Associated Electric Cooperative Inc.

A Touchstone Energy® Cooperative

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An equal opportunity employer and provider/disability/veteran.

Annual Report 2016

Associated Electric Cooperative Inc.

The fine-tuned machine

The fine-tuned machine

Associated Electric Cooperative is like a complex, fine-tuned machine, comprised of many parts that work together to achieve its mission of providing an economical, reliable power supply and support services to its members.

Actually, Associated Electric is part of an even bigger machine. It became part of that three-tiered machine in 1961, when it was formed by six generation and transmission cooperatives to provide them a wholesale power supply.

Since then, Associated's G&T owners have continued to play the important role of building, operating and maintaining the high-voltage transmission facilities that take the power generated by Associated to the top tier of cooperatives: the 51 distribution systems in Missouri, southeast Iowa and northeast Oklahoma.

These local distribution electric cooperatives are owned by about 875,000 members – nearly two million member-consumers at the end of the line.

Associated's resources for serving this three-tiered, member-owned system include a mix of coal, natural gas, wind and hydropower resources; an energy efficiency program that helps members save on their electric bills; an integrated, high-voltage transmission system; and about 650 full-time, skilled employees working at three main locations.

The Association of Missouri Electric Cooperatives, the Iowa Association of Electric Cooperatives and the Oklahoma Association of Electric Cooperatives also are an important part of this cooperative machine made to serve members.

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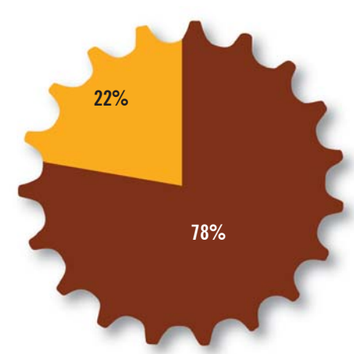
Associated's 2016 annual report was written, compiled and produced by the staff of Associated Electric Cooperative.
Cover art: Glennon Scheid and Robin Harrison
Editor: Linda Putman
Graphic designer: Glennon Scheid

2016 highlights

Financial (in thousands)	2016	2015	Increase (Decrease)	% Increase (Decrease)
Operating revenue	**$1,093,545**	$1,090,790	$ 2,755	0.3
Operating expenses	**992,376**	994,779	(2,403)	(0.2)
Interest expense on long-term debt (less interest capitalized)	**80,281**	82,837	(2,556)	(3.1)
Net nonoperating income	**21,197**	22,073	(876)	(4.0)
Net margin	**42,085**	35,246	6,839	19.4
Operational				
Energy sales (MWh)				
Members	**17,879,974**	17,924,012	(44,038)	(0.2)
Nonmembers	**5,098,943**	4,595,969	502,974	10.9
Member revenue per kWh sold (mills/kWh)	**51.57**	51.16	0.41	0.8
Peak hour member demand (MW)	**4,379**	4,506	(127)	(2.8)
Total capacity (MW)	**5,700**	5,891	(191)	(3.2)
Net generation (MWh)	**19,818,332**	19,453,113	365,219	1.9

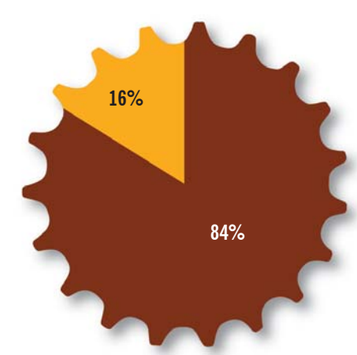
Kilowatt-hour sales
(kWh in millions)

Members 17,880
Nonmembers 5,099



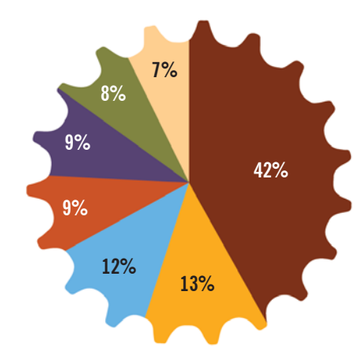
Operating revenue
(dollars in millions)

Members $922
Nonmembers $172



Operating expenses
(dollars in millions)

Generation operation $416
Contracted generation $131
Power purchased $121
Depreciation and amortization $93
Transmission $89
Generation maintenance $74
Administrative and general, taxes and accretion $68



A fine-tuned machine

Message from the president of the board

A new driver can mess up a high-performance machine with inexperience, too many changes or neglect. The same can be said for a high-performing organization like Associated Electric Cooperative, which has been finely tuned to meet the needs of its member-owners.

2016 brought such a change in the driver's seat for Associated with the retirement of Jim Jura, our longest serving CEO and general manager, and the hiring of David Tudor – only the cooperative's fourth CEO in its 55-year history. The transition was planned and purposeful due to the work of the board of directors, Jim, David, our executive team and employees. As a result of their efforts, Associated – which David has dubbed "The Machine" – never misfired. The many parts of this organization remained focused on our mission while meeting a number of challenges and returning a year of strong performance that is highlighted in this report.

Jim, who announced his retirement in the fall of 2015, continued to lead Associated in the early part of 2016 while our board of directors conducted a nationwide search, using the well-known firm of Mycoff, Fry & Prouse LLC, to find his successor. We used a deliberate, thorough process, which was the right thing to do. We took our time and considered a number of excellent internal and external candidates – which is a tribute to Associated's reputation.

