kansas Bioscience Authority

NISTAC

(National Institute for Strategic Technology Acquisition and
Commercialization)



Sunflower Electric Power Corporation

A Touchstone Energy® Cooperative



ENERGY AND HOUSE UTILITIES

DATE: 1-16-07

ATTACHMENT 2-1

NISTAC

- **Founded in 1994 as a nonprofit under the auspices of Kansas State University and the Kansas Technology Enterprise Corporation (KTEC)**
- **Commercialization of intellectual property from:**
 - Kansas State University
 - Corporate patent portfolio
- **Promote business development in Kansas and around the nation through the use of technology**

SIBC

Kansas Bioscience Authority

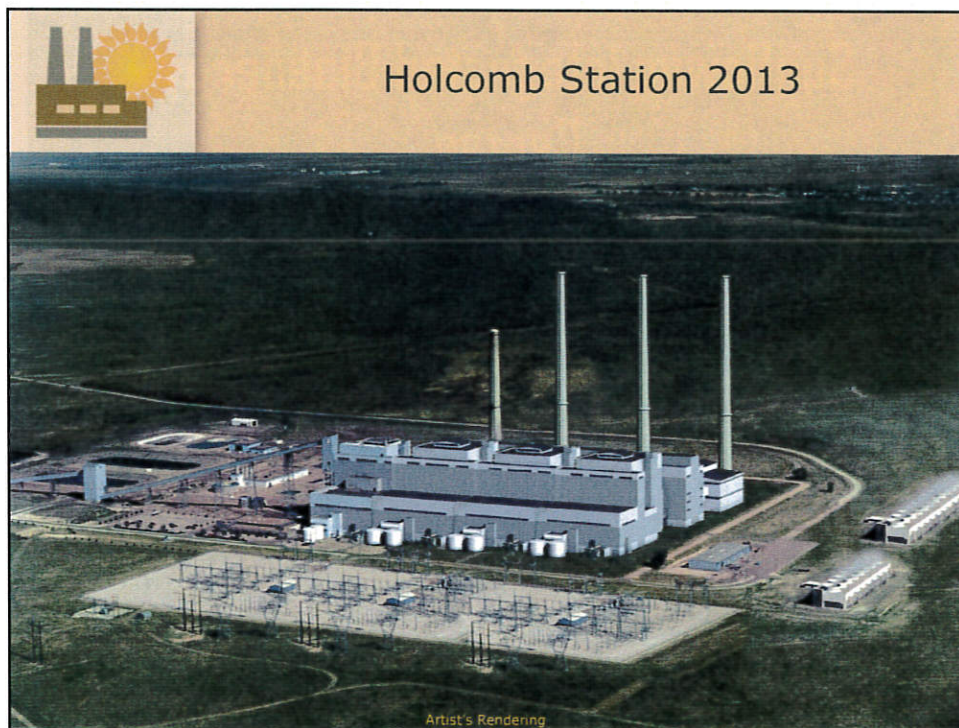
- **Created in April 2004 under the Kansas Economic Growth Act**
- **Independent entity of the state with the authority to invest \$580 million in bioscience activities**
- **Mission to make Kansas a national leader in bioscience development and commercialization**

SIBC

Sunflower Electric

- Nonprofit corporation formed in 1957 by six rural electric distribution cooperatives
- Services 34 western Kansas counties with over 61,000 meter points
- Actively engaged in rural development activities throughout western Kansas for many years

SIBC





Holcomb Expansion Project

- Total installed cost of the three plants is expected to be \$3.6 billion
- Over a 35-year period will exceed \$8 billion
- Construction Impact (6 year period)
 - 3,600 jobs created (direct and induced) in Kansas
 - Annual payroll of more than \$116 million
- Continuing Impact (35-year study period)
 - More than 400 full-time jobs (direct and induced) created in Kansas
 - Annual payroll of more than \$24 million

Studies completed by Dr. Ralph Gamble, a noted Fort Hays State University Economics professor

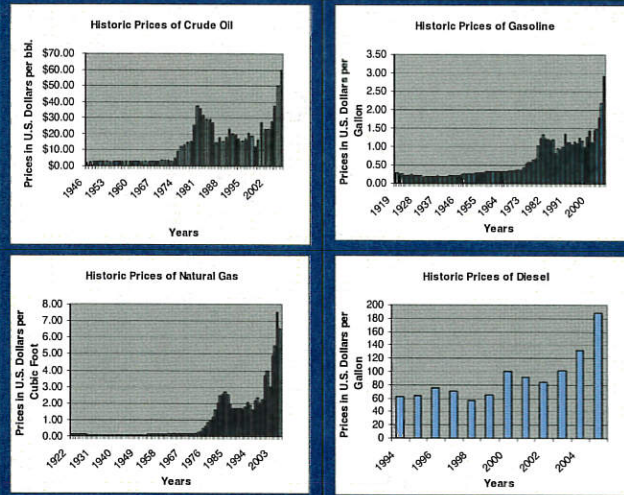
Sunflower Integrated Bioenergy Center

- *Goal is to develop a bioenergy project that will integrate a number of commercial or near commercial renewable energy technologies with the coal-based power plant located at Holcomb Station*

SIBC

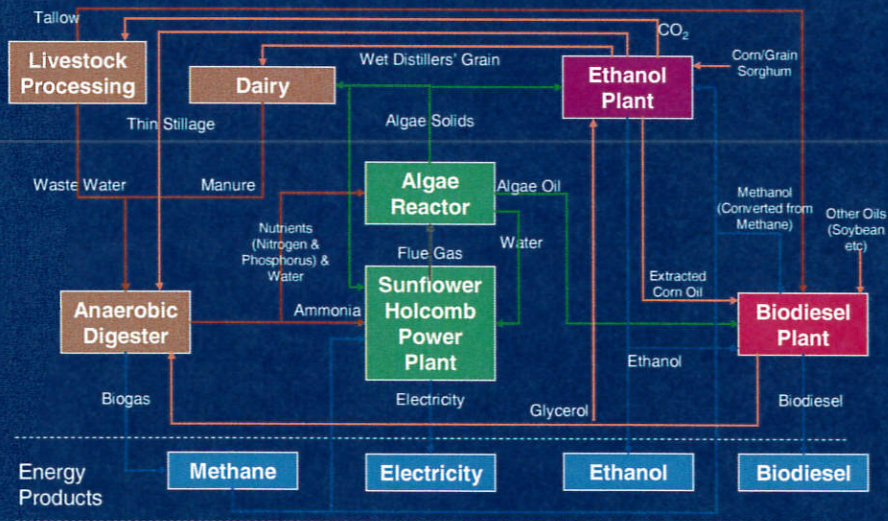
Global Energy Markets

Comparative Historic Prices of Fuel Alternatives



SIBC

Sunflower Integrated Bioenergy Center

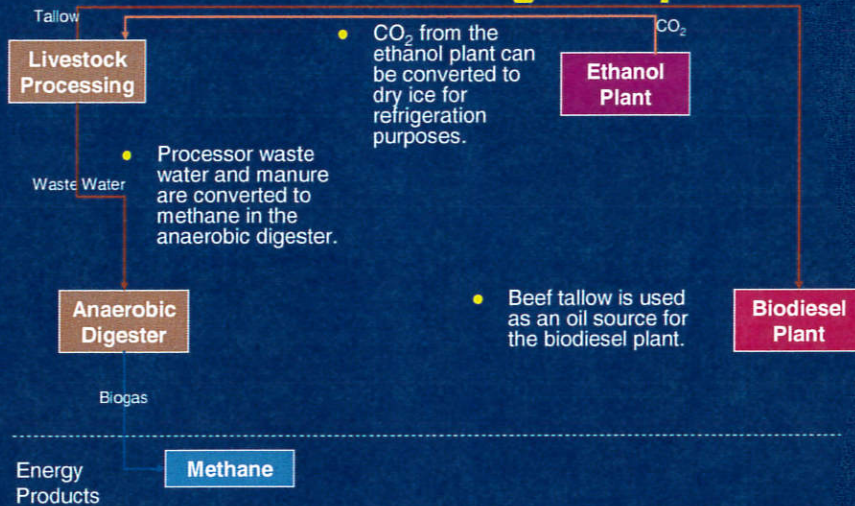


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Reduced Waste Streams = CO₂, NO_x, SO_x, Nutrient Load (Nitrogen & Phosphorus), Heat, & Waste Water

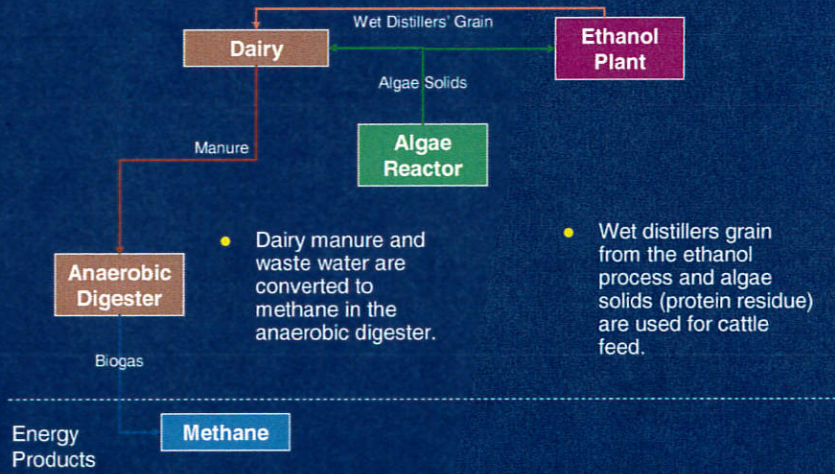
Patent Pending

Livestock Processing Subsystem



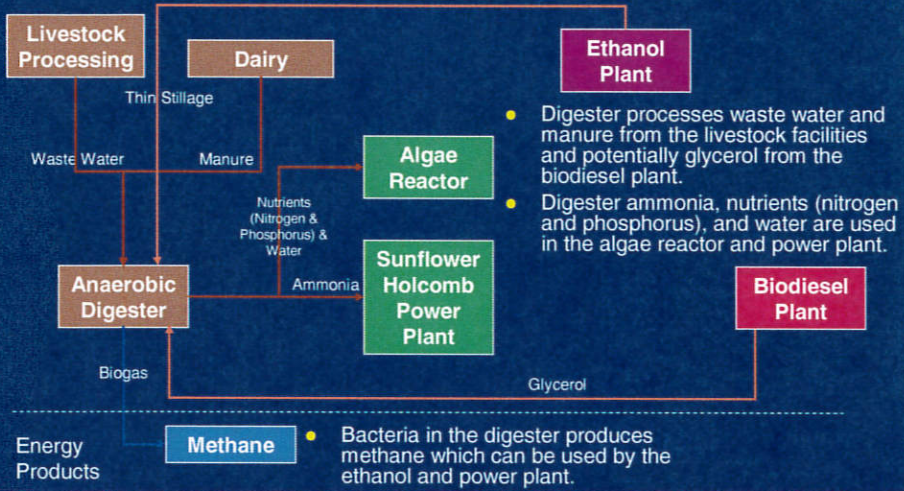
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Dairy Subsystem



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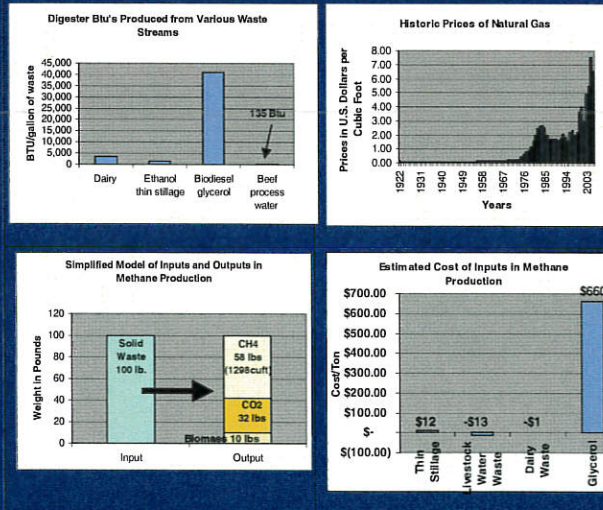
Anaerobic Digester Subsystem



SIBC

Methane

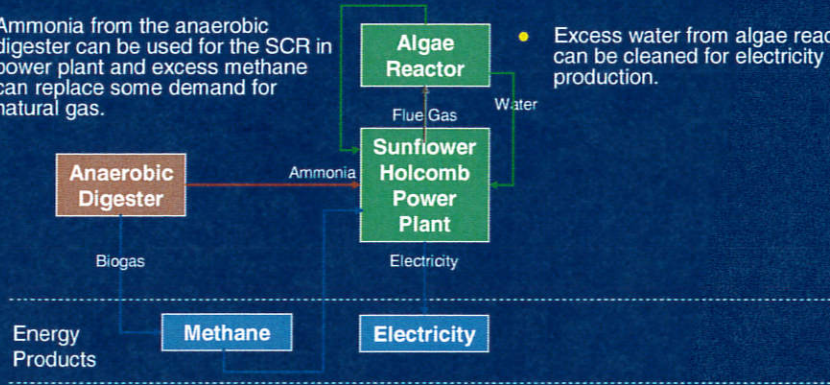
Methane Digester Market and Process Data



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Coal-based Power Plant Subsystem

- Flue gas emissions from the power plant are stripped as they flow through the algae reactor creating algae oil and solids.
- Ammonia from the anaerobic digester can be used for the SCR in power plant and excess methane can replace some demand for natural gas.
- Excess water from algae reactor can be cleaned for electricity production.

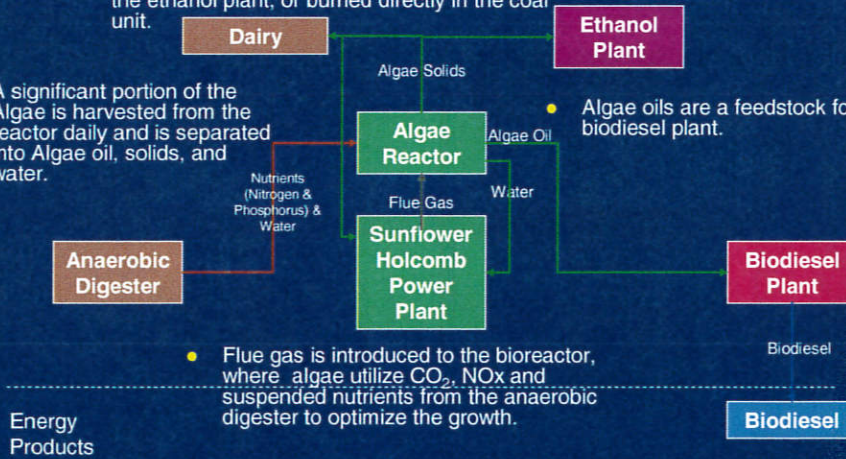


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Algae Subsystem

Converts CO2 emissions into renewable fuels

- Algae solids are used as animal feed, starch for the ethanol plant, or burned directly in the coal unit.
- A significant portion of the Algae is harvested from the reactor daily and is separated into Algae oil, solids, and water.
- Algae oils are a feedstock for the biodiesel plant.
- Flue gas is introduced to the bioreactor, where algae utilize CO₂, NOx and suspended nutrients from the anaerobic digester to optimize the growth.



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Algae Reactor

Converts CO₂ emissions into renewable fuels

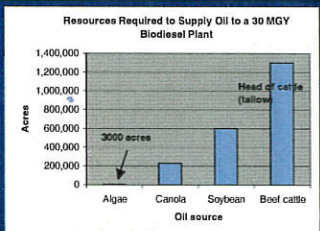
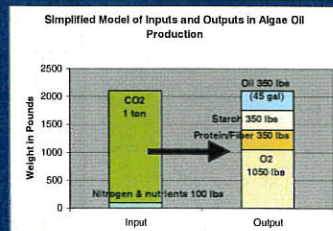
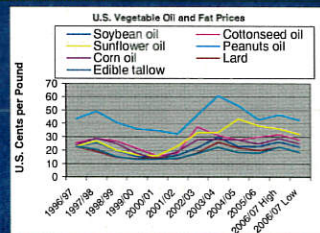
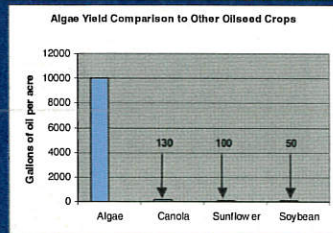
- Microalgae is the most primitive plant form - typically one or two cells.
- This simple structure allows algae to be very efficient at converting sunlight, CO₂, and nutrients into oil (for biodiesel) and starch (for ethanol).
- The algae reactor is capable of utilizing the waste CO₂ and NOx in flue gas and the nutrients from livestock/processing waste to create valuable energy products.
- Algae systems have been research for decades including work by the National Renewable Energy Laboratory. Production was found to be viable but most work was done when fuel prices were half of what they are today.
- No large scale algae reactor is in operation today but significant investment has been made recently in conjunction with higher global energy costs.



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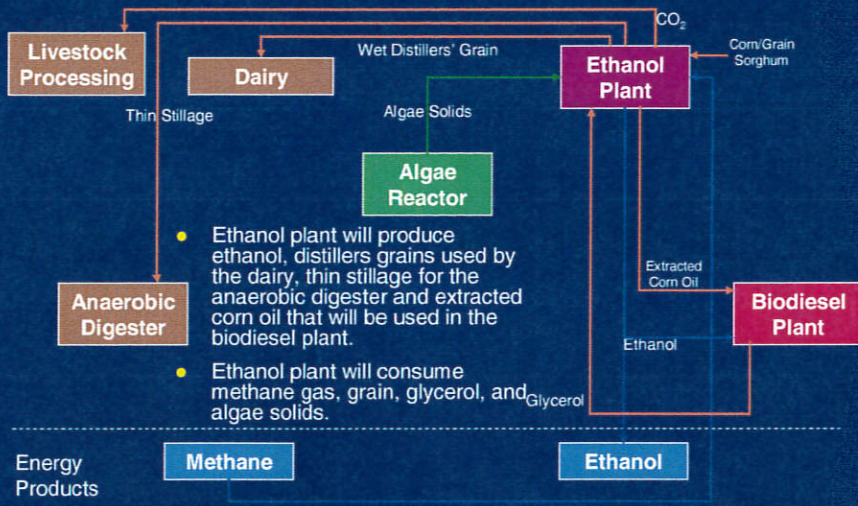
Algae

Algae Market and Process Data



SIBC

Ethanol Subsystem

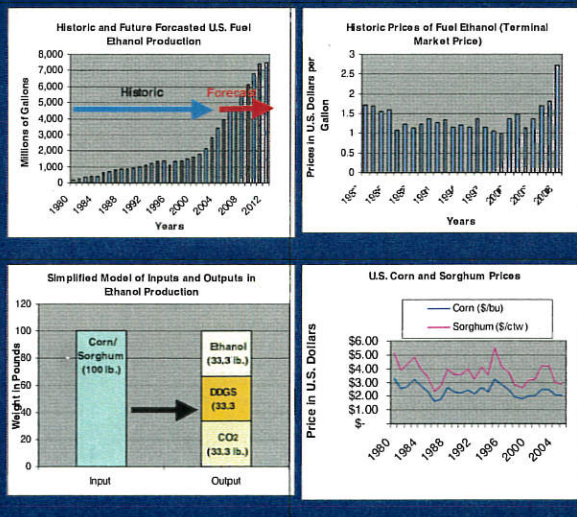


- Ethanol plant will produce ethanol, distillers grains used by the dairy, thin stillage for the anaerobic digester and extracted corn oil that will be used in the biodiesel plant.
- Ethanol plant will consume methane gas, grain, glycerol, and algae solids.

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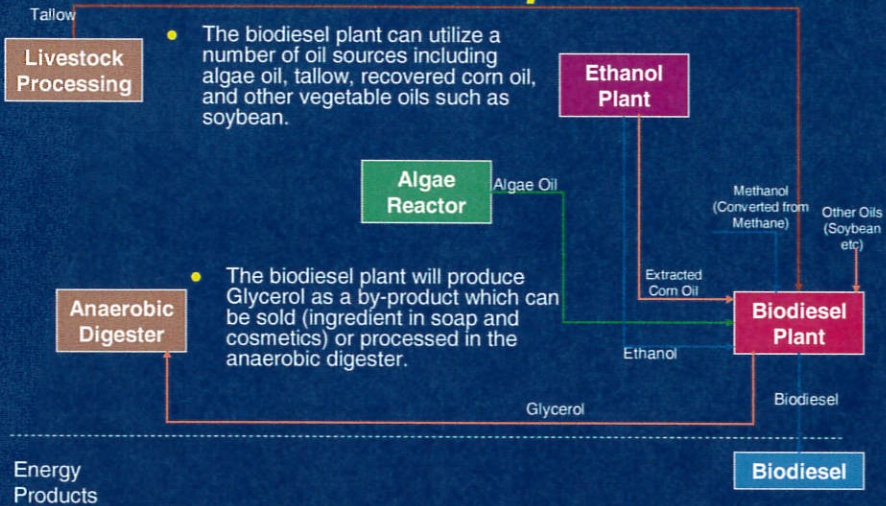
Ethanol

Ethanol Market and Process Data



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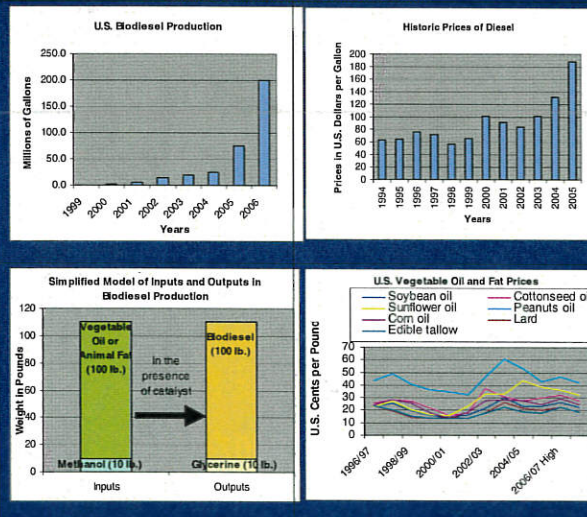
Biodiesel Subsystem



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Biodiesel

Biodiesel Market and Process Data



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Expected Benefits

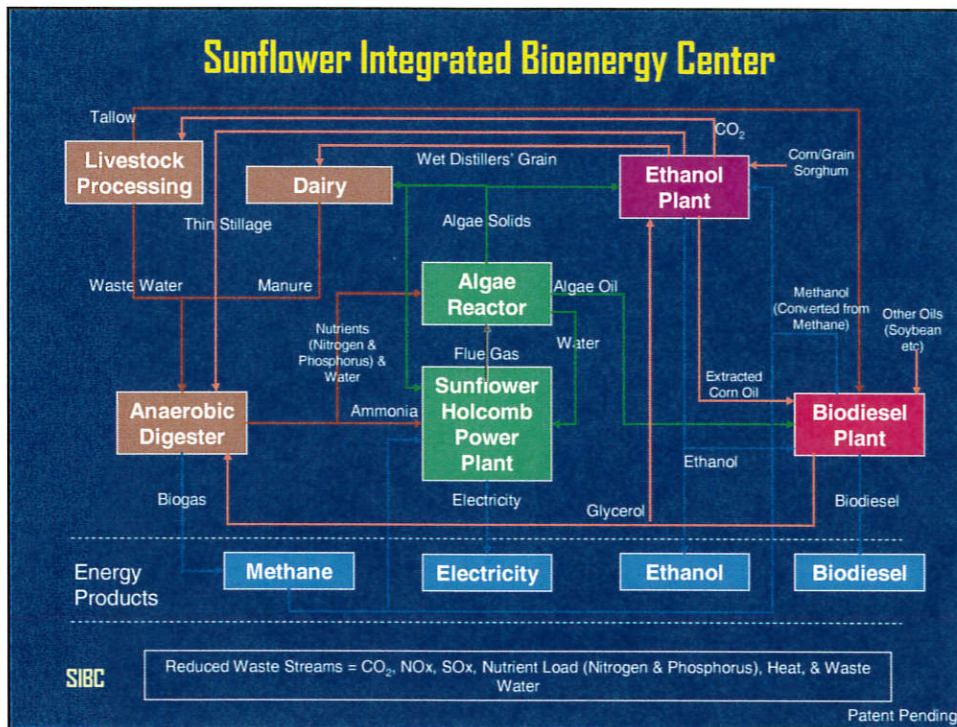
- **Efficiencies of integration**
 - Improved economics over stand-alone system
 - Water re-use
 - Value from waste streams
 - Flue gas utilization
- **New job creation**
- **Additional regional economic activity**
- **Shared human resources**

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Current Status

- **Formation of founding partners company**
- **Final technology and financial partner selection**
- **Enhanced subsystem feasibility studies**
 - Economic
 - Engineering for integration
 - Environmental / water
- **Ethanol plant construction 2007**

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Commonly Used Electric & Natural Gas Utility Acronyms

AC/DC- Alternating Current vs. Direct Current- AC is electric current that reverses direction at regularly reoccurring intervals of time. AC can be easily converted into higher or lower voltages. DC is electric current that flows in one direction, remaining as close to constant "magnitude" or a certain flow as possible. States west of Kansas operate on AC energy whereas Kansas and states to the east operate on DC energy.

AGA- American Gas Association, a Washington D.C.-based national trade organization of investor-owned natural gas utilities that provides industry information and monitors regulatory changes and political developments.

Bcf- One billion cubic feet, a common measure of natural gas.

Btu- British Thermal Unit- The quantity of heat required to raise the temperature of one pound of water one degree Fahrenheit at a specified temperature. ** Note glossary for further definitions such as Mcf, MMBtu, Therm, etc.

CURB- Citizen's Utility Ratepayer Board is a state agency designed to protect the interests of residential and small commercial utility ratepayers in the state of Kansas.

DOE- U.S. Department of Energy

DSM- Demand Side Management- Any effort aimed at getting customers to use less electricity during peak demand periods, like during and after dinner during the hot summer months or the cold winter months. It includes conservation efforts or load control such as incentives to use less electricity or natural gas.

EI – Edison Electric Institute, a Washington D.C.-based national trade organization of investor-owned electric utilities that provides industry information and monitors regulatory changes and political developments.

EPACT 2005- A comprehensive energy bill that was passed by Congress in 2005 call the Energy Policy Act of 2005.

FERC- The Federal Energy Regulatory Commission, an agency within the Department of Energy that regulates and oversees interstate electricity sales, electric rates, hydroelectric licensing, natural gas transmission, gas and oil pipeline rates and investor-owned utility transmission.

FPC- Federal Power Commission- The federal agency that preceded the FERC.

IOU- Investor Owned Utility- a utility that has stockholders

IPP- Independent Power Producer- A producer of electricity not affiliated with the local utility selling the power.

ISO- Independent System Operator- An entity that controls and administers access to electric transmission in a region or state or across several systems, on a non-discriminatory basis for a number of independent utilities.

ENERGY AND HOUSE UTILITIES

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ATTACHMENT 3-1

ITC- Independent Transmission Company- a FERC-regulated transmission-only utility that builds, operates, maintains and finances the transmission infrastructure.

KCC- The Kansas Corporation Commission, a state agency that regulates rates, service and safety of public utilities, common carriers, motor carriers, and regulates oil and gas production by protecting correlative rights and environmental resources

KEC- The Kansas Energy Council is charged with development of a comprehensive state energy plan, information about the state's energy resources and recommendations on long-term energy policy to the Governor, Legislature, and Kansas Corporation Commission.

kV- Electrical potential equal to 1,000 volts. Transmission lines are referred to as 34.5kV, 115kV, 345kv, etc...

LDC- Local Distribution Company, which is a utility that obtains the major part of its income from a retail distribution system for the delivery of natural gas or electricity to end-users. Said plainly, it's the company that supplies your home with electricity or natural gas in exchange for your money.

NERC- The North American Reliability Council- A power industry alliance formed in 196 as a result of the massive 1967 New York City blackout. Its purpose it to make sure that kind of event doesn't occur again. NERC is composed of 10 regional councils and includes virtually all the power regions of the contiguous United States, Canada and part of Mexico.

NRC- The Nuclear Regulatory Commission- A federal agency that licenses and regulates U.S. nuclear power plants.

OASIS- Open Access Same-Time Information System- The short answer is a FERC-sanctioned method of information sharing. If you own a transmission line this is how you tell your customers when you have available transmission capacity to sell. It's the power company's version of Ebay.

RPS- Renewable Portfolio Standard- a mandate that a percentage of a utility's, municipal's or cooperative's energy load shall be composed of renewable energy.

RTO- FERC-mandated regional organizations charged with managing the transmission power in a region of the country.

SPP- Southwest Power Pool- the regional transmission organization with planning responsibility for Kansas and much of the Great Plains region.

NOTE: Please see a separate reference for Telecommunications Industry acronyms. It is impossible to begin to list all of them in a brief reference document.

Utility Lingo Simplified

The unique language of energy in
the utility business.

ENERGY AND HOUSE UTILITIES

DATE: 1-16-2007

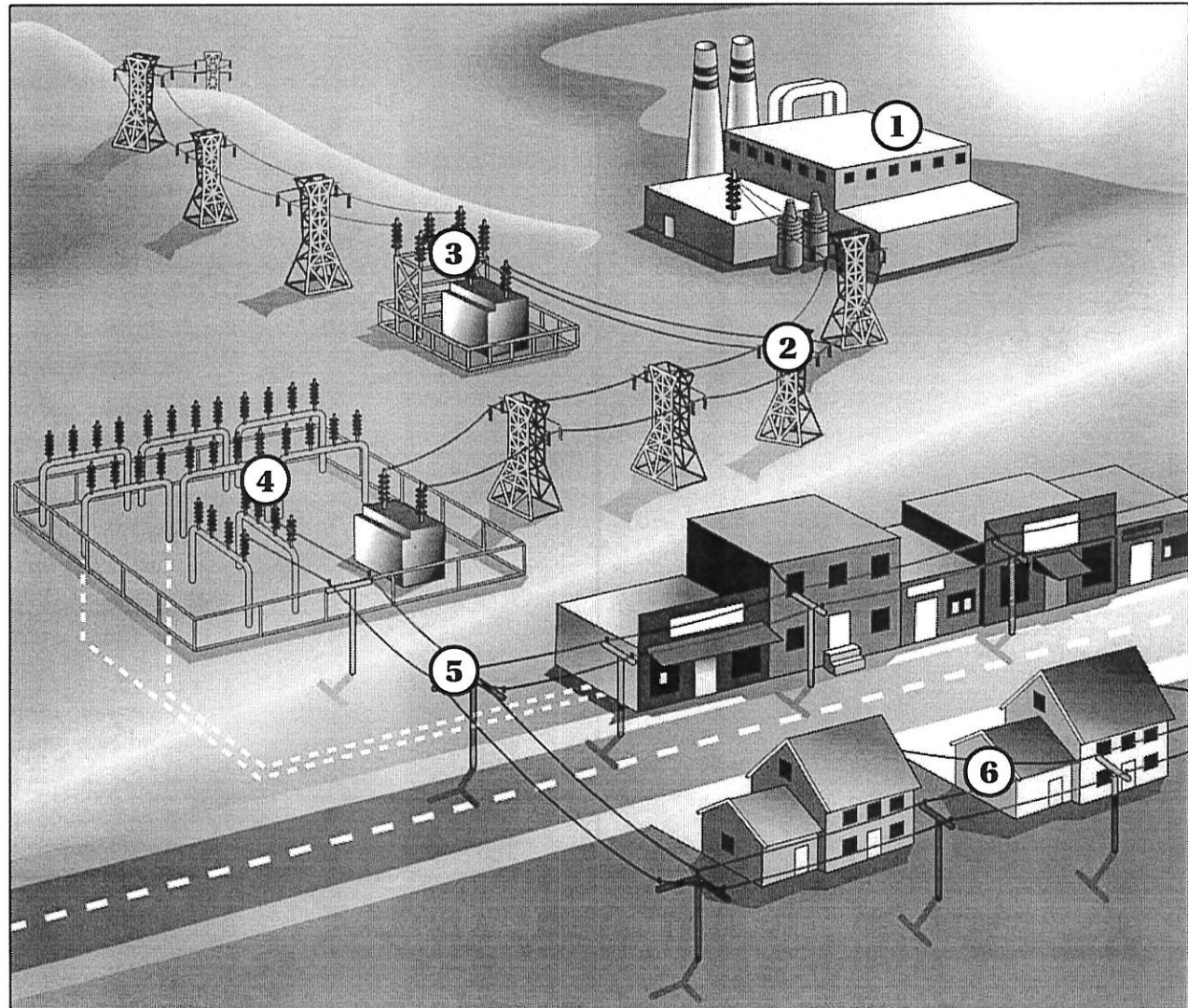
ATTACHMENT 4-1

How Does An Electric System Work?

Electric systems are designed to supply customers with safe, reliable and affordable energy. But doing that requires a number of complex processes and systems. Of course not all systems are designed exactly alike because each community has its own special needs, as well as its own special geography. However, the basic components are the same:

1. **Power plant** – Electricity starts here, produced by spinning generators that are driven by water, a diesel engine, or a natural gas or steam turbine. Steam is made by burning coal, oil or natural gas or by a nuclear reactor. When needed, extra power is brought into an electric system from plants outside the area.
2. **Power grid** – Electricity is carried over a network, or “grid,” that connects power plants to a substation and from there to distribution lines that take the power to homes or businesses.
3. **Transmission substation** – These facilities look like giant erector sets connected to wires from the power plant. Here large transformers increase voltage from thousands to hundreds of thousands of volts so the power can be sent over long distances.
4. **Distribution Substation** – You see them around towns and cities. They are those small fenced-in areas that have electric lines coming in and going out. Inside these fenced-in areas are transformers that reduce voltage to a lower level so the power can be sent out on distribution lines to the surrounding community.

5. **Distribution system** – Includes main or primary lines and lower-voltage or secondary lines that deliver electricity through overhead or underground wires to homes and businesses. You see these lines every day on poles alongside roads and streets.
6. **Service connection** – That’s the line that connects to the meter on the side of homes and businesses. The meter is used to determine how many kilowatt-hours are used by each customer.

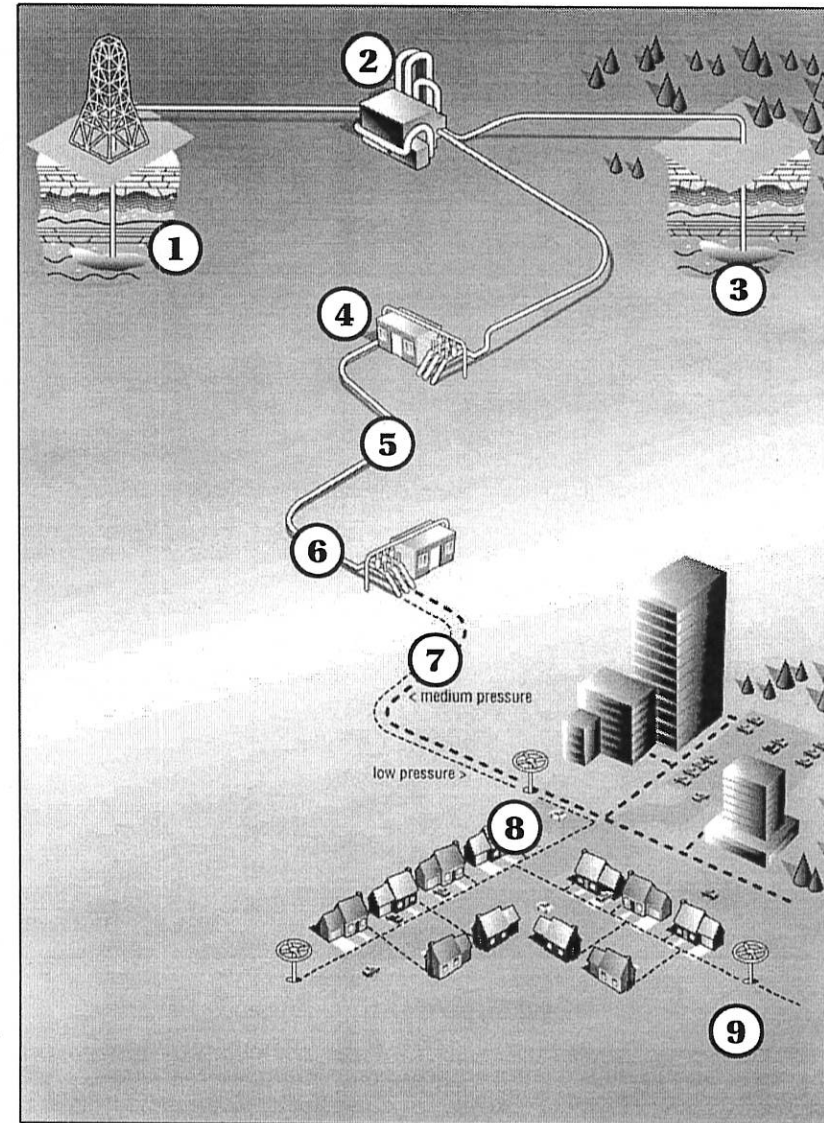


4-2

How Does A Gas System Work?

Natural gas systems are relatively simple in concept. What's complicated is designing them to be as safe and secure as possible for use as an energy source in homes and businesses. The simple concept is: You take the gas out of the ground and use pipelines to get it to customers.

1. **Wellhead** – Natural gas is flushed out of the ground. The pressure of the gas where it exists underground pushes it to the surface after the well is drilled.
2. **Treatment facility** – Once out of the well, the gas is treated to remove any sand, dust, contaminants, water or condensed petroleum liquids.
3. **Storage facility** – Natural gas is compressed and injected into underground storage facilities (like depleted salt caverns or old gas fields) between April and October when demand is low. In colder weather months, the gas is brought back into the distribution system as needed. Purists in the business like to say it's "drawn out."
4. **Compressor station** – Increases gas pressure to keep it moving through a network of underground pipelines.
5. **High-pressure pipelines** – Transport gas to distribution systems, often across long distances. The pipelines can range up to 48 inches in diameter.
6. **Regulator station** – Reduces the pressure of the gas as it enters the distribution system and injects an odorant into the gas so it can be smelled in the event of a leak. Natural gas otherwise is odorless.
7. **Distribution system** – Takes the gas from the regulator station to cities, towns and communities.
8. **Individual pipe and meter connection** – Connects homes and businesses to the distribution system. A gas meter measures the amount of gas consumed by the customer.
9. **Safety valves** – Used to shut off gas to specific areas during construction and emergencies.



Energy

The Lingo Of Utilities

Access Charge – In 1996, the Federal Energy Regulatory Commission (FERC) published rules to establish open access to electric transmission lines as a major step toward electricity deregulation. A provision of those rules established open-access tariffs that would permit companies to recover part of the “stranded” costs represented by investments in their transmission lines and supporting equipment. At the same time, the rules were designed to assure that companies could not exercise an unfair competitive advantage by charging competing generators or resellers exorbitant rates for access to their lines.

Actuals – The actual commodities or physical cash commodities, as opposed to futures contracts or derivatives. Also called spot commodities or cash commodities. Utilities trade these commodities daily as a way to make sure the right amount of power gets to the right place at the right time.

Adequate Regulating Margin – The minimum on-line capacity of a system that can be adjusted instantly to handle changes in electricity use.

Affiliated Power Marketing Companies – Power marketers that are more than 5 to 10 percent owned by an electric utility or independent power producer. Many companies had such affiliates prior to the collapse of Enron. Since then, many companies, including Aquila, have shut down their affiliated power marketing companies.

Affiliate Transactions – Selling and trading between companies, one of which owns a controlling or influential share of the other(s) or all of which are being controlled by the same parent company.

Alternating Current (AC) – Electric current that reverses direction at regularly recurring intervals of time (such as 50 cycles per second), known as the frequency. AC can easily be converted to higher or lower voltages. (See also Direct Current.) In the United States the standard is 60 cycles.

Ampere (amp) – A unit of measure that tells how much electricity flows through a conductor. Amps = watts divided by volts. On a 120-volt system, a dozen 100-watt bulbs draw 10 amps of electric current.

Ancillary Services – Also known as Interconnected Operations Services, these are the services necessary for the transfer of electricity between purchasing and selling parties. The FERC requires a transmission provider to include these services (balancing, for example) as part of its open access transmission tariff. In other words, this makes the grid work nicely so your lights don't flicker all night long.

Available Margin – The difference between the demand for electricity and the electricity a utility has available. Expressed as a percent, it's the capacity available to cover demand in the face of random events, such as forced outages, demand forecast errors, weather extremes and slippage in capacity service schedules. Also known as Capacity Margin.

Available Transfer Capability (ATC) – A measure of physical transmission network available for further commercial activity.

Avoided Cost – Money a utility saves by purchasing power from another company instead of producing the power itself. Avoided costs include such things as reduced capacity requirements or fuel and lower line costs.

Barrel – A single-passenger vehicle used by a few enterprising individuals to navigate Niagara Falls. Also, a unit of measure for petroleum products, equal to 42 gallons.

Base Load – The minimum amount of electric power delivered or required over a given period, at a constant rate.

Base Load Plant – A power plant built for the specific purpose of providing power to a utility's customers. Engineers explain it this way because they want to be precise: A plant operated to take all or part of the minimum continuous load of a system and which produces electricity at an essentially constant rate. These plants are operated to maximize system mechanical and thermal efficiency and minimize operating costs. For accounting-types only: These plants typically have high fixed costs and low unit operating costs.

Best Efforts Service – A service level offered to customers that includes the possibility that service might be interrupted on short notice, particularly during peak load periods. Peak load occurs when a whole lot of people turn on their air conditioners at the same time.

Billing Demand – A charge a customer pays to reserve capacity or facilities used, regardless of the customer's actual consumption. Billing

4-4

demand may vary from actual demand during a given billing period since it can be based on a contract maximum, minimum or previous peak demand. It is also known as Ratchet or Ratcheted Demand Charge. That's a long-winded way of saying you pay for what you think you might need. Some companies buy their power this way because they want things to run just right.

Backstart Capability – The ability of a generating unit to start without assistance from an outside electric system. It's like jump-starting your car without hooking the jumper cables to another car.

Blanket Certificate (Authority) – A general authority, exercised under FERC rules, to purchase, transport or sell natural gas or electricity. A blanket certificate relieves the seller or buyer from obtaining prior approval for a sale or purchase.

Book Cost – The value at which property or assets are carried on a company's books, without adjusting for depreciation, amortization or other items. Book value is the book cost minus depreciation. Because book value is designed to allow a company to recover the cost of the item, it may vary significantly from the actual market value, which is used to calculate the cost of replacing the asset at today's prices. As far as Utility Lingo Simplified goes, your book cost is zero! We're giving it to you free of charge because we want you to understand our business as thoroughly as possible.

Broadband over Powerlines (BPL) – Technically it's the transmission of data along an electric company's existing wire network. It will also allow customers to use their home wiring to create a local network, thereby allowing various devices, such as personal computers, set-top boxes, consumer electronic devices, to communicate with one another. It will also make broadband available to small communities too remote for the service-for-pay telephone or cable companies.

Brownout – A reduction in the voltage of power supplied to customers. It results from insufficient supply of power to match demand. It's the first cousin to a blackout, which is what happens next if demand doesn't drop or more power isn't produced in time.

Bulk Power Transmission – The transport of a large amount of electricity at high voltages, usually from one utility to another, through high-voltage lines. These are usually rated at 100 kilovolts (kV) and above.

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Bundling – Billing for a group of services, such as generation, transmission and distribution of electricity, in a single fee. Aquila customers, as well as most utility customers across the U.S., receive a "bundled" bill. In the olden days, bundling had to do with keeping warm under a blanket while you were driving your hot date around in a horse and buggy.

Burner Tip – The end user, or the point of consumption for natural gas, such as your house (which has burners in the gas stove, furnace and water heater).

Bypass – Direct sales by producers, pipelines or marketers to end-users, thus eliminating services and costs associated with utilities or local distribution companies (LDCs). This kind of bypass is not covered by Medicare.

Capacity Charge – (See Demand Charge)

Capacity Margin – Excess electric generating capacity, beyond planned peak system demand. It is reserved for emergencies and generally specified by NERC standards.

Capacity Release – A party that owns firm gas transportation rights beyond its own needs may sell or release those rights to another party. The transfer of this capacity may be permanent or temporary.

Captive Customer – A customer, generally a residential or small business customer, who can purchase natural gas or electricity from only one supplier.

City Gate – The point where ownership of natural gas transfers from one party to another, neither of which is the end user. It also is the place where pipelines sell and deliver natural gas to the local distribution utility company.

City Gate Rate – The rate a supplier charges a local distribution company/utility. It is the cost of the natural gas where the distribution company takes ownership of it.

Cofiring – Burning natural gas along with another fuel to help reduce sulfur dioxide and nitrogen oxide emissions of the other fuel.

Cogeneration – Using heat (steam) that is produced by a natural gas-fired power plant to produce even more electricity or heating. In essence, cogeneration produces energy (electricity or heat) from two sources. While electric production may be somewhat less, more energy from the fuel reaches users (as steam or electricity)

than is the case with a boiler or turbine designed to produce only electricity.

Combined Cycle – A process in a power plant that produces steam from otherwise lost heat. This heat is routed to a conventional boiler or heat-recovery system generator for use by a steam turbine to produce additional electricity. Not to be confused with a bicycle built for two.

Combined Pumped-Storage Plant – A generating plant that uses a combination of stream-flow and pumped water to generate electricity.

Comparability of Service (Comparable Access) – Under FERC Order 636, all natural gas pipeline customers are assured equal access to transportation, storage, flexible delivery points and other services, regardless of whether they purchase natural gas from an interstate pipeline or an independent supplier.

Confirmed Nominations – Verification by the pipeline that a change in a customer's level of transportation service will be matched by a change in supplier quantities.

Conservation – Reducing the amount of energy consumed by a customer for a specific end-use. Behavior changes, such as thermostat setback, are included in this definition. This definition does not include changing the timing of energy use, switching to other fuel sources or increasing off-peak usage, even though these actions may make more efficient use of generation or distribution facilities.

Contingency Reserve – Operating reserve that allows a generating facility to reduce control area error to zero within 10 minutes after the loss of generating capacity. A control area is a utility's service territory, as in Southwest Missouri, for example. Error, in this case, means there's no more juice in the lines.

Continuous Rating – The amount of electricity that a system, facility, or element can support or withstand indefinitely without "burning up." For example, if you put too much electricity into your coffee pot, it will burn up, as in stop working. It also could catch on fire. (See also Emergency Rating.)

Contract Demand – The maximum amount of service that a party agrees to furnish over a given time (daily, monthly or annually) and for which a buyer agrees to pay a set charge. In other words, you get what you pay for.

Control Area – Generally, a utility's service area.

Core Market – A group of customers who have no choice but to buy electricity, or natural gas, or both, from a local supplier. Also called Regulated Market because prices are set by regulators, not by competition.

Cross-Subsidization – The practice of charging higher rates to one class of customer in order to lower the rates for another class. Also, transferring assets or services from a regulated business to the business of a company's unregulated affiliate. As used most commonly in the media, a cross-subsidy means the ratepayers are paying for a non-regulated activity, a no-no from a regulator's viewpoint.

Curtailability – In a curtailable interruptible electric service program, the customer agrees to pledge a minimum amount of electricity that can be curtailed (interrupted or withheld) by the utility during emergencies, generally in exchange for a lower rate, known as an interruptible rate. Natural gas deliveries may also be curtailed under similar arrangements, during periods of supply shortage or when demand for service exceeds pipeline capacity.

Decommissioning Sinking Fund – Money set aside to fund the permanent shutdown of a nuclear power plant.

Decontracting – Substantially reducing commitment by local distribution companies for firm space on pipelines when transportation contracts expire.

Deliverability – The volume of gas that a well, pipeline or distribution system can deliver during a given period, usually 24 hours.

Demand Charge (also called Capacity Charge) – A charge designed to recover costs associated with a given level of electric demand. It is paid even if no service is taken by the customer. The demand charge generally includes all costs associated with operating and maintaining a utility's generation, transmission and distribution systems.

Demand-Side Management – Any effort aimed at getting customers to use less electricity during peak demand periods, like during and after dinner. It includes conservation efforts like high-efficiency lighting, home insulation and lighting design, and incentives for replacing inefficient heating and cooling systems. Load control may include incentives to use less electricity as well as enabling the

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utility to turn a customer's heating and cooling units off or on by remote control.

Derating – Running a generator below the manufacturer's rating, which could damage or destroy the unit. For example, if the rating is 10 revolutions per minute and you run it at 5, it will (1) get hot and (2) stop running.

Deregulation – Since everyone has their own favorite way of explaining this one, let's go with what Webster has to say: To halt or reduce government regulations.

Design Day – A 24-hour period used as a basis for determining capacity requirements. It assumes a mean temperature, known as the Design Day Temperature.

Direct Current (DC) – Electric current that flows in one direction, remaining as close to constant "magnitude," or a certain flow, as possible (see also Alternating Current).

Disco – Short for distribution company; refers to a vertically disaggregated utility company (with distribution separated from generation and transmission), or one that has never owned power businesses other than retail distribution. (If you don't like that one, try this: An exercise facility focusing on the juncture of the sacrum and the ilium through the encouragement of sometimes rapid, highly torqued movements.)

Dispatching – Assigning generation and transmission of electricity through a system to assure coordinated operation. Also, sequencing the order in which generating resources are called upon to generate power to serve fluctuating loads at the most effective cost.

Distributed Generation – Any technology that provides electricity closer to an end-user's site, like a home or business. It may involve a small on-site generating plant or fuel cell technology. It's a hot topic today because improving technology is enabling manufacturers to make generators that are about the size of a refrigerator, or smaller. Like personal computers, these units are getting cheaper.

Distribution – The systems that ultimately bring energy to the end-user. Electric distribution refers to the system of power lines, transformers and switches. Natural gas distribution systems include the mains, service connections and equipment used to transport or control the supply of natural gas from the city gate to the customer.

(This is similar to the "last mile" referred to in the fiber optic and broadband communication business.)

EI – The Edison Electric Institute, a Washington, D.C.-based national trade organization of investor-owned electric companies that provides industry information and monitors regulatory changes and political developments.

EIA – The Energy Information Administration, an agency of the U.S. Department of Energy that collects and analyzes statistical information. It provides a wealth of information at www.eia.doe.gov. It also gathers required information from industry participants.

Electric System Losses – The total energy losses in an electric system between supply sources and delivery points. Loss occurs in transmission and distribution, primarily in the form of heat.

Embedded Costs – The cost of all the facilities in an electric or natural gas supply system. Also called sunken costs, because the money cannot be recovered by abandoning the project.

Emergency Rating – The rating, defined by the equipment owner, that specifies the level of electrical loading that a system, facility or element can support or withstand for a finite period. It assumes acceptable loss of equipment life or other physical or safety limitations for the equipment involved.

Emergency Voltage Limits – The operating voltage range on interconnected systems that is acceptable for a limited time while system adjustments are being made following a facility outage or system disturbance.

Enabling Agreement – The agreement that details the general terms and conditions for the purchase or sale of electricity, but that does not include the specific details or obligations of either the seller or the buyer.

End User – That's you: a homeowner, business, plant or other type of consumer of electricity or natural gas.

Equilibrium Price – The price that prevails in a particular market when supply and demand are equal. That's really different from market clearing price, which is the price at the end of the day when the market closes.

Equity Financing – Raising money by issuing shares of stock.

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Exempt Wholesale Generators (EWGs) – Independent power plants that generate electricity for sale on a wholesale basis vs. a more exempt generator that generates electricity for assigned or “regulated” customers. EWGs can be owned by utilities, utility holding companies, or developers not affiliated with an electric utility. The Federal Energy Regulatory Commission (FERC) determines EWG status and “exempts” the facility from restrictions imposed by the Public Utility Holding Company Act (PUHCA).

Exit Fee – The fee charged a customer to leave a utility system. It is intended to compensate the utility for its stranded, or fixed, costs related to supporting that customer.

Federal Energy Regulatory Commission (FERC) – The federal regulatory agency within the Department of Energy that oversees interstate electricity sales, electric rates, hydroelectric licensing, natural gas transmission, gas and oil pipeline rates, and investor-owned utility transmission.

Federal Power Act – Legislation, enacted in 1920 and amended in 1935, that governs the FERC.

Federal Power Commission (FPC) – The federal agency that preceded the FERC.

Firm Customer – A customer considered a high priority end-user, such as a residential customer, for whom contract demand is reserved and to whom the supplier is obligated to provide service. The customer receives Firm Service, service that anticipates no interruption, except for “force majeure” (causes beyond the control of the supplier, such as extreme acts of Nature).

Fixed Price – A price that is agreed upon by two parties and cannot change, regardless of subsequent fluctuations in market price.

Floor – A guaranteed minimum price that a seller will pay in a supply contract. Also, the space directly opposite the ceiling.

Flue Gas Desulfurization Unit (Scrubber) – Equipment used to remove sulfur oxides from a power plant’s combustion gases before they are discharged into the atmosphere.

Forced Outage – The unplanned shutdown of a generating unit, transmission line or other facility. Meaning, “the lights just went out.”

Forced Outage Reserves – The capacity needed to meet peak load during forced outages.

Forecast Uncertainty – The probable deviations from the expected values of factors considered in a forecast for energy demand or supply. Meaning, “I’m not sure.”

Fractionation – The process of separating liquid hydrocarbons removed from natural gas into propane, butane, ethane and the like. Fractionation can also refer to separating various petroleum liquids from crude oil.

Frequency – The rate at which alternating current oscillates, expressed in cycles per second, or Hertz (Hz). The standard for alternating current is 60 Hz in the United States, and 50 Hz in Europe.

FT – Firm transportation; capacity contracted for a natural gas or power transmission system that cannot be cancelled by the operator of the system. That means you bought it, so use it.

Fuel Cell – A device that generates direct current electricity from a chemical reaction. This rapidly developing technology promises radical advances in powering everything from automobiles to small buildings, and maybe even homes.

Functional Unbundling – Pricing each aspect of a service separately, such as the generation, transmission and distribution of electricity, or the production, transportation and storage of natural gas. Similar to what computer companies do; they sell you the computer and then you need to buy the software to make it do all the exciting stuff you see in advertisements.

Gas – One of the three forms of matter, the others being solid and liquid:

- Casinghead gas is unprocessed natural gas that is produced from a reservoir containing oil.
- Cushion gas is the natural gas required in a gas storage reservoir to maintain enough pressure to permit recovery of stored gas.
- Dry gas is natural gas that contains few or no hydrocarbons that can be recovered as a liquid product. Also, gas in which the water content has been reduced.
- Liquefied natural gas (LNG) is gas that has been super-cooled under pressure and remains a liquid at minus 116 degrees Fahrenheit and 673 psi. Not to be confused with liquid or liquefied petroleum gases (LPGs), which are hydrocarbons such as propane or butane that are gases at normal temperatures and

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pressures, but liquids under moderate pressure at normal temperature.

- Must-take gas is natural gas that is committed to a purchaser who is obligated to take it. As in, "It's yours, even if you don't need it."
- Non-associated gas is gas that is not in contact with or dissolved in crude oil in a reservoir. Unofficially, that means it's all alone.
- Shut-in gas is intentionally not being produced because of state conservation orders, unfavorable economics, or the failure of committed buyers to take it.
- Sour gas is natural gas that contains sulfur compounds that must be removed because of their corrosive effect on piping and equipment.
- Sweet gas is the opposite of sour gas; it does not need to be purified before it can be transported or used.
- Synthetic natural gas (SNG) is methane derived from sources other than naturally occurring reservoirs. It might be extracted by heating coal, refining heavier hydrocarbons, or processing organic materials such as garbage.

Gas Inventory Charge (GIC) – A charge paid by a buyer to the supplier for holding natural gas supplies that'll be delivered later.

Gathering System – The pipelines and other equipment used to collect, process and deliver natural gas from the producing field to the trunk or main transmission lines of a pipeline system.

Genco – Short for generating company; the generating portion of a disaggregated utility's operations. Said another way, it's a company that owns just generators, and no transmission or distribution systems.

Greenhouse Effect – The warming of the atmosphere caused by the buildup of "greenhouse" gases, which allow sunlight to heat the earth while absorbing the infrared radiation returning to space, preventing the heat from escaping. Gases contributing to the greenhouse effect include carbon dioxide, methane, chlorofluorocarbons, ozone and water vapor (which you see as steam).

Green Power – Electricity produced using wind, sun, or steam escaping from the earth. By definition, federal regulation also includes power generated by such sources as gas produced by decaying garbage. In Kansas and Missouri, Aquila customers can purchase power produced by windmills. Also includes energy produced by biomass, hydro and geothermal.

Grid – The network of high-voltage transmission lines through which power moves. In the United States, there are three distinct electric power grids: the Eastern Interconnection, the Texas (or ERCOT) Interconnection and the Western Interconnection. The grid has big, fat power lines that have a tendency to hum.

Gross Available Capacity (GAC) – The capacity at which a unit can operate with a reduction imposed by a derating (see definition). Translation: the power you have available to sell.

Gross Dependable Capacity (GDC) – The gross maximum capacity (GMC), modified for seasonal limitation over a specific period.

Gross Maximum Capacity (GMC) – The maximum capacity of a unit sustainable over a period of time, unmodified by seasonal or other deratings.

Header – A natural gas facility where several pipeline systems interconnect. In soccer, refers to kicking the ball with your noggin instead of your foot.

Heat (or Heating) Rate – The measure of efficiency of converting fuel to electricity, expressed as Btu's of fuel per kilowatt-hour. The lower the heat rate, the more efficient the plant.

Hourly Peak – The peak demand for energy from a transmission or distribution system during a one-hour period.

HVAC – Heating, ventilation and air conditioning. Or tech-talk for keeping you warm and cool.

Imbalance (electric) – The condition that occurs when generation and interchange schedules do not match demand. An imbalance could lead to a "brownout." A prolonged imbalance could lead to a "blackout."

Imbalance (gas) – The condition that occurs when there is a discrepancy between a transporter's receipts and its deliveries of natural gas for a shipper.

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Imbalance Penalties – Penalties imposed by a pipeline when a shipper fails to maintain a specified percentage balance between receipts and deliveries. This applies to the natural gas business only.

Independent Power Marketer – A company, other than a utility, that sells wholesale electricity. That is, they sell to just about anyone except homeowners. With the advent of electricity deregulation, independent power marketers proliferated and were becoming an important market force. Now their futures are in question, in part because after the fall of Enron and the highly publicized energy problems in California, many people wonder if there is a future for deregulation in the energy business.

Independent Power Producer (IPP) – A producer of electricity not affiliated with the local utility company selling the power. Also see Exempt Wholesale Generator (EWG).

Independent Producer – In the natural gas industry, a company engaged in just the production or gathering of natural gas.

Independent System Operator (ISO) – An entity that controls and administers access to electric transmission in a region or state or across several systems, on a non-discriminatory basis (that means one guy doesn't get a better deal than the others) for a number of independent utilities. Under FERC Order 2000 an ISO, after complying, can become an RTO (Regional Transmission Organization).

Input/Output Test – A test of generating units used to determine their efficiency (heat rate) at various loads and operating outputs.

Instantaneous Demand – The rate of energy used right now.

Instantaneous Service – The ability to change delivery of natural gas on a pipeline on the same day you ask for it.

Interchange (or Transfer) – The net exchange of power across or between control areas. In some ways it resembles an interchange where several highways criss-cross each other.

Interchange Energy Agreement – An arrangement that assures all parties an equal ability to serve their firm loads. (Remember, a firm load is what you really need to meet customer demand.) Parties unable to meet their loads in a given month may request interchange energy from someone else who has extra. (They buy it at a previously set price, so there is no rip-off here.)

Interconnected System – Two or more power systems with connecting tie lines that are normally synchronized (like on the same beat, man) in their operation, so that in many ways they operate as a single entity.

Interconnection – When capitalized, the word refers to one of four synchronized bulk electric system networks in the North American Electric Reliability Council: the Eastern, Western, ERCOT and Quebec. When it is lowercase, it refers to facilities that connect two or more systems or control areas.

Intermediate Load – The range between baseload (see definition) and peak load.

Interruptible Demand – It's a way to get natural gas or power at less than a premium rate. The deal is, when there's a short supply of either, like on those long, hot summer days when everyone's air conditioner is set on super-cool, you're going to have to shut something off because you're about to get less power, or no power at all. Customers signing up for interruptible demand pricing deals are generally industrial or commercial firms. In an energy shortage, their workers might be sent home early because the plant is being shut down.

Interruptible Service – Gas service that can be interrupted at the option of the pipeline operator. Also referred to as "best efforts" service, the tariff for interruptible service is lower than for firm service.

Inverted Block Rate (Graduated Rate) – A rate structure by which successive blocks of power are priced at increasingly higher rates.

IOU – A worthless piece of paper on which one writes a promise to pay a party generally referred to as a sucker. Short-form for an "investor-owned utility," i.e., a utility that has stockholders.

Joint Use (or Common Use) Facility – A facility jointly used by two or more power generating units.

Just and Reasonable Rate – A rate set at the lowest reasonable level that recovers a pipeline's costs, according to the Natural Gas Act of 1938 and the Natural Gas Policy Act of 1978 (see table on page 10). It generally means a rate based on the properly allocated cost of providing service. State regulators use this in rate setting.

Lambda – The measure of the rate at which fuel is consumed relative to electric output, expressed in Btu's per kWh. It is often referred to as the incremental cost of power. Also, the eleventh letter of the Greek alphabet.

LDC – A local distribution company, which is a utility that obtains the major part of its income from a retail distribution system for the delivery of natural gas or electricity to end-users. Said plainly, it's the company that supplies your home with electricity or natural gas in exchange for your hard-earned cash.

Lifeline Rates – A rate for a block of electricity sufficient for basic use of residential customers. Usage beyond that block is priced at a higher rate.

Load Curve – A graphic representation showing power supplied, plotted against time, to illustrate the varying magnitude of the electric load during the period covered. Power company employees check the graphs to make sure everything is okay.

Load Duration Curve – Used to show the period of time that electric load was above a certain magnitude. These curves profile system demand and can be drawn on a daily, monthly or yearly basis.

Load Factor – In electric systems, the ratio of average output to peak output during a specific period of time, expressed as a percent. In gas, the ratio of the amount of gas a customer takes, compared to the maximum amount the customer is entitled to take. The load factor capability is a measure of the degree to which physical facilities are being utilized. It's one indicator of efficiency.

Load Following – An electric system's ability to regulate generation in response to instantaneous changes in demand. It's something like closely following the car in front of you without hitting it.

Load Management – Shifting of electric load patterns to use a system's facilities more efficiently. Load management generally tries to shift usage from peak times to off-peak periods of a day or year. This is different from conservation measures, which attempt to reduce total usage for a given period of time.

Load Shape – The pattern of the magnitude of power load over a given period of time. Imagine it as a line that goes up and down as it crosses a sheet of paper.

Load Shedding – Deliberately removing pre-selected demand from a power system to keep the system working and minimize outages during periods of abnormal conditions. Also, the highway phenomenon that results in all those stray mattresses and sofa cushions along the side of the road.

Load Shifting – See Load Management.

Loss of Load Probability – A measure of the expectation that system demand will exceed system capacity during a given period; usually expressed as a number of days per year or longer period.

Loss Supply – Supplemental power provided by another utility, called a wheeling utility, to compensate for losses incurred during transmission.

Main – A distribution line for natural gas or electricity that serves as a common source of supply for more than one service line.

Marginal Cost – Incremental or differential cost. For electric utilities, it is the cost of providing the next, or marginal, kilowatt-hour of electricity, irrespective of fixed costs.

Marketer – A company that specializes in bringing together sellers and buyers of energy, usually on a spot-market basis. A marketer negotiates price and arranges transportation and delivery.

Marketing Affiliate – A gas or electricity marketing company owned or substantially controlled by a gas pipeline or distributor or by an electric utility.

Minimum Generation – The lowest level to run a generator so you can meet peak power needs.

Monopsony – The opposite of monopoly. A monopsony is a market in which there is only one buyer for multiple sellers. Gas pipelines typically had a monopsony relationship with producers and a monopoly relationship with downstream customers. The creation of a national grid system with open access policies results in competitive relationships that are sensitive to price.

Muni-Lite – A municipal utility that does not own generation or significant transmission or distribution facilities. It owns only home and business meters and purchases power from a wholesale market for resale to homeowners and businesses.

Must-Run Units – A generating unit that must be online or on the grid to ensure the stability of the system, even if it costs more to run than other units that may be available on the system or in the power pool.

Native Load – The total requirements of a utility's retail market.

Net Actual Generation – The actual electrical energy a unit generates during a given period, less any generation used by the unit itself or it by its auxiliaries. Also known as the net generating station capability. The amount is not a constant; it can vary depending on the season and other factors.

Net-Back Pricing – A method of pricing natural gas at the wellhead, based on what it sells for at the burner tip (i.e., where you use the gas, such as your stove or furnace).

Net Capacity – The maximum capacity a power plant can sustain over a period of time, less the capacity used to supply its own needs for things such as motors and other equipment essential to its operation. This capacity may be modified to account for seasonal or ambient limitations. If you're a boat captain, refers to how many tuna you can haul in at any given moment.

Net Generating Station Capability – The total capacity of a generating facility to produce power, less the amount it needs for its own uses.

No-Bump Rule – A rule that protects a natural gas shipper from losing pipeline capacity because of an increase in volumes by another shipper with a higher priority in the interruptible queue.

Nominal Voltage Rating – Voltage standards set by U.S. electrical equipment manufacturers and electric utilities to ensure that equipment is designed for the voltage range encountered in actual use.

Nomination – A request for service under a service agreement. Also, a natural gas shipper's offer to move gas on a pipeline during a given period. Nominations may be made on a daily, mid-day or hourly basis. Even after reading this it's quite understandable why the word makes more sense in the political arena.

Non-Coincident Demand (NCD) – A customer's maximum electric demand during a given period. Sometimes called a customer's monthly Non-Coincident Peak Load.

Non-Depletable Energy Sources – Energy obtained from sources such as the sun or falling water that are not depleted by use.

Non-Firm Energy – Electricity that is not required to be delivered or taken under the terms of an electric purchase contract. In other words, it's extra.

No-Notice Service – A service under which a customer may receive additional natural gas on demand, regardless of prior nominations, without paying penalties. "Oh, you want it? You can have it."

Non-Spinning Reserve – Generating units that are not connected to a system, but that may be placed online when needed.

Non-Utility Generator (NUG) – A generator not owned by a utility. A NUG may be a qualifying facility, an independent power producer or an exempt wholesale generator. (See those definitions.)

North American Electric Reliability Council (NERC) – A power industry alliance formed in 1968 as a result of the massive 1967 New York City blackout. Its purpose is to make sure that kind of event doesn't recur. NERC is composed of 10 regional councils and includes virtually all the power regions of the contiguous United States, Canada, and part of the Mexican state of Baja.

NRC (The Nuclear Regulatory Commission) – A federal agency that licenses and regulates U.S. nuclear power plants.

OASIS (Open Access Same-Time Information System) – The FERC-sanctioned electronic information system for electronic transmission capacity availability. OASIS replaces the Real-Time Information Networks System (RINS). Each public utility that owns, controls or operates facilities used for the transmission of electric energy in interstate commerce must participate in an OASIS. It provides existing or potential open access transmission customers with information about available transmission capacity, prices, and other information essential for obtaining non-discriminatory open access transmission service. Think of it this way: If you own a transmission line, this is how you tell your customers when you have available transmission capacity to sell. It's the power company's version of Ebay.

Off-Peak – A period of lower energy demand.

Ohm – A unit of electrical resistance. One volt can produce a current of one ampere through a resistance of one ohm. (Sing it well enough and you might qualify to become a Tibetan monk.)

Open Access – Access on a non-discriminatory basis to the transportation or transmission services of a pipeline or electric utility. That means you can use it.

Operable Nuclear Unit – A nuclear generating unit certified for full-power operation by the NRC, following successful completion of its low-power tests.

Passive Solar Energy – Using the sun to help meet energy needs through architectural design, such as the orientation of a building, arrangement of windows and choice of materials to conserve heat in winter and dissipate it in summer.

Peak Demand – The maximum electric load, including losses experienced by a system, in a given period. It is the actual demand by all system customers plus losses.

Peak Load Plant, or Peaker Unit – A power plant used during maximum load periods. A peaker generally has quick start up time per megawatt energy costs, but often has low capital costs. Generally, it's used only during peak demand periods like a long hot summer.

Peak Shaving – Reduction of peak demand for natural gas or electricity.

Peaking Supply – A supply of natural gas available to meet peak demand.

Peaking Supply Service – A service that allows a customer to obtain a given quantity of natural gas at the buyer's request during peak periods.

Performance-Based Rates (or Regulation) – An alternative to cost-of-service rates (or regulation). In this method, rates are adjusted to reflect a utility's practice of exceeding targets for efficiency, cost-savings or customer satisfaction. Essentially, the utility and its customers share the rewards of excellent performance. For example, if the utility meets improved efficiency targets, the customers can enjoy lower rates and the utility is allowed to keep some of the savings.

Photovoltaic Conversion – Direct conversion of the sun's energy into electricity using photovoltaic cells.

Planned Derating – The planned reduction in a power plant's capacity to allow repairs or maintenance on system components.

Plant-Use Electricity, or Plant Auxiliary Load – The electric energy used to operate an electric generating facility.

Point of Delivery (POD) – The point where a power supplier delivers electricity. It could include an interconnection with another system or a substation.

Postage-Stamp Rate – A flat-rate charge for transportation of natural gas or transmission of power without regard to distance. Same way it costs 37 cents to send a letter, whether it's going to the next town or all the way across the country.

Power Broker – An individual or firm that arranges bulk power transactions. Power brokers bring together a seller and buyer, without taking title to the power. Power brokers, unlike power marketers, assume no risk. Utilities will sometimes go to a power broker to find the lowest priced power available, especially in the summer-time when high temperatures and high cooling use increase the need for power.

Power Exchange (PX) – A place where power from various systems is scheduled. Also, on an Army post it is where you buy all your tax-free goods. Military personnel call it the "PX" short for Post Exchange.

Power Factor – That part of the power actually used by a customer's electrical equipment, expressed as a percentage of the total power supplied. Power factors only apply to AC circuits.

Power Marketing Administrations – One of five administrations established by Congress to sell hydroelectric power generated by federal dams and power plants. The TVA is a separate agency with similar functions.

Power Swipes – When one utility takes power off the grid without telling anyone it did it.

Preferred Day-Ahead Schedule – A scheduling coordinator's preferred schedule for day-ahead scheduling process. The schedule may also be done on an hour-ahead basis.

Preferred Schedule – The schedule produced by a scheduling coordinator, representing the preferred mix of generation to meet demand. Included in the schedule are the quantity of output (gen-

erators) and consumption (loads), details about any adjustment bids, and the location of each generator and load. The schedule details the quantities and location of trades among scheduling coordinators and is balanced with respect to generation, transmission losses, load and trades.

Provider of Last Resort – An entity, traditionally a utility, obligated by law to provide service to a customer whose business is not wanted by competing utilities.

Pumped-Storage Hydroelectric Plant – A plant that generates electricity during periods of high power demand by releasing water that had been pumped into a reservoir during periods of low demand. It is an efficient means of using low-demand energy to meet high demand needs, since pumped storage returns about two-thirds to three-fourths of the electricity put into it. Plants that use both pumped water and natural stream flow are called Combined Pumped-Storage Hydroelectric Plants.

Ratchet or Ratcheted Demand Charge – See Billing Demand.

Rate Base – The value of property on which a utility is allowed to earn a specified rate of return. There are many ways to calculate the rate base, including fair value, prudent investment, reproduction cost and original cost. It may also cover items such as working capital and prepayments, and can be adjusted for items such as depreciation, deferred taxes and accumulated deferred investment tax credits.

Rate Structure – The schedule of charges that an energy company or utility uses to bill customers for energy, including:

- Block Rate – A rate that prices various blocks of demand or consumption using different unit charges.
- Flat – A rate that does not vary with the quantity used or the contract demand.
- Lifeline – A residential rate for a specified block of energy that is priced below the allocated cost of service.
- Mileage-Based – A rate determined by the length of the haul.
- One-Part – A per-unit or commodity charge without components for reservation, demand, etc.
- Postage-Stamp – Transportation rate applicable to a given zone or area, as opposed to a mileage-based rate.

- Seasonal – A rate that changes with the season.
- Step – A tiered price structure that depends on the step within which the last consumed unit falls.
- Straightline – A constant per-unit charge that does not vary with an increase or decrease in the units used.
- Three-Part – A rate consisting of a customer charge, a demand charge and a commodity charge.
- Two-Part – A rate consisting of a demand charge and a commodity charge.
- Volumetric – A rate or charge based on the amount or volume actually received by the customer.
- Zone – A rate based on a zone through which the energy moves.

Real-Time Pricing – Pricing of electricity that reflects the actual time of day when the power is used. Customers with real-time pricing receive frequent signals throughout the day on the price of electricity at that moment.

Regional Transmission Organization (RTO) – FERC-mandated regional organizations charged with managing the transmission of power in a region of the country.

Release – A party's ownership of firm gas transportation rights beyond its own.

Reliability – For an electric system, reliability means the ability to supply the electrical demand and energy requirements of its customers at all times, taking into account scheduled and unscheduled outages as well as the ability of the system to withstand sudden disturbances, such as electrical shorts or unanticipated loss of facilities.

Reliability Must-Run Generation – Generation that an independent service operator (ISO) determines is necessary to meet the system's reliability, satisfy demand in constrained areas, or provide voltage or security support for the ISO or a local area.

Reliability Must-Run Unit – A unit that an ISO can, with compensation, demand that an owner run when required for grid reliability.

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Reserve – The generating capability that an electric utility needs, in addition to the highest level of user demand, to meet its needs.

Reserve Generating Capacity – The capacity of units kept available by an electric utility to meet special needs. This may occur when demand is unusually high, or when other units are offline for maintenance, repair or refueling.

Reserve Margin – The margin between a system's dependable capacity — including firm power purchases, but excluding maintenance or forced outages — and anticipated peak load. It is expressed as a percentage of peak demand.

Rolled-In Pricing – A pricing method in which rates are based on the weighted average of all costs for all customers or services, rather than on allocating specific costs to specific customers.

Rollover Clause – A clause in a natural gas contract that allows the contract to extend beyond its initial term.

Royalty – Money paid to the owners of mineral rights, typically based on a percentage of total production. Such owners may or may not bear a share of the expenses of production, according to the lease terms. Also how many high-paid actors and athletes think of themselves.

Run-of-River Plant – A hydroelectric plant that relies on the flow of a stream or river, with no capacity to store water.

Scrubber – See Flue Gas Desulfurization Unit. Also, those gritty kitchen pads sold in the supermarket.

Security Coordinator – The regional entity charged with ensuring the reliability of a power system by monitoring the operation of regional grids and coordinating the actions of control area operators during emergencies. A security coordinator is barred from participating in wholesale or retail merchant functions.

Scheduling Coordinator – Submits balanced schedules and provides settlement-ready meter data to the independent system operator. The scheduling coordinator also settles with generators and retailers, the PX and the ISO; maintains a year-round, 24-hour scheduling center; provides non-emergency operating instructions to generators and retailers, and transfer schedules in and out of the power exchange, or PX. The PX itself is considered a scheduling coordinator.

Service Voltage – The voltage at which a customer is connected to the electric system.

Shaping – The management of generating resources to meet variable demand. In a hydroelectric system, for instance, shaping may involve varying the release of water from a reservoir in order to maintain a balance between generation and demand.

Short-Run Avoided Cost (SRAC) – Costs that a utility avoids by taking power from a qualifying facility for a relatively short period, such as one month. A qualifying facility, as defined by the Public Utilities Regulatory Policy Act of 1978 (PURPA), is a small power producer or a cogenerator that sells its electricity to public utilities.

Small Power Producer (SPP) – Defined by PURPA as an entity that generates electricity using renewable resources, such as waste, wind, solar or geothermal energy for at least 75 percent of its total energy input. Its design capacity must be 80 megawatts or less.

Sour Gas – Natural gas that contains lethal hydrogen sulfide; it must be purified before it can be introduced into the interstate pipeline system. It smells sort of sour, thus the name.

Spill – The overflow structure of a dam; the release of water from a reservoir that does not pass through turbines to generate electricity.

Spinning Reserve – Unused but available capacity from generating units that are connected to and synchronized with a grid. It is nearly “instantly available” to meet additional demand.

Standby Demand – The amount of power available as a secondary source or backup for the outage of a customer's primary source, as specified by contractual arrangement. At the airport, this refers to the length of that line of especially anxious passengers who keep bugging the ticket agent every few minutes.

Substation – A facility that switches, steps down or regulates electricity. Substations also serve as control or transfer points in an electrical system. Their purpose is to route and control electricity, alter voltage levels and serve as delivery points.

Sweet Gas – Natural gas that does not need to be purified to remove sulfur-bearing compounds. In other words, the opposite of sour gas. This particular sweet and sour stuff has nothing to do with a Chinese restaurant.

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Swing Supply – A supply of natural gas that is the last to be taken by a customer and the first to be curtailed if a shortage arises.

Take-or-Pay – A contract clause that requires a buyer to pay for a quantity of natural gas or electricity whether or not that amount is actually used. Typically in the past, take-or-pay clauses stipulated an absolute amount (usually of gas) or a percentage of the total contract amount that had to be taken over a period of time, usually a year. Take-or-pay clauses are rare today.

Tiered Rates – A system of rate schedules that divides customer usage into different tiers or blocks, each with a different price.

Time-of-Day Rates – Rates that vary with the time of day — higher during periods of peak use and lower during periods of low demand. Also known as Time-of-Use Rates, they differ from real-time pricing in that they are based on forecast, rather than actual, costs. While rates for real-time pricing fluctuate many times a day, time-of-day rates vary on a fixed schedule, usually in blocks of three to four hours.

Tolerable Zone – A band of voltages that is above and below the Preferred Zone. While not ideal, voltages in the tolerable zone permit customers' equipment to operate satisfactorily and without undue wear or damage, although performance may be compromised.

Transco – Short for transmission or transportation company. The bulk transmission part of a disaggregated electric utility, operated as a separate entity. Transmission lines are those fat wires you see cutting across golf courses and mountains. In the case of gas, it's the pipeline.

Transformer – A device that changes the voltage of alternating current.

Transition Costs – Costs associated with deregulating a formerly regulated industry. These costs include stranded costs. They occur when customers are permitted to switch providers before the original provider has recovered certain costs, including mandated purchased power arrangements, capital, taxes, and costs associated with social policy and environmental matters.

Transmission Grid – An interconnected system for transmitting power along high-voltage lines in bulk from points of supply to points of demand.

Unbundled Services – Energy services that are sold and priced separately, such as generation, transmission and distribution.

Vanilla – A plain transaction. For example, you own natural gas and you sell it. Also, one of America's favorite ice cream flavors.

Vertical Integration – A corporate structure in which one company owns all the different aspects of making, selling and delivering a product or service. A vertically integrated electric utility would own generation, transmission and distribution facilities.

Volatility – Changes in the commodity price. The more price changes, the greater the volatility and the greater the opportunity to make a profit through trading.

Volt – A unit of electromotive force. One volt, applied to a circuit with a resistance of one ohm, produces a current of one ampere. In the United States, electrical systems of most homes and offices are 110 volts.

Wellhead Price – The price paid to the producer for natural gas at the well.

Wet Gas – Natural gas that contains liquefiable hydrocarbons; also, natural gas that has more than seven pounds of water per million cubic feet.

Gas And Electric Measures

The Lingo Of Gas Measures

Bcf – One billion cubic feet, a common measure of natural gas (see Cubic Foot).

British Thermal Unit (Btu) – The quantity of heat required to raise the temperature of one pound of water one degree Fahrenheit at a specified temperature. When it comes to natural gas, Btu's are divided into "dry" and "saturated." Natural gas that is moisture-free, or that contains less than seven pounds of water vapor per Mcf, is measured in dry Btu's; when natural gas is fully saturated with water vapor, under standard temperature, pressure and gravity conditions, it is measured in saturated Btu's.

Cubic Foot – The standard size of a New York apartment closet. Well, okay, it's a measure of natural gas volume, referring to the amount of gas needed to fill one cubic foot at standard atmospheric pressure and 60 degrees Fahrenheit. A cubic foot of gas contains approximately 1,000 Btu's, which is enough gas to boil a heckuva big pot of water.

Gigajoule – A unit of energy that equals 943,213.3 Btu's. That's enough gas to heat up a bigger bunch of water, like maybe a swimming pool.

Mcf – One thousand cubic feet, generally of natural gas (see Cubic Foot).

MMBtu – One million British thermal units (Btu's), also known as one dekatherm. It is equal to approximately 1,000 cubic feet of natural gas — enough energy to bring 800 gallons of water to a boil, or heat up 12,800 cups of coffee. In teaspoons...oh, never mind!

Mmcf – One million cubic feet, usually of natural gas.

Quad – One quadrillion British thermal units (Btu's), or the energy equivalent of 170 million barrels of oil. In a typical year, the United States uses an average of 83 quads.

Therm – A unit of heating value equal to 100,000 Btu's.

The Lingo Of Electric Measures

Gigajoule – A unit of energy that equals 943,213.3 Btu's.

Gigawatt (GW) – One billion watts.

Gigawatt-hour (GWh) – One billion watt-hours.

Joule – A measure of energy equal to one watt-second, or one watt of power supplied to, or taken from, an electrical circuit steadily for one second.

Kilovolt (kV) – Electrical potential equal to 1,000 volts. Most car batteries are 12-volt, so 1 kV is the juice that could be produced by 83.3 car batteries.

Kilowatt (kW) – A unit of electric power equal to 1,000 watts. One kilowatt can light up ten 100-watt light bulbs.

Kilowatt-hour (kWh) – The basic unit for pricing electricity. A kilowatt-hour is equivalent to one kilowatt of power used for one hour. That's enough juice to run an average home for a day, give or take shutting off an air conditioner or two. It equals 1,000 watt-hours and is the equivalent of 3,412 Btu's of energy.

Megawatt (MW) – One thousand kilowatts. One megawatt-hour is enough power to service 1,000 homes for about one day.

Watt – The basic unit for measuring volume of electricity. Technically, it's the power produced by a current of one ampere across a potential difference of one volt. For those who care, there are at least 135,000 ways to scientifically or mathematically define potential difference.

- Gigawatt (GW) – One billion watts.
- Gigawatt-hour (GWh) – One billion watt-hours.
- Kilowatt (kW) – A unit of electrical power equal to 1,000 watts.
- Kilowatt-hour (kWh) – The basic unit for pricing electricity, a kilowatt-hour is equivalent to one kilowatt of power used for one hour.
- Megawatt (MW) – A megawatt equals 1,000 kilowatts.
- Terawatt-hours (TWh) – Equal to 1,000 gigawatt-hours, the terawatt is a commonly used energy yardstick in Europe.
- Watt-hour (Wh) – One watt of power supplied to or taken from a circuit for one hour.

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How Are Utility Rates Set?

It happens to everyone, every month. You get your natural gas or electric bill, or both, and the back of your mind wonders: Why does it cost this much for something I don't see, feel, touch or eat? There are a lot of answers to that question, many of them dealing with the economics of energy. Books have been written about that subject, so let's move onto something that may be a little bit more concrete—the process used to set or establish the rates you pay for your gas and electricity.

In keeping with the simple approach employed in this booklet, let's just say it's basically a three-step process:

1. The utility applies to its state utility commission for approval to charge its customers a new rate, usually affected by the rising or falling costs of buying fuel (like natural gas to run a power plant), the cost of borrowing money to operate the business, recovering the costs to build new plants and other funding items like the rising cost of employee pension benefits.
2. The state commission and its staff, as well as consumer protection and industry groups, spend many months reviewing the request, as well as the company's operating data that is used to support the requested rate increase. Then other various parties voice their opinion to the members of the commission.
3. The commission makes its decision and the utility applies the new rate to its customers' bills.

Sounds simple enough. But, and there's always a but, the rate-making process also is a very detailed process that constantly and necessarily seeks public input. For example, any data used to support the utility's request is examined by the commission, its staff, the state's consumer protection office, as well as other interested consumer protection and industry groups. Also, the commission holds several public hearings throughout the state to find out how the public feels about the requested rate change, as well as the level of service provided by the utility.

At the same time, newspapers and other media publish stories about the request, and often offer their views.

Whether the utility distributes natural gas or electricity, it operates as a regulated monopoly. In essence, each company is authorized to provide service in a specific geographic area, under an exclusive franchise. In return for this monopoly, the utility is regulated by a state authority responsible for ensuring that the public receives what it is paying for.

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The whole idea behind the rate-making process is to make sure that the utility is providing adequate service to its customers, and doing it as efficiently as possible.

As you might guess, there's a special language that goes along with this rate-making process. Here's a simplified look at those terms and what they mean:

Adjustments – Changes made in calculating a utility's test year costs to reflect constant expenses for the future.

Allocation of Costs of Service – Determination of how much each type of a utility's customers will pay for their service.

Annualized Costs – An adjusted amount to reflect increases in such costs during the test year for a full 12-month period.

Appeal – Request by any party in a rate case for reconsideration by the courts of a commission decision.

Briefs – Written arguments submitted to a commission by the parties in a rate case.

Commission – State authority, charged with regulating public utilities; may be called a Public Service Commission, Public Utilities Commission or Corporation Commission.

Cost of Service – Total dollars required to provide utility service (revenue requirements), including a fair return on investment.

Examiner – Commission examiner or a designated senior staff person, assigned by a commission, to conduct the rate case hearings; takes and studies evidence and makes a recommendation on findings to the commission.

Exceptions – Statement of disagreement with an examiner's recommendations to a commission, filed by any party in a rate case.

Fair Value – Current value of a facility, computed by taking the original cost and adding the cost of inflation from the time of construction to the present.

Fuel Cost Adjustment – Rate change which reflects an increase or decrease in the price of fuel used or sold by the utility, granted by a commission in a separate action apart from a general rate case.

Hearing – Public meeting at which a utility, intervenors and the commission staff present their arguments on a pending rate case.

Interim Rate Increase – Portion of a requested rate increase, authorized by a commission to be implemented before the final outcome of the rate case is determined. The reason for this adjustment is because the utility would experience a severe financial emergency without immediate rate relief.

Interrogatories – Requests from a commission staff or intervenors to a utility for supplemental information or clarification on a rate case petition.

Intervenors – Consumer and other interested groups who participate, with a commission's permission, in rate case hearings by presenting viewpoints and data and questioning witnesses.

Lifeline Rates – Rate design in which disproportionately low rates are granted to low-income, low-use customers in consideration of their limited finances.

Non-Recurring Cost – A one-time-only expense incurred by a utility, such as the cost of repairing storm damage to its facilities.

Normalization – Elimination of non-recurring expenses from test year costs.

Operating Costs – Expenses incurred by a utility in providing its products and services, including employee wages and benefits, maintenance, advertising and promotion, customer service, materials and supplies, fuel, administration, taxes, and depreciation.

Original Cost – Amount paid to construct a facility when it was built by the utility.

Prehearing Conference – Meeting of representatives from a commission, a utility and intervenors to set a schedule for rate case hearings, to limit issues to be considered in the case, and to establish facts on which all the parties agree.

Purchased Gas Adjustment Clause – Provision which permits a utility to pass on to consumers any increase or decrease in costs for the natural gas supply it purchases.

Rate Base (Investment Base) – Amount of money a utility has invested over the years in facilities that serve the customers, plus the amount of working capital required to keep the company going, less depreciation collected over the years.

Rate Case – Proceeding before a regulatory commission through which a utility seeks a change in the rates it charges its customers.

Rate Design – Allocation of a utility's cost of service to the various types of customers it serves.

Rate of Return – Percentage of a utility's investment allowed as profit and paid to stockholders in dividends or kept in the business as retained earnings.

Rate Order – Commission's decision in a rate case, stating the commission's findings on the utility's petition and an explanation of the basis for the order.

Regulated Monopoly – Company authorized to provide service in a specific geographic area under an exclusive franchise, meaning it has no competition.

Regulatory Lag – Amount of time that elapses between the filing of a rate case petition and issuance of the final rate order. It can also be the amount of time that elapses from the time an expenditure is made and lasts until that expenditure is recovered in rates.

Rehearing – Reconsideration of a rate order by a commission, requested by any dissatisfied party in a rate case.

Staff Report – Report of a commission staff on a rate case petition following the staff's investigation of the case.

Subject to Refund – Condition placed on rate increases that are put into effect prior to a final commission order. If the commission later decides on a lower amount, the utility gives back the money it receives under the preliminary rate increase.

Suspension – Delay in putting a rate increase into effect until the commission can study and rule on it.

Test Year – A recent 12-month period, often the previous calendar year, used as a basis in estimating future utility costs in a rate case.

Transcript – Written record of rate case proceedings, including the utility's case and documentation, cross-examination, the staff report and witnesses, and the intervenors' presentations and cross-examination.

Types of Customers – Residential, commercial and industrial groups purchase a utility's product or service.

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