

April 2009

Associated Electric Cooperative Briefing Book

For cooperative managers and staff

To help answer common questions related to wholesale power supply

Introduction

In view of Associated's wholesale rate increase effective April 1, 2009, to meet rising fuel, environmental, maintenance and capital costs, we have prepared this book to brief you and assist you to address questions from co-op directors, members, the general public and media about rate increases.

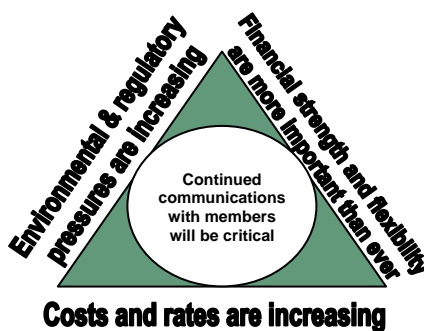
With regard to inquiries from media, feel free to refer media to Associated's staff for questions related to the reasons wholesale power costs are increasing. However, because each system's rate situation is different, Associated's staff will address its responses to costs of wholesale power supply and not rates. Associated staff will refer specific rate questions to the respective G&T and/or distribution cooperative.

In addition to Associated's recent rate increases, there have been a number of recent developments that have the potential to increase rates further. For example, EPA recently announced its position that carbon dioxide is a danger to public health. In addition, President Obama's recent budget submission to Congress includes a proposal for a carbon dioxide cap-and-trade program to be implemented in 2012 to address CO₂ emissions. It is proposed to include an allowance bidding process, and allowances are projected to cost \$20 per ton of CO₂ emissions in the process.

The rate increases assumed in Associated Electric Cooperative's most recently approved long-range financial plan will change in light of these developments with regard to carbon emissions control. Given the president's budget proposal, we expect to see cost and rate projections continue to increase.

As we work our way through this period of rising wholesale power costs, it is important that all elements of our three-tiered system are well equipped to answer questions from our members and other constituents. Most of the questions will relate to wholesale power supply costs, and the material in this briefing book is intended to equip you with accurate and timely information on why our rates are increasing.

As we proceed through this period of increasing costs on our electric rates, circumstances will continue to change, and as they do, we will update the information in this book on an ongoing basis.



Section 1 – Rates

Q Why are rates going up?

Rates are going up because the cost of producing electricity is going up. Your electricity is produced using a mix of fuels and technologies: wind, hydropower, natural gas, oil and coal. The costs for producing electricity from these sources are going up. As member load continues to grow – it is projected to increase 2.6 percent in 2009 – we meet that load growth with the lowest-cost generation first. In addition to the cost of fuel, as the load grows we have to move into using the more expensive generators.

Another significant cost is the cost of meeting environmental requirements, and that cost continues to increase. Our power supplier's fixed costs will increase nearly \$34 million in 2009. Much of this increase is cost to own the selective catalytic reduction equipment that has been installed at Thomas Hill Power Plant to meet the January 2009 federal deadline for controlling nitrogen oxides emissions.

Q Why are we having such a large rate increase?

A three-tiered system of cooperatives provides electric service to co-op members. One of those tiers is the cooperative that generates wholesale power. The wholesale rate increase effective April 1, 2009, is driven by four main factors. Member load growth, rising fuel costs, environmental requirements and increasing maintenance costs on existing power plants continue to put upward pressure on the cost of producing power for co-op members. Combining these factors, we expect our wholesale power supplier's costs to provide electricity to our members will be about \$140 million more in 2009 than planned for 2008. It is these cost increases that are driving the rate increase.

Q Isn't this a bad time for rate increases when the economy is in a slump?

We understand that the economy has placed a significant hardship on many members across the system. However, the costs for generating electricity continue to increase. As a cooperative, we must ensure that our rates are adequate to cover our current expenses and that we are planning to meet our members' load requirements in the future.

Q I've heard you've had several increases. How many and how much?

From 1985 to 2006 Associated Electric Cooperative, our wholesale power provider, had no rate increases. Like others in the electric utility industry, we enjoyed an extended period of rate stability with respect to our power supply. But starting in 2006, Associated has had to raise rates every year to generate additional dollars to cover our operating expenses in the following amounts:

2006 - \$31 million
2007 - \$20 million
2008 - \$122 million
2009 - \$78 million

Q Will there be any more rate increases?

It is very likely. There are growing pressures on the electric utility industry that are expected to increase costs substantially. These are due to the effect of anticipated federal carbon legislation, additional environmental controls, continued increases in fuel prices and the need for, and cost of, additional generating units to meet member load growth. The timing, as well as the size of these rate increases, has a wide range of uncertainty due to the uncertainty related to these cost drivers.

Q What costs make up my rate?

There are many costs that make up your wholesale power rate. The following provides a summary of total costs by category based upon actual results for 2008 and projected costs for 2009:

- Fuel & purchased power (net of interchange sales) – 45%
- Plant operations (labor, interest, depreciation, etc.) – 29%
- Other (transmission, headquarters) – 14%
- Plant maintenance – 12%

Q With other energy prices dropping, why are electric rates going up?

Wholesale power rates are set based on assumptions made in the fall. While prices at the gas pump have dropped since summer 2008, prices for other commodities have proven to be very volatile. Other prices paid by our wholesale power supplier are set by contract in advance. For example, the costs for coal to generate electricity at our wholesale power supplier's coal plants are established by contract and will increase by \$35 million in 2009.

Our power supplier has budgeted \$44 million more for natural gas in 2009 than in 2008. Prices for natural gas now are expected to be lower than they were in 2008. However, we are expecting to use more natural gas because our growing system will require more electricity than can be generated with coal.

In addition to fuel, our power supplier expects additional expenses of \$35 million in fixed cost, mostly related to the selective catalytic reduction equipment that was installed at Thomas Hill Power Plant in 2008. These costs cover the annual fixed costs for the equipment. Originally when the rates were set it was not expected that the SCRs would operate due to a court challenge to the law that required them to be built. Now the court ruling has been reversed, and it is anticipated that it will cost about \$9 million in unbudgeted operating costs for a total of \$12 million in 2009. In subsequent years operating costs are expected to be \$15 million a year.

Q What are you doing to keep costs down?

Our power supplier, Associated Electric Cooperative, continuously looks for ways to provide reliable power in the most economic way. Everyone from the board of directors to the staff understands that ultimately costs are paid by members. They are doing several things to keep costs as low as possible. First, every project is scrutinized to ensure the

expenditures are needed and that low-cost options are being used. Maintenance and updates at baseload coal power plants are scheduled so they occur during times of the year when energy consumption is lower, so they are available to generate when power is needed most. We also offer an energy efficiency program to reduce member load growth, thus reducing the amount of electricity we have to produce and delaying the cost of construction of future power plants.

Q Is there anything I can do to reduce my electricity bill?

One of the best ways to reduce your bill is to reduce your electricity consumption. In addition to doing things like adjusting your thermostat, cooperative members can take advantage of an energy efficiency program called Take Control & Save. The goal of this program is to help members take control of their energy use and cut down their energy consumption in smart ways. Reducing use will help members keep their electricity bills as low as possible.

Q Where are rates headed in the future, and what could increase them further?

Unfortunately, we're in a period of rising costs that include materials and equipment needed for producing electricity. We expect rates to continue to increase in the future.

The cost of constructing new generating units continues to increase, as does the cost of generating electricity with existing units. These costs are much higher than costs of existing power plants that were built years ago.

The cost of generating electricity to meet increasing load is also increasing. As load grows we have to generate more of the electricity required by members from gas-based power plants. These plants have a much higher fuel cost than coal plants. Of course, as more electric generation is needed, more fuel is required. Cost for coal is still increasing; however, if the coal marketplace cost adjusts down, we will expect to benefit from that. Although natural gas costs have been escalating the last several years, these prices have fallen in recent months. However, it is not clear how long these lower prices will persist. Our power supplier watches these costs every day.

But the biggest factors that we see increasing rates in the next 10 years are environmental regulations and new legislation. Some of the federal carbon legislation that has recently been proposed could raise rates by as much as 100 percent. In addition to carbon, the cost to construct expensive controls to capture other emissions from power plants could increase rates in the near future.

Q As a cooperative member, am I receiving AECL's lowest-cost power?

Our power supplier, Associated Electric Cooperative, uses the lowest-cost power plants whenever they are available to supply members. Associated typically serves member load first with low-cost hydropower generation when it's available, then with coal, wind, and natural gas. Associated also looks for opportunities to purchase power from other utilities at a cost that is lower than it can generate.

When a power plant is not available due to normal maintenance or an emergency, Associated either runs its own more expensive units or buys power, whichever option gives members the lowest cost.

Once member load is served, our power supplier may have opportunities to produce additional electricity and sell it to other utilities at a profit. Those profits, or margins, are then used to offset costs that would otherwise be borne by our members.

At our power supplier's control center, computer programs help ensure generators are operating for optimum efficiency so we can assure members receive the lowest-cost electricity.

Q I think co-op electric rates should be approved by the Public Service Commission. Why aren't they?

Cooperatives are not governed by the Public Service Commission because they are self-governed. Every member of an electric cooperative has a voice and a vote, which is the reason attending our co-op annual meeting is important. Members own and operate the cooperative. This member control exists at the local distribution co-op, the transmission co-op and the generating co-op.

Section 2 – Consumer concerns

Q My electric bill is just too high, and I'm not going to be able to pay it. What can you do for me?

There is a lot you can do to reduce your energy use. Our Take Control & Save program can help. The goal of this program is to help members take control of their energy use and find ways to cut down their energy consumption. Reducing use will help members keep their electricity bills as low as possible.

There is something else you can do. Make your voice heard about rising costs by visiting www.ourenergy.coop. There, you will have the opportunity to contact your elected officials to let them know that you are concerned about proposed energy legislation that will bring about further rate increases.

Q Is there anything I can do to lower my electricity bill?

We offer an energy efficiency program called Take Control & Save. The goal of this program is to give members ways to cut down their energy consumption and keep their electricity bills as low as possible.

Q How can I learn more about energy efficiency and energy conservation?

Our energy efficiency Web site, www.TakeControlAndSave.coop, is full of information and tips to help you learn about energy efficiency and what you can do in your home or business.

Section 3 – Financial

Q How high was Associated's net margin in 2008, and what were the main factors?

Associated's net margin for 2008 was \$57.7 million, not including \$20 million of revenue that was deferred to the Generation, Environmental and Insurance Fund. While the 2008 financial performance significantly exceeded projections, it was largely the result of non-recurring and uncontrollable factors of extraordinary hydropower and lower member loads than anticipated. While margins were above budget by \$33.5 million, the extraordinary hydropower alone contributed \$42 million to margins.

It is becoming increasingly important for Associated to use net margins to maintain equity levels. Due to recent changes in lending practice at Rural Utilities Service that eliminated the availability of low-cost financing for baseload generation, Associated will need to be able to access all sources of capital. Maintaining an appropriate equity level will help Associated obtain financing at a time of uncertainty in the capital markets and at a rate that will ensure a lower cost of energy long term.

Because investment in generation and environmental equipment is expected to be more than \$4 billion in the next 10 years, it is necessary to have margins higher than historical levels to maintain equity percentages at acceptable levels.

Q With such high net margins, why is Associated needing another rate increase in 2009?

Without the extraordinary hydropower Associated was able to buy in 2008, Associated would not have been able to meet its budget expectations. Loads were higher in 2008 than in 2007, which required more generation. Some of Associated's low-cost coal units were out of service at times during 2008 while environmental controls were being added.

While Associated's financial performance was strong in 2008, margins were largely driven by non-recurring and uncontrollable factors, such as extraordinary hydropower generation, that cannot be expected to repeat in 2009.

We also expect to see Associated's costs in several areas continue to increase in 2009 and beyond. For example, total coal expense is projected to increase \$45 million in 2009 from the costs budgeted in 2008. Fixed costs associated with the recently constructed environmental controls at Thomas Hill Power Plant and other assets are expected to increase total expenses by \$35 million over 2008 budgeted levels.

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Q What was done with the 2008 net margins?

The 2008 margins were largely used to pay for capital expenditures. In 2008, \$292 million was spent on capital expenditures. Of those total costs, only \$232 million was financed through borrowings. The remaining \$60 million of capital expenditures was paid for with cash, which included the 2008 margins. \$20 million was deferred to the Generation, Environmental and Insurance Fund.

Q What are Associated's credit ratings, and why are they so important?

Banks and other institutions rely on evaluations done by independent firms, known as rating agencies, to determine the quantity and pricing of lending money to different companies. Associated's credit ratings are "AA" with Fitch and S&P and "A1" by Moody's. These are some of the highest ratings given to any utility and provide Associated with access to much needed capital to finance large construction projects at lower interest rates.

With ongoing environmental upgrades and new generating resources planned to come on line in the next two years totaling about \$1 billion, the value of Associated's credit ratings in terms of potential interest savings has never been greater.

It is estimated that the difference between Associated's AA rating and an A rating, which is still very good, would be three-fourths percent or more than \$170 million in finance costs over 30 years for a \$1 billion loan.

Q How does building Associated's equity benefit member-owners?

Associated's equity level is a significant factor in determining its credit ratings and, therefore, the cost and quantity of capital it can access. Associated's current long-range financial forecast has a target of 18 percent equity. Attaining that equity level will allow Associated to borrow money at lower interest rates, reducing costs for years to come.

Q How much money will Associated need for capital investments in the coming years?

The current long-range financial forecast has projected capital expenditures for new generation and environmental upgrades of over \$4 billion in the years 2009-2018. An additional \$500 million will be needed in 2019 and 2020 to complete environmental upgrades at Thomas Hill.

Q How much money is in the GEIF? How will those funds be used?

Our power supplier, Associated Electric Cooperative, has a balance of about \$158 million in the Generation, Environmental and Insurance Fund. In the long-range financial forecast it is projected the GEIF will be used to pay for capital expenditures from 2010-2013.

Associated's board has the flexibility to use the GEIF to offset future unplanned costs to supply power to Associated's members if the need arises.

Q Why will the demand & expense allocation be changed in 2009?

A significant portion of the cost increases experienced over the last few years has been energy related, specifically fuel costs, yet the rate increases have applied evenly to the demand and energy rates that members pay. This has caused the revenue collected from energy and demand revenue to become out of balance with actual costs.

In an attempt to close this gap and bring the energy and demand rates in line with actual costs, Associated's board decided that beginning with the rate increase effective April 1, 2009, energy and demand rates would be set to match actual energy and demand expenses. The significant difference in the energy and demand rate increases in 2009 is driven by these changes.

Section 4 – Environment

Q With the threat of global warming, why aren't you relying on wind and other renewables instead of coal and gas?

In 2008, 11 percent of our power supplier, Associated Electric Cooperative's, electricity to serve member load was produced by renewable resources, including wind and water. Associated is buying all the power for 20 years from Missouri's first three wind farms, with additional in-state wind generation planned. Existing wind turbines, totaling 157 megawatts, are expected to generate the amount of electricity consumed by about 45,000 homes.

Hydropower from federal dams in Missouri, Oklahoma and Arkansas is another major renewable generating resource. These large hydroprojects do not qualify to meet renewable requirements in legislation that is under consideration.

We use a mix of generating resources and technologies to make sure we can deliver electricity at the lowest cost possible. While hydropower is our cheapest resource, it is a limited commodity dependent on rainfall and the capacity of lakes and dams to store the water.

Electricity produced by wind turbines actually costs more than electricity that is generated by Associated's coal plants. And because they operate between 25 percent and 35 percent of the time, wind turbines cannot supply the round-the-clock electricity needed by our members.

Also, wind cannot be relied on to produce electricity during periods of peak demand. Some form of electric generator that can be relied on to produce electricity when it is called for will have to back up the wind generators. Coal or natural gas baseload power plants that will operate around the clock will have a place among our power supply options for a long time.

Another technology we're relying on is energy efficiency. By providing incentives for members to reduce their electricity use through the Take Control & Save program, we're expecting to see load growth slow in the three-tiered system.

Q How are we going to be affected by the environmental initiatives of President Obama and legislation that is being considered in Washington?

The president has proposed, and the Congress is considering, legislation that proposes to control carbon emissions by pricing high-carbon-emission coal plants out of the market. The president's proposal is projected to add \$20 per ton of emissions to the cost of electricity production and would increase our average member's cost by about \$250 a year in 2012.

Some experts believe that instead of \$20 per ton of emissions, the cost could be as high as \$60 per ton, and that scenario would cost a typical homeowner about \$750 more a year for electricity.

This would collect over \$400 billion -- equivalent to the Department of Defense annual budget, and it would raise electric rates 75 percent or more.

Q Do we have ash ponds in Missouri like the ones in Tennessee?

Our power supplier, Associated Electric Cooperative, no longer disposes of fly ash in ponds at either of its two coal plants.

The New Madrid plant disposes its coal combustion residue in a permitted utility waste landfill. The New Madrid utility waste landfill is lined with a high density polyethylene liner and contains a leachate collection system, which is designed to prevent groundwater from being contaminated. The coal combustion residues are placed in the lined landfill where they set up very hard like concrete. The New Madrid plant conducts semi-annual groundwater monitoring to ensure there is no groundwater contamination.

The Thomas Hill plant uses coal combustion residues to reclaim abandoned open-pit coal mines. The EPA considers the use of coal combustion residues for mine land reclamation a beneficial reuse. The Thomas Hill plant conducts quarterly groundwater monitoring of the mine reclamation area to ensure there is no groundwater contamination. The mine pits are filled until the landscape is at the original contour of the previously undisturbed land.

Q Doesn't electricity from coal give off more carbon dioxide than any other type of energy?

Yes. Coal produces about twice as much CO₂ as gas-fired generation.

<u>Generation source</u>	<u>Tons of CO₂ emissions per MWh of generation</u>
Coal	1.0
Natural gas	0.4
Wind	0
Hydropower	0

Q What are you doing to research cleaner ways of producing electricity?

Algae testing – Our wholesale power supplier, Associated Electric Cooperative, and Central Electric Power Cooperative are sponsoring research by Lincoln University and Missouri University of Science and Technology to test the viability of growing algae in pools of water at Central Electric's Chamois Power Plant. The research will determine how well algae will feed on CO₂ emissions and capture some of the emissions from the plant's flue gas.

Carbon capture and storage –Associated Electric Cooperative is partnering with other Missouri utilities and the U.S. Department of Energy in a three-year project to determine the feasibility of sequestering CO₂ in a saline aquifer underlying most of Missouri.

Biomass - Since 2004, biomass has been used to produce green power at the Chamois Power Plant. Renewable fuels such as corn cobs, walnut shells, old railroad ties and turkey-processing sludge have been mixed with coal. Experiments like these help identify the most efficient form of biomass to reduce coal in electricity generation.

Q What do you do to clean up the emissions from burning coal?

Our wholesale power supplier, Associated Electric Cooperative, has invested \$1 billion since 1994 to reduce sulfur dioxide and nitrogen oxides emissions from its coal plants more than 90 percent. Associated will invest an estimated \$1.45 billion more during the next 10 years to install sulfur scrubbers at New Madrid and Thomas Hill power plants and bring the total reduction of SO₂ down by more than 99 percent.

In addition to sulfur reductions, these scrubbers are projected to reduce mercury emissions 80 percent to 90 percent to .0617 parts per million, which equates to 3.5 ping pong balls in an Olympic-sized swimming pool. Due to the design of the boilers at Thomas Hill and New Madrid power plants, a little more than two-thirds of Associated's coal-based generating capacity is already 30 percent below the mercury emissions of similar sized utility generators.

Even after spending \$2 billion to reduce SO₂, NO_x and mercury, additional controls may be needed to capture carbon emissions. Additional mercury emissions regulations also are expected in the next few years and will require additional controls.

Q Will Missouri's renewable energy standard lower my bill?

Cooperatives are exempted from the recent Missouri renewable energy standard. The amount of wind energy our power supplier receives from the wind farms would meet the Missouri requirements through 2013. Another wind farm is in the planning stages and would allow us to meet the requirements through 2017.

However, electricity from wind costs more than electricity from coal, which is used to produce most of our electricity. Wind power costs more than hydropower, and sometimes it costs even more than power generated with natural gas. Therefore, if Associated were covered by the renewable energy standard, it would place upward pressure on costs.

Q How much of my bill is due to environmental measures/costs?

In 2009, our power supplier, Associated Electric Cooperative, will spend \$180,000 per day or a total of \$65 million on environmental controls. This translates to roughly \$40 for the average retail member in 2009.

Associated Electric Cooperative has spent more than \$1 billion since 1994 to improve air quality. Associated projects it will have to spend about \$1.45 billion more in the next 10 years to install additional environmental equipment at New Madrid and Thomas Hill power plants.

Beyond the \$2.45 billion just mentioned, additional mercury emissions regulations also are expected in the next few years and will require additional controls at additional expense.

And the \$2.45 million does not include the costs of reducing carbon emissions. Congress is debating proposals for controlling carbon emissions. The legislation Congress decides to pass will determine how carbon emissions will be controlled, which will determine the cost.

Federal proposals to address global warming have included a cost per ton of carbon emitted ranging from \$20 to \$60 a ton. At the low end, \$20 per ton of carbon emissions would increase Associated's costs more than \$400 million annually by 2012. The average cooperative household's electric bill would go up about \$250 a year. A \$60 per ton carbon tax would cost Associated more than \$1 billion a year and increase a member's bill \$750 a year by 2012.

Section 5 – Renewable resources

Wind

Q Wind is free. What is the cost of your wind generation?

Cow Branch Wind Farm, the most recent project to supply electricity to our system, includes 24 wind turbines and cost about \$75 million.

The cost of wind generation has increased over the last several years from more than 4 cents a kilowatt-hour up to more than 7 cents a kWh for the most recent projects, and that's just to produce the wind energy. It still has to be delivered across country over transmission lines and to the cooperative member's home or business, and that adds more cost.

Most of this is capital cost, although maintenance costs also are included. Current projects benefit from a government production tax credit. This tax credit lowers the cost of wind by nearly 20 percent, and it is already accounted for in the stated price.

Q Why don't we generate more with renewables – especially wind?

Electricity produced by wind turbines actually costs more than electricity that is generated by Associated's coal plants. Some of the time wind power is cheaper than power

generated with natural gas, but not always. And because wind turbines operate between 25 percent and 35 percent of the time, they cannot supply the round-the-clock electricity needed by our members. Also, wind cannot be relied on to produce energy during periods of peak demand.

In 2008, 77 percent of all the electricity used on our system came from coal, which costs the least to produce. Wind produced 1 percent of the electricity required by co-op members. Even though our power supplier has purchased all of the output from Missouri's first three wind farms, this supply met only 1 percent of members' electricity requirements in 2008.

When the three wind farms reach full production, our power supplier estimates they will generate power equivalent to the electricity use of about 45,000 homes.

Renewables, in general, cost more than conventional sources of electric generation. Wind is generally one of the most cost-effective forms of renewable energy, however, wind generation is not very reliable and needs other controllable generation to support times when demand is high and the wind is not blowing.

Q What does wind energy actually cost me?

As a member of _____ Electric Cooperative, your rate (unless you have subscribed to a green power program) includes power from the lowest-cost resources our power supplier can find. Costs vary in different situations. Our power supplier, Associated Electric Cooperative, has contracted for wind generation at a fixed price for 20 years.

The cost of wind generation has increased over the last several years from more than 4 cents a kilowatt-hour up to more than 7 cents a kWh for the most recent projects, and that's just to produce the wind energy. It still has to be delivered across country over transmission lines and to the cooperative member's home or business, and that adds more cost.

Associated expects to avoid some natural gas purchases by using this wind generation, and over the course of the 20-year contract Associated expects to see a net savings compared to costs from new generators. Pending federal legislation, such as a national carbon tax, as well as prices for fossil fuels, can affect the cost effectiveness of wind.

Q Why has Associated Electric Cooperative decided to participate in additional wind projects?

The decision to add more wind generation is largely based on the wind farms' being an economical power supply. Project risks and the risks of changes in the industry also play a role in the decision-making process. However, President Obama has proposed, and the Congress is considering, legislation that would require our power supplier to acquire additional higher-cost renewable resources.

Q I'd like to see more of my electricity coming from wind and solar; why isn't that happening?

This is happening.

In 2008, 1 percent of our member load was served with wind generation.

Our power supplier, Associated Electric Cooperative, has purchased all of the generation for 20 years from Missouri's first three wind farms, which total 157 megawatts.

When the three wind farms reach full production, our power supplier estimates they will generate power equivalent to the electricity use of about 45,000 homes. And we expect to add more wind capacity in coming years.

We are always open to evaluating economical options for adding power supply to the system, including wind and solar generation. To satisfy the growth in electricity demand, we must look at all cost effective generation resources that are available, including natural gas, nuclear, biomass, hydroelectric, wind and solar. In addition, we will continue to implement energy efficiency and equipment rebate programs that reduce energy consumption, as well as the need for new electricity plants.

Hydropower

Q If hydropower is lower cost and environmentally friendly, why aren't more dams being built?

Locations for building hydropower projects (dam and associated reservoir) are very limited. Missouri already has a number of federally operated reservoirs that supply power to the electric cooperatives through the Southwestern Power Administration. Adding hydropower dams is constrained by a lengthy permitting process and potential environmental impacts. A few developers in Missouri are working on under-water stream turbines that do not require dams and may have a lower environmental impact.

Biofuels

Q Can you tell us more about the algae project?

Associated Electric Cooperative and Central Electric Power Cooperative are co-sponsors of the project being conducted by researchers at Lincoln University of Missouri and the Missouri University of Science and Technology. Algae collected from water sources local to the Chamois Power Plant are growing in five pools erected at the plant.

The research will determine whether algae will use energy from sunlight to feed on CO₂ in the flue gas and capture the CO₂. An additional benefit is that the oil found in algae can be processed into a biodiesel fuel.

Q What other alternative energy sources may be options in our area?

Wind energy, landfill/agricultural gas and biomass generation are probably the most promising options in our service area at this point. With changes in economic and

technology conditions, more alternative energy sources could become competitive. Energy efficiency is not an alternative energy source, but it does have considerable potential for reducing members' electric use and bills.

Section 6 -- Reducing electricity use

Take Control & Save

Q Why are you spending money on rebates when my rates are going up?

As the costs for fuel and environmental controls continue to rise, the cost of additional generating equipment also increases. The Take Control & Save program is designed to help members use electricity more efficiently. It actually costs less for our power supplier to provide financial incentives for members to use less energy than it does to pay the costs associated with generating that extra energy. Every kilowatt-hour that isn't used is a kilowatt-hour that doesn't have to be generated.

Q What impact has Take Control & Save had so far?

To help members use electricity more efficiently, we launched this energy-efficiency program in 2008 with a goal of saving a total of 1.9 million megawatt-hours (MWh) by 2032 throughout the co-op system. The program includes home energy audits; weatherization incentives; appliance, heating and cooling rebates; distribution of compact fluorescent light bulbs (CFLs); pilot projects; and educational seminars. In less than a year, our power supplier distributed 1.7 million CFLs. In 2008 the program is estimated to have saved 59,000 MWh and avoided 60,000 tons of CO₂ emissions, an amount equivalent to removing 10,400 cars from our roads.

Q CFLs contain mercury. Why are you promoting the use of a product that harms the environment?

CFLs contain a very small amount of mercury, sealed within the glass tubing — an average of four milligrams. That's about the amount that would cover the tip of a ballpoint pen. By comparison, older thermometers contain about 500 milligrams of mercury — an amount equal to the mercury in 125 CFLs. Because most of the mercury vapor within a CFL becomes bound to the inside of the bulb as it is used, only about 11 percent, or 0.44 milligrams, of the mercury remains free in the CFL at the end of its life.

Because CFLs contain a small amount of mercury, the Environmental Protection Agency recommends the following clean-up and disposal methods:

If a CFL burns out:

Recycle used CFLs if you have the option. If recycling is not an option, seal the CFL in two plastic bags and dispose of it at your local household hazardous waste collection site or place it with your regular trash.

If a CFL breaks:

Do not use a vacuum, broom or your hands. Open nearby windows and leave the room for 15 minutes. Sweep up any fragments with a piece of cardboard or stiff paper. Use tape to pick up any remaining pieces. Wipe area with damp paper towels. Seal everything in two plastic bags and place the bags outside with your regular trash. Never burn used or broken CFLs.

Q Where can I learn more about programs to reduce my electric bill?

Our staff can help you. And you can visit our Web site, at www.TakeControlAndSave.coop for tips that you can use in your home or business.

Section 7 -- Load

Q What does load growth have to do with costs increasing?

We use a variety of fuels and technologies to deliver power, and some cost more than others. Coal, for example, is our lowest-cost fuel so we use it as much as possible to supply members.

Our situation today is that the last of our coal plants was built in 1982, and we have essentially used up all of that capacity.

As the demand for electricity grows, we are now relying more on fuels like natural gas that are more expensive for generating electricity, and this is one of the reasons rates are increasing.

There are two ways load growth can increase costs. 1) Additional generation or purchases are required to meet the additional load. Typically this additional energy is at a higher rate than the existing energy. 2) The additional load growth exceeds the capacity available from the existing system. The cost for building the additional generating units results in an increase in rates.

Q How does Associated plan for load growth?

Associated performs an annual evaluation of the impact of forecasted load growth. The forecast includes 20 years, but Associated's staff focuses on the first 10 years. Various sources of generation are evaluated against each other to determine the lowest-cost option to meet the additional load requirements.

To meet anticipated member load growth, our power supplier has two natural gas plants under construction. The first to come on line will be a 103-megawatt simple-cycle unit at the existing Essex Power Plant. This unit is expected to come online in 2010. The second will be a 540-megawatt combined-cycle plant at the existing power plant in Chouteau, Okla. This plant will come online in 2011. In the long term Associated is looking at options for participation in a nuclear project.

Q How much are loads expected to grow?

The current load forecast for our system, which includes data from each of the 51 distribution cooperatives, shows growth of 2.2 percent per year from 2008 to 2027. Peak demand is expected to grow an average of 1.8 percent per year over the same period. Projected U.S. load growth over the same time period is 1 percent per year, according to the Energy Information Administration.

Q What led to the lower loads in 2008?

Member loads for the entire system that serves our cooperative were higher in 2008 than in 2007. However, loads were lower than budgeted for 2008, which is not fully explained by weather conditions. We suspect that the downturn in the economy, coupled with gasoline prices in the vicinity of \$4/gallon, created a reduction in the number of new members coming onto the 51-co-op system and caused existing members to reduce their usage of electricity particularly during the summer cooling months.

Section 8 -- Fuels

Coal

Q What is causing the cost of coal to go up?

The United States has prolific coal reserves. Coal has been mined in the U.S. extensively over the past century. Coal that is easy to mine is most sought after by mining companies. Thick underground seams or shallow surface mines are less expensive to develop. These easy to develop reserves are getting scarcer. This requires mining companies to dig deeper and develop less sought after coal seams. Digging deeper is more expensive.

Developing countries around the world have a great need for energy. Coal is one of the least expensive fuels to use for energy and steel production. The international market for coal really heated up last year. Metallurgic coal prices increased dramatically based on demand from developing countries. Substitute coal followed suit. As a result, coal prices across the board went up.

Finally, supply for the international market was strained in 2008. China had mine problems and reduced exports. Australia had rail and port issues which reduced its exports. South Africa had transportation issues and reduced exports. These supply shocks sent international prices up. Buyers looked to the United States, with its ample reserves, to fill the gap. Therefore, domestic prices were driven up by international buyers.

Q Is there really any such thing as clean coal?

Coal is our most abundant domestic fuel. About one-half of the electricity generated in the United States comes from coal. In the past we have been successful in developing technology to address environmental concerns about generating electricity with coal. The power plants that generate our electricity have been modified with more than \$1 billion in

environmental equipment. This equipment is already reducing sulfur dioxide and nitrogen oxides 90 percent, and more environmental controls will be added.

The air in the United States is cleaner today than it has been since 1970. Between 1980 and 2007:

- gross domestic product increased 124 percent
- vehicle miles traveled increased 103 percent
- energy consumption increased 30 percent
- U.S. population grew by 33 percent

During the same time period, total emissions of the six principal air emissions (carbon monoxide, lead, nitrogen oxides, volatile organic compounds, particulate matter, sulfur dioxide) dropped by 52 percent.

Technology makes it possible to use coal to generate electricity and still meet today's stringent environmental standards. With investment in technology our abundant coal supply can remain a source for clean and affordable electricity.

Q What is Associated doing to help with the research of cleaner ways to burn coal?

Associated and Central Electric Power Cooperative are co-sponsors of a project being conducted by researchers at Lincoln University of Missouri and the Missouri University of Science and Technology to learn how algae can consume CO₂. The research will determine whether algae will use energy from sunlight to feed on CO₂ in the flue gas emissions, thus capturing the CO₂. The oil found in the algae can then be processed into biodiesel fuel.

Associated has partnered with other Missouri utilities and the U.S. Department of Energy in a three-year project to determine the feasibility and costs of sequestering CO₂ in a saline aquifer underlying most of Missouri, including the Thomas Hill Energy Center.

Associated also is the first and only utility in the state to join the Chicago Climate Exchange, a voluntary organization working to reduce carbon dioxide emissions that has provided staff with information and experience on emissions trading.

Natural gas

Q What is driving the cost of natural gas?

The gas market in the United States is influenced by: 1. supply (production and imports); 2. demand, such as industrial, home heating and power generation; and 3. storage. The U.S. is one of the few countries that has the capability, due to specific geography, to store large amounts of natural gas. Conventional gas supplies, gas pockets or bubbles underground, have been tapped for over a century, and are beginning to dwindle. Domestic production has shifted to unconventional supplies. They are plentiful but more expensive to extract. As conventional supplies diminish and unconventional resources are tapped, costs will go up.

Competing with domestic supplies is imported gas. International supplies of conventional gas are abundant. But, to be imported, it must be liquefied and shipped on tankers to the U.S. Liquefied natural gas (LNG) is poised to fill any supply gap that the U.S. experiences. LNG is an international commodity and is subject to price signals from the world market. Other countries have been willing to pay more for LNG than the U.S. markets, and as a result, LNG has yet to help reduce gas prices in the U.S.

Pending federal legislation is highly likely to be a key factor driving the cost of natural gas. Currently proposed carbon legislation favors natural gas to coal. This legislation adds to the cost of using coal as a fuel, making natural gas more competitive. Increasing cost of coal generation creates an incentive for electric utilities to use more natural gas. Utilities will only be able to build gas. This new demand likely will drive up the cost of gas because new production must be added to meet the demand.

Q Natural gas costs fluctuate a lot; what are you doing to manage that?

Our power supplier, Associated Electric Cooperative, combines financial instruments with physical gas purchases to help reduce the volatility associated with the cost of natural gas. These agreements extend three years into the future to help stabilize costs. Associated also seeks long-term gas transportation agreements to help stabilize the delivered cost of gas.

Q Where does the natural gas come from to produce my electricity?

Natural gas for generating our electricity comes from domestic supply. Most of it comes from shale in the panhandle area of Texas and Oklahoma, and the rest comes from the Gulf area.

Section 9 – Other

Q Why is Associated building a new headquarters building in the middle of these rate increases?

In the last 10 years, Associated's electric generation requirements and its business operation have grown significantly. The generation portfolio has seen the addition of six natural gas plants and three wind farms. Significant environmental regulations have led to increased monitoring and compliance requirements. New emissions credit markets now require the tracking of credits associated with multiple emissions. Finally, significant compliance initiatives in areas such as transmission, system operations and cyber security have been added. Each of these functions, and many others, has required additional staff to manage.

The current headquarters building, which was last expanded in 1982, is now full. It is expected that future years will see continued growth in the business operation, which will require continued increases in staffing levels. This increased staff will require additional space.