United, the board hired David, an executive with 30 years' varied experience in the energy industry that complements our past and prepares us for the future. The board announced its decision March 31, and David started work even before his first official day of May 16, overlapping with Jim as part of the plan for a smooth transition.

I am particularly pleased that David was able to travel with Jim to each of our six owner G&T's annual update meetings, allowing David to meet most of the board members and managers from the 51 member distribution cooperatives. In addition, Jim introduced David to several of Associated's strategic partners, our statewide associations and the three major bond rating agencies. This process allowed Jim to provide David with valuable insight into the history and inner workings of the three-tiered system, as well as position him to continue those strategic alliances.

We honored Jim at our annual meeting last June. More than 800 members and guests turned out to recognize Jim and his legacy of service to members as Associated's CEO from August 1991 to June 3, 2016. Jim can take great pride in Associated, which he has helped to position as one of the most respected, lowest-cost G&Ts in the country with top member satisfaction ratings.

David has jumped right in to continue that legacy while planning for the future. Development of a long-term strategic plan – the roadmap for the Associated machine – kicked off shortly after David started and will be a key focus in 2017. While Associated is in very good operational and financial condition today, it remains important that your board and executive team concentrate on the future of the cooperative.

The transition continues, but change is something we are used to in our business. Our strength is our cohesion through change, and that's evident in our board's steadfast focus on our core business – even when its makeup changes. Last year, we honored the longtime contributions of R. Layne Morrill of KAMO Power, whose cooperative service spanned four decades. He served 14 years on Associated's board with the last 12 years as secretary. Known for his passionate commitment to political action on behalf of electric cooperatives, Layne often led the fight against harmful legislation, and his service extended from local community development to national organizations.

We then welcomed John E. Hibdon to our board. He has 20 years' service on the board of his local cooperative, Verdigris Valley Electric Cooperative in Collinsville, Okla., and has served on KAMO's board since 2009. A business owner and certified public accountant, John will be an asset to our board of directors.

I am optimistic and excited to be a part of the future of your wholesale power generator, a well-maintained and efficient machine. I look forward to working with the board, David and the pit crew of many talented employees who are committed to making Associated successful for you, our member-owners. As always, I count it a privilege to serve you.

President Geisendorfer presents Jim Jura, retired CEO of Associated, and his wife, Sylvia, a resolution from the National Rural Electric Cooperative Association that recognizes Jim's years of service to cooperatives.

Associated recognized Branson-area businessman Layne Morrill for his four decades of service to the three-tiered system.

Emery O. Geisendorfer, president
Associated Electric Cooperative Board of Directors

A fine-tuned machine

Message from the CEO and general manager

I have nicknamed Associated "The Machine," largely due to the fact that the cooperative's people, processes and procedures are so strong and support a diverse and flexible set of generation and transmission assets. The daily coordination between the organization's leadership and employees is simply excellent.

One of Associated's board members challenged me when I joined the G&T to be cautious when making changes to the machine, recognizing the potential cascading effect of a poorly thought-out change.

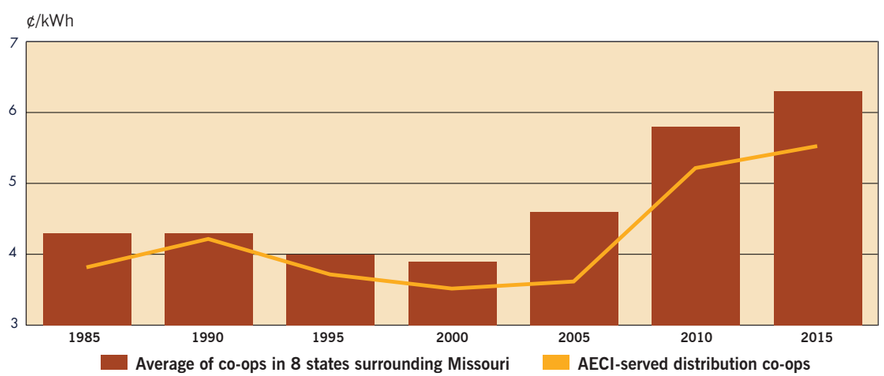
Change ultimately can affect the cost and reliability of the electricity we generate, and it only takes a storm like the one we saw in early March that brought 33,000 power outages to members' homes and businesses to remind us of the importance of that electricity. Our three-tiered system has a material impact on our members' lives, both positive and negative.

In my first few months at Associated, I have found a deep understanding of that importance through the consistent and relentless focus by the employees on our member-owners. Our people truly know their duty to provide them reliable, affordable electricity.

That commitment was evident in 2016, when Associated had another successful performance year among all of its divisions. Highlights include:

- Strong safety metrics across the organization
- Operations and maintenance costs of its generating fleet $7.8 million under budget
- Record performance of natural gas units
- Rating agency confirmations of our financial strength
- New RUS financing
- Upsizing and renewal of bank lines of credit
- Above-budget margins
- Compliance with new standards for mercury reductions and coal ash handling
- Successful results from a cybersecurity audit by SERC Reliability Corp.

Associated machine provides members a competitive wholesale power supply



Member distribution cooperatives served by Associated Electric Cooperative and its six owner G&Ts overall continue to buy power at a lower cost than the average paid by nonmember distribution cooperatives in eight states surrounding the three-tiered system, according to the latest data from the National Rural Utilities Cooperative Finance Corp.

New CEO David Tudor made touring the power plants and visiting with Associated's workforce priorities during his first months on the job. With him at New Madrid Power Plant are, from left, clockwise, Ken Wilmot, vice president, Power Production; Brian Prestwood, general counsel; Roger Neumeyer, plant manager; Matt Hanson, assistant plant manager; David; and Buddy Hasten, managing director, plant operations and reliability.

Associated also conducted an employee engagement survey in 2016, allowing for valuable feedback as to what we can do to make the cooperative better. We established employee-led teams to review the results and develop plans to make improvements.

Employee value is one of the company's six core values that are the foundation for the machine and are part of the culture of the organization. My 2016 objective was to avoid making any changes that might disrupt the machine. I support these core values and will continue to focus our team on these in the future.

In addition to our normal goals and objectives, our overall 2017 objective will be to provide members with a well-designed, long-term strategic plan that will allow the machine to continue its success. Our nine cross-divisional teams have begun the tedious work necessary to develop options for the Associated management and board to consider. We also are developing the member communication plan to involve them as we start getting results from our teams.

Finally, I have to thank the entire membership for welcoming me into the Associated three-tiered system. So many of you have given me your trust before it has been earned – I plan to earn it. Your previous CEO, Jim Jura, was very helpful in my transition into the role, and the management team and employees have been great to me. My wife, Jenni, and I have relocated to Springfield and look forward to serving our members in the years to come.

Thank you for the opportunity to lead this great cooperative.

David J. Tudor, CEO and general manager

The complex machine

A machine is defined as an apparatus with one or more parts that uses energy to perform a particular task. Each part has a definite function, and together the parts of a complex machine must interlock, crank, turn and operate in fine-tuned harmony to achieve high performance and desired outcomes.

Associated Electric Cooperative is that well-oiled, fine-tuned machine, comprised of many parts working together and fueled by the energy of its employees to achieve the mission of providing members with affordable, reliable electricity and support services.

The machine overcame numerous roadblocks in 2016, including low member load, mild temperatures, historically low natural gas prices, low energy market prices, reduced availability of the coal generating fleet, loss of budgeted transmission revenue, meeting new environmental rules, record coal stockpiles and a transition in leadership.

Challenges bring opportunity though, and the Associated machine, from its leadership to its workforce, is synchronized and tuned to serve members. The cooperative used its diverse resources to conquer challenges, achieve objectives and return a strong financial year. In 2016, the cooperative:

- Recorded a net margin of $42.1 million, exceeding budget.
- Returned $11.9 million in patronage capital to its six owner generation and transmission cooperatives, bringing the total returned since 1993 to $188 million.
- Retained $4.6 million in the Deferred Revenue Fund, set aside in prior years to provide rate stability for member systems, and $117.9 million in its Generation, Environmental and Insurance Reserve Fund. Both funds give the cooperative financial flexibility to manage any future challenges.

Machine meets challenges

Associated continues to build a world-class reliability-centered maintenance program to improve coal fleet performance, operations and maintenance costs and change management. This program and extraordinary efforts by employee pit crews in 2016 reduced fleet operating and maintenance expenses $7.8 million below budget.

This performance helped the machine conquer challenges in 2016, including:

- Noranda Aluminum closed its smelter in southeast Missouri, immensely affecting the local community. The closing also eliminated about $8.5 million in budgeted 2016 revenue for Associated, which provided transmission service to the smelter.
- Member load was 6.5 percent below budget, bringing in significantly less revenue ($37 million below budget). Like many utilities across the country, Associated's members continue to see minimal load growth – a trend experienced since 2008. Weather is a variable factor influencing load, and 2016 experienced mild winter temperatures throughout the system. Members' summer peak on Aug. 4, 2016, was 3,955 megawatts, and the winter peak set Dec. 19, 2016, was 4,379 MW, compared with Associated's all-time peak of 4,598 MW set Jan. 6, 2014.

Associated's board of directors, which balances Associated's strong financial position with keeping member rates affordable and stable, annually reviews wholesale power supply rates. After deliberation, the board approved a 3 percent rate increase, effective April 1, 2016, to ensure financial strength and flexibility. It was the first rate increase since 2009 and was less than the forecasted rate increase communicated to members through regular meetings.

Associated strives to keep rates stable, knowing no rate increase is easy on members. As a result, it continues to be one of the lowest-cost G&Ts in the country. Member distribution cooperatives pay less for their power than the average paid by nonmember distribution cooperatives in the surrounding eight states (see chart on Page 4).

Due to its strong financial position, Associated is able to access capital at very favorable interest rates. In 2016, Associated meticulously worked with the U.S. Department of Agriculture Rural Utilities Service to update its indenture and secure a $190 million loan for generating plant equipment. Associated received a draw on that loan Dec. 29 of $71.7 million at 2.83 percent, providing significantly lower borrowing costs for Associated and its members. It also increased and extended its line of credit with National Rural Utilities Cooperative Finance Corp., extended its line with Branch Banking and Trust Co., and increased its line of credit with CoBank. Overall, Associated increased its liquidity facilities a net $50 million.

Strategic partnerships with lenders, as well as Associated's reputation, are pieces of the machine that are key to its success. Evidence of this fine-tuned machine's performance: All three major bond rating agencies affirmed Associated's stable outlook and credit ratings, which are among the best in the nation. Associated earned an AA rating from Standard & Poor's; Aa3 rating from Moody's Investors Service; and an AA- rating by Fitch Ratings.

But numbers are just a piece of the story told through this machine metaphor. Associated's strengths reside in the many parts of the three-tiered system that it serves, including its board of directors and executive team; its innovative workforce; well-maintained, diverse resources; and open communication with member-owners.

Many things tie this system together, and its cohesion is illustrated by the all-requirements contracts that members extended in 2015 out to 2075. These contracts bind the system and are a vote of confidence in Associated's ability to meet all members' energy needs.

Journeyman welder/mechanic Eric Canady and journeyman machinist/mechanic Mike Smith work together to rebuild a sump pump at New Madrid Power Plant.

Inset: Thomas Hill Energy Center

Diverse resources
give competitive edge to members' machine

The Associated machine succeeded in 2016 market conditions due to the foresight of its leadership to develop, own and maintain generating resource diversity. Associated added its first natural gas plant in 1999, followed by more natural gas, dual-fuel units and utility-scale wind energy.

Making the machine diverse equals reliability for members and flexibility to manage the rocky road of fuel prices and energy market conditions. That strategy paid off again in 2016 when natural gas prices were at a 20-year low, affecting the energy market that also was influenced by mild temperatures, low loads and increased renewables.

Associated chose to dispatch its gas-fired generation at record levels, providing members with power below coal energy prices. This makes for challenging operations when gas competes with coal, but members gain savings. For example, Feb. 1 through March 31, Associated's efficient combined-cycle gas units ran for about $2.40 a megawatt-hour less than its coal units, saving about $1.6 million on serving member load.

Serving members is Associated's mission, and keeping that electricity affordable is a critical part of the members' machine. To aid in that work, Associated uses members' resources to bring in revenue that helps offset costs otherwise borne by member-owners. In 2016, however, nonmember energy sales were at market prices about 15 percent below budget.

Associated's power marketing staff also has negotiated agreements to sell capacity and call-option transactions. Term sales can be advantageous in the current market to maintain sales volumes and lock in revenue.

Along with fluctuating market conditions, industry changes have lessened energy sales with traditional counterparties. However, Associated prepared and positioned itself to conduct energy marketing business where it traditionally had not operated. In 2016, that trend continued as more of Associated's nonmember sales were to regional transmission organizations, or RTOs, than in previous years.

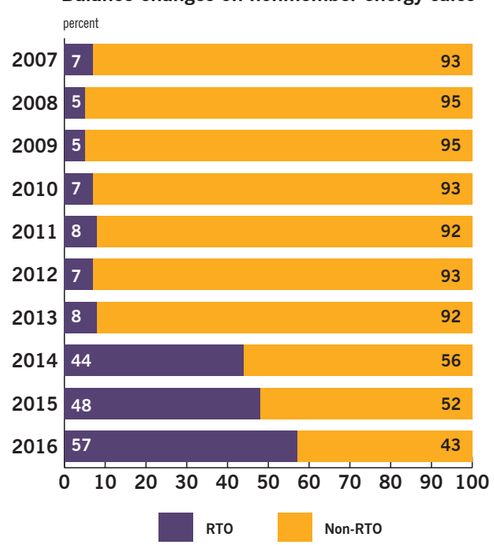
Associated continues to possess the leadership, resourceful staff, connections and access to take advantage of market opportunities when available, and to track, prepare and strategically plan for industry changes. Staff works to preserve Associated's ability to reliably move its own generation to load and to be fairly compensated for use of its transmission system. The cooperative works closely with and supports its neighboring RTOs, which are MISO and Southwest Power Pool, and other transmission owners like the Tennessee Valley Authority to assure reliability.

Fleet adapts to 2016 market conditions

2016 conditions contributed to all-time records for gas generation at Associated, as well as an all-time low for coal generation.

Nationally, the U.S. Energy Information Administration reported 2016 natural gas prices averaged $2.49 per million British thermal units at the Henry Hub trading point – the lowest annual average price since 1999.

Balance changes on nonmember energy sales



As the industry has changed, and more utilities have joined regional transmission organizations, Associated has adapted and experienced an increase in its sales to RTOs and decrease in sales to independent counterparties.

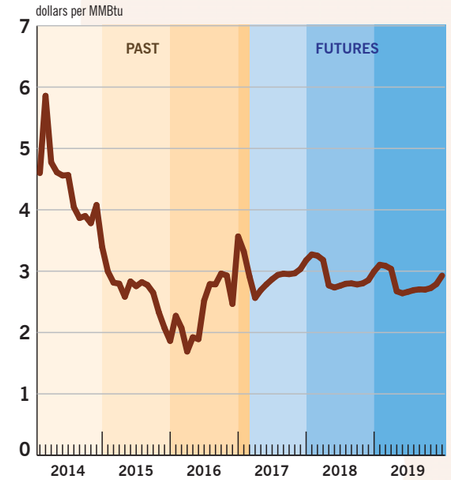
As a result, natural gas surpassed coal as the primary generation fuel in the U.S., supplying one-third of the nation's electricity in 2016, according to the EIA.

Natural gas and oil prices have recovered some from 2016 lows and are projected to be higher in 2017; however, energy commodities remain low by historical standards and will continue to be seasonally volatile based on weather. A broad view held in the industry: gas and oil prices overall will remain lower for several years to come.

Gains in technology and efficiency have lowered the cost of gas and oil production, as well as made renewables (solar and wind) more competitive. Tepid load growth and three straight warmer-than-average winter heating seasons also are contributing factors.

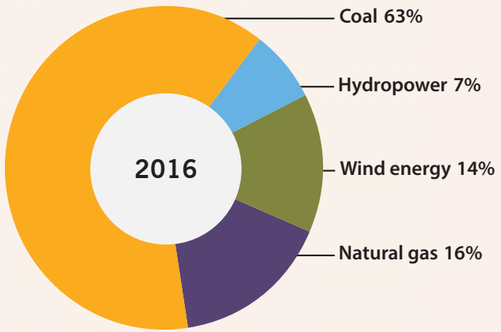
As the volatility in commodities remains unpredictable over the long term, Associated remains well-positioned to manage challenges with its diverse generating assets, integrated high-voltage transmission system, focus on core business and long-term strategic planning.

Predictability not always in the pipeline

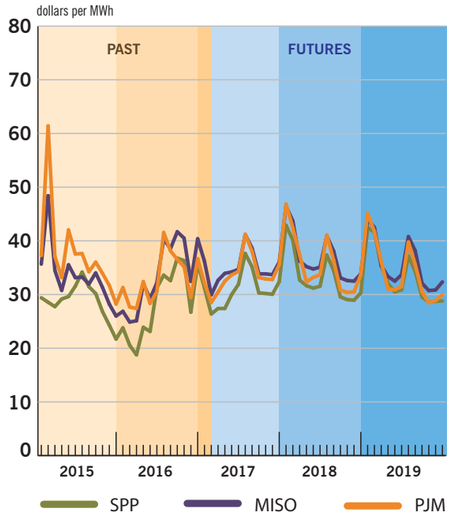


Source for Henry Hub natural gas prices is Platts.

Diverse resources serve member load

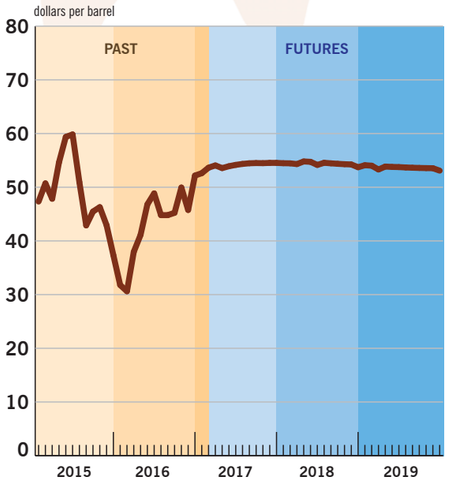


RTO energy prices fluctuate



Sources: PJM AEP Dayton hub, PJM AD hub, MISO Indiana hub, SPP South hub

Oil prices projected to stabilize



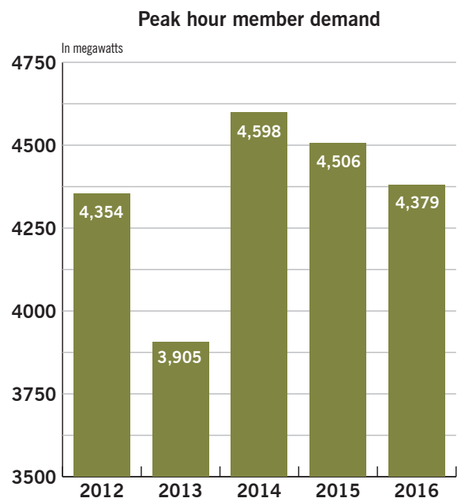
Source for West Texas Intermediate (WTI) crude oil pricing is EIA.

Transmission lines bring power to the people

Another vital part of the Associated machine is the integrated, high-voltage transmission system. Without it, the machine is like a souped-up race car on blocks – there's nowhere for the power to go.

Constructed and collectively maintained by members, transmission facilities deliver electricity to the six G&T owners, enable Associated to efficiently meet member needs, to buy power when needed or more economical, and to transfer and sell energy not needed by members to other entities.

Associated and the six G&Ts collaborate to plan, protect and invest in high-voltage transmission facilities and technologies that ensure reliability for members and full compliance with increasing requirements of the North American Electric Reliability Corp. They also coordinate with neighboring utilities in an open, transparent process to ensure regional transmission reliability and full compliance.



In 2016, Associated and the G&Ts invested $29.5 million on primary transmission facilities, which are those energized at 138 kilovolts or higher, to serve the entire system. Associated spent another $7.5 million on capital transmission projects to improve reliability.

Looking ahead, Associated's board has approved a 10-year, long-range transmission plan with a projected $120 million investment in new primary transmission facilities to serve members.

In addition, each G&T invests in secondary facilities – those energized at less than 138 kV – to serve their respective member-owner distribution cooperatives. In 2016 the G&Ts spent $54.7 million on these secondary, regional facilities.

These investments provide both reliability and economic benefits to members, and the collaborative efforts of Associated and the G&Ts ensure the system remains strong and secure into the future.

Associated and its six owner G&Ts work as a joint registration organization to ensure reliability for members and compliance with NERC requirements. Associated also works with its reliability coordinator, the Tennessee Valley Authority, a key strategic alliance, regulatory bodies and industry groups like SERC Reliability Corp. and the North American Transmission Forum, which is committed to excellence in the reliable operation of the bulk electric system.

As a transmission owner and operator, Associated takes its responsibilities seriously and is a leader in grid security that is supported by a culture of compliance. Its leadership was evident in its second successful Critical Infrastructure Protection audit that resulted in zero findings or violations in April 2016. The cybersecurity audit by SERC covered requirements associated with protecting cyber assets from attack, damage or unauthorized access. SERC auditors recognized the dedication and knowledge of Associated's reliability compliance and cyber compliance security staff, which logged more than 1,800 hours and submitted 2,900 documents for the SERC audit.

Associated is committed to sustaining the reliability and security of the high-voltage transmission system. Working with the six owner G&Ts, it continues to focus attention, resources and actions on the issues most important to bulk power system reliability.

Associated's high-voltage transmission facilities near New Madrid Power Plant take power from the 1,200-megawatt plant to members.

Inset: Journeyman welder/mechanic Roy Shaw works his craft at New Madrid Power Plant .

Safety stays strapped in front seat

Safety remains Associated's No. 1 core value in day-to-day operations and in challenging times, like record coal stockpiles and maintenance outages.

2016 ended up being the cooperative's sixth best safety year with a recordable incident rate of 2.16 per 200,000 hours worked, which is up from its best rate ever of 1.12 in 2014 and 1.68 in 2015.

Employees at New Madrid Power Plant reached a record 1,208 days without a lost-time accident by year-end 2016, while employees achieved milestones of 310 days at Thomas Hill, 369 days at the gas plants and 310 days at the Springfield Headquarters – and are still counting in 2017 at all locations.

Associated continues to work to reduce hazards and protect employees. In 2016 employees reviewed data and updated lockout/tagout software; launched a multifaceted initiative to reduce hand injuries; and developed a human performance initiative to launch in 2017. At Headquarters, changes increased safety and improved the physical security of the facilities.

Mechanized & modernized

machine tuned to operational excellence

It was not just one circumstance or event that made 2016 one of the most challenging years for Associated, just like it was not one thing that enabled the cooperative to turn it around, improve operations and exceed financial plan.

In 2016 Associated capitalized on its strategy of diverse resources, using its natural gas-based fleet to serve member load when gas prices were at 20-year lows.

As a result, net generation from the gas fleet was a record 5.9 million megawatt-hours – 11 percent greater than the 2012 record.

Additional achievements included:

- No lost-time accidents at the gas power plants;
- Chouteau Power Plant II set all-time net generation record of 2.6 million MWh in 2016, which is 44 percent of the gas fleet's net generation for the year;
- Best-in-class starting reliability of 97.65 percent on 1,580 successful unit starts;
- Record 298 consecutive days for having a gas unit on line surpassed 2012 record of 176 days.

Associated continues to rely more on its gas plants to meet member load when natural gas prices are low enough, resulting in increased operations and maintenance on units reaching recommended maintenance milestones.

A major inspection on Chouteau Unit 12, recommended after 100,000 hours of operation, required a 47-day outage. The unit was taken apart, all parts cleaned and inspected, some components refurbished or replaced, and then reassembled to continue serving members.

Maintenance outages also included work on the Chouteau 11 generator rotor; hot-gas-path inspections on Chouteau 21 and the simple-cycle Essex plant; and the first replacement of the catalyst on selective catalytic reduction environmental controls on both units at St. Francis Power Plant, constructed in 1999 and 2001. This was done at a savings through in-house collaboration and management. At St. Francis Power Plant, new controls and upgrades to black-start facilities were constructed to improve reliability.

Strategic alliances, which include fuel supply, vendors and contractors, are key to Associated's success. In 2016, Associated and Siemens signed a revised operations and maintenance agreement on the St. Francis and Chouteau plants that improves operations, performance, review and budgeting of costs to better align the plants' processes with Associated's strategic objectives.

Coal fleet wrestles victories from challenging outages

Due to low natural gas prices, load and market conditions, Associated ran its gas fleet ahead of coal early in the year to serve members. In turn, staff started early or extended planned coal fleet maintenance outages and relied on Associated employees to do the work, reducing overtime and use of contract services – a significant part of the $7.8 million below-budget savings in operations and maintenance.

The longest planned outage in the record books on New Madrid Unit 1 ended mid-July at 135 days. Started early and extended, the outage included work on the generator rotor, upgrading electrostatic precipitators for compliance with particulate matter emissions set by the new mercury rule, and inspections and maintenance on other equipment.

At Thomas Hill Energy Center, due to market forces, all three units operated at reduced load for extended periods. Unit 1 was put in reserve standby in early 2016, allowing for spring maintenance outage work.

In fall 2016, simultaneous outages on Thomas Hill Unit 1, Unit 3 and the rotary car dumper made for a challenging schedule. The Unit 1 outage was not in the 2016 plan but was moved up from 2017 to take advantage of market conditions.

A team of employees at New Madrid Power Plant finished a long-term project in 2016 to create a high-fidelity control room simulator that mimics functionality and response of the units. The simulator allows operators to train and prepare for adverse operating conditions, increasing safety, availability and reliability of the units. In photo, Steve Berry, assistant operations superintendent, conducts an exercise for Edith Partee, assistant control room operator.

Inset: Senior combustion turbine specialist Ryan Mayo, right, assists a contractor installing flashback thermocouples in the combustor at Essex Power Plant.

Focus stays on the road to operational excellence

Challenging outages did not deflect employees' focus on reliability-centered maintenance, which is a critical piece of Associated's operational excellence.

Honing in on heat rate, Associated dropped the weighted average heat rate for the coal fleet by 100 Btu per kilowatt-hour to 9,790 Btu/kWh, saving member-owners about $4 million in fuel per year. Lower heat rates require less coal to generate a kWh, reducing fuel costs and emissions. Thomas Hill Unit 3's heat rate dropped below 9,500 Btu/kWh, which is best in class, during two months in 2016 and averaged 9,613 Btu/kWh for the year. An internal audit of Unit 3's coal pulverizers led to repairs that improved air and coal distribution fineness and dropped moisture levels.

Another example of operational excellence: a best-in-class rate for boiler-tube-failure unavailability in 2016 of 0.63 percent – a steady decline due to a focus on boiler tube failures, a key cause of outages on coal units. The rate was 0.89 in 2015.

Associated is about three years in and about three years from full implementation of its reliability-centered maintenance program. A team from the Electric Power Research Institute was asked to measure Associated's progress. EPRI, which wrote the book on RCM programs, reported Associated is well on its way with a talented team and executive-level sponsorship.

Machine programmed to protect natural resources

Stewardship has always been part of the Associated machine, which prides itself on producing affordable, reliable electricity balanced with protecting the natural resources that our members depend on for their livelihoods and quality of life.

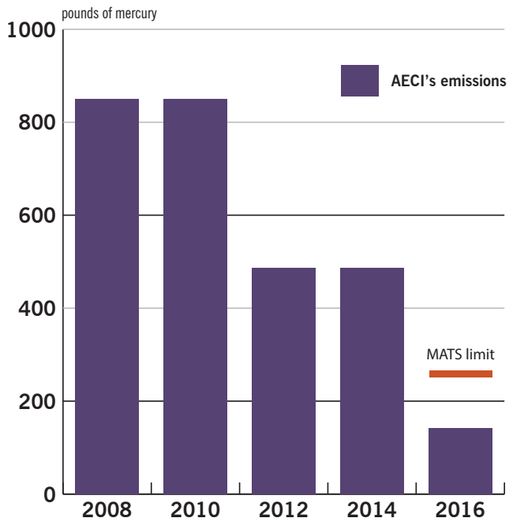
Often, Associated has taken the lead with innovative, cost-effective and proactive solutions. It did the same thing when it came to meeting the Mercury Air Toxics Standards, effective in April 2016 for the cooperative.

Staff started early to craft its compliance plan, and the parts worked together to put Associated's emissions of mercury, particulate and hydrogen chloride well below the new requirements set by the Environmental Protection Agency.

In 2016 Associated finished $35 million in projects and met two important MATS deadlines. First, it was compliant when the rule took effect. It then met the 180-day deadline in October 2016 to demonstrate that compliance, which required submitting scores of testing data and certifications.

Meeting MATS requirements took a concentrated effort from staff throughout the cooperative, particularly by the environmental, health and safety department, laboratory and instrument controls teams at each of the coal plants.

AECI reduces mercury emissions



Overall, Associated has reduced its mercury emissions about 85 percent compared to baseline emissions in 2010, before any refined coal or activated carbon injection emission controls, and is below the MATS requirements today.

AECI started reducing mercury 20 years ago

Associated began reducing mercury emissions long before the Environmental Protection Agency proposed its first mercury rule in 2005.

In 1995, Associated converted all five coal units to low-sulfur coal – one of the first in the country to do so – and reduced sulfur dioxide emissions 90 percent. Lower in mercury and hydrogen chloride too, this coal forms the foundation for Associated's air quality compliance.

In 2011, Associated reduced mercury emissions another 40 percent from its cyclone units when employees led the nation with implementation of refined coal technology. This was added in 2014 on Thomas Hill Unit 3, a pulverized unit, also decreasing its mercury emissions 40 percent. The technology also reduces costs, amounting to fuel savings of $7.8 million in 2016, through contracts for use of refined coal related to a President George W. Bush-era stimulus package.

After MATS was published in 2012, Associated invested in and completed construction of activated carbon injection systems on all five coal units; completed maintenance on three coal units' electrostatic precipitators to improve capture of particulate matter, reducing these emissions to one-half of the MATS standard; and installed sorbent trap monitoring systems on the three largest coal units. However, Associated's smaller Thomas Hill units 1 and 2 are very low-emitting units and only require periodic emissions testing, which reduces costs.

Associated constructed Thomas Hill Lake in 1961 to provide cooling water for the power plant. The lake also provides fishing and other recreational uses for the community, as well as wildlife habitat.

Inset: Senior environmental analyst Kim Dickerson tests one of the new groundwater wells at Thomas Hill.

Carbon certainty eludes utilities

The Obama administration announced its final Clean Power Plan in August 2015, calling for even deeper cuts in carbon emissions from power plants than originally proposed. As expected, the plan was challenged. Reprieve came Feb. 9, 2016, when the U.S. Supreme Court issued an unprecedented stay of the regulation until legal challenges are resolved. Shortly after, on Feb. 13, the death of Supreme Court Justice Antonin Scalia injected more uncertainty into the fate of the Clean Power Plan.

September 2016, the U.S. Court of Appeals for the District of Columbia Circuit heard nearly seven hours of oral arguments but has not yet issued a ruling. The case is expected to end up before the Supreme Court, but with the new administration, cabinet and Supreme Court appointment to come in 2017, uncertainty continues on carbon restraints for power plants.

With all that in mind, Associated's work to comply with the Clean Power Plan slowed in 2016; however, staff participated in state planning meetings.

Synchronized with stewardship

While further improving air quality in 2016, Associated also accomplished a number of projects related to EPA's Coal Combustion Residuals rule that regulates handling of fly ash and bottom ash. EPA's final CCR rule was effective Oct. 19, 2015, and overall is much stricter than the 2010 draft.

Closely tied to the CCR rule is the Clean Water Act Effluent Limitation Guidelines, issued in fall 2015. This further regulates water discharged from power plants, adding monitoring for additional metals and toxics, and includes Thomas Hill units 1 and 2, previously excluded due to their smaller size. Associated will comply with the effluent guidelines between 2018 and 2023, when it renews discharge water permits at the coal plants.

Combined, these two regulations will significantly increase ash-handling costs.

Associated prepared for these regulations and converted both coal plants from wet to dry fly ash handling systems, started development of groundwater monitoring programs and researched options for compliance on its ash ponds.

In 2016 staff completed construction of a second cell at Associated's permitted utility waste landfill near New Madrid Power Plant.

At Thomas Hill Energy Center, coal yard crews removed about 74,000 tons of bottom ash in 2016 from an inactive ash pond, preparing it for closure and doing the work in-house to reduce costs.

Staff met the October 2016 CCR deadline to document the history of ash pond construction and develop closure and post-closure plans for ash ponds and the landfill. All of this information was posted on its public-facing CCR website, as required.

Associated installed additional groundwater wells at both coal plants in 2016. Associated historically has monitored groundwater around its reclaimed mine and at the New Madrid landfill; however, the CCR rule requires more wells and parameters specifically for monitoring around ash ponds and the landfill. Baseline data from the wells will be analyzed in 2017 to determine background concentrations for required parameters.

Environmental stewardship synchronized with innovative 'machine'

Associated staff worked proactively to perform internal audits at the generating facilities to ensure environmental compliance. That performance was reinforced when state environmental agencies conducted random inspections of each coal and gas facility, covering air, land and water regulations, and found no violations. Remaining facilities will be audited in 2017 as part of a continuous effort to ensure compliance across the fleet.

Innovation has led to greener landscapes around Thomas Hill Energy Center. Staff obtained a fertilizer certification and permit exemption that allows land application of wastewater from cleaning the Centac heaters at Thomas Hill Energy Center. Applying the water, which has a nitrogen content, on Associated's agricultural acreage improves the soil and saves on disposal and transportation costs.

Looking to the skies, two peregrine falcon chicks fledged in 2016 from a nest box on the stack of Thomas Hill Unit 3. The box, recently updated to be more welcoming, was placed by employees about nine years ago. Associated has been involved in efforts to restore the once-endangered peregrine falcon population since 2004.

Associated continues to work with a consortium of agencies and organizations focused on restoring populations of monarch butterflies and other pollinators. Working with the Association of Missouri Electric Cooperatives, Associated also informs member-owners of the need for habitat, as well as studies opportunities for creating habitat on Associated-owned land.

Dwarfed by all-time high stockpiles, a dozer climbs up the incline of coal at Thomas Hill Energy Center. Yard equipment operators, mechanics, power marketers and staff throughout the cooperative worked together to manage the inventory of fuel at both coal plants.

Machine tackles mountains of coal

Crawling up shimmering black inclines, 580-horsepower D10 CAT dozers groomed, moved and patrolled all-time high mountains of coal at each power plant in 2016. Coal yard teams maintained safety standards while pushing storage higher and wider and staying within permit levels. In some cases, yard equipment operators ran four dozers 24/7 to accommodate coal deliveries.

It was a testament to the many parts of the Associated machine working together to manage the supply and avoid millions of dollars in penalties it would have incurred for not taking contracted coal deliveries.

Coal yard employees managed stockpiles safely; operations employees ran the units efficiently; power marketing kept the coal units loaded into the market; staff tracked deliveries meticulously and worked with strategic alliances at Peabody and BNSF Railway; and maintenance crews kept dozers and other equipment running well. On Dec. 30, Associated accepted the final load of coal needed to avoid any penalties with a single day to spare.

Conditions contributing to record stockpiles included a large inventory at the beginning of 2016; low natural gas prices; mild temperatures; low energy market prices for selling excess coal energy; less-than-budget member load; extended coal fleet maintenance outages; and unhindered performance by the rail and mine companies.

Machine manufactures member satisfaction

It takes all the parts of the Associated machine and the three-tiered system to produce the product that really matters: member satisfaction.

Member cooperatives in the three-tiered system served by Associated overall rank higher in satisfaction than the national average of nonmember cooperatives, investor-owned or municipal utilities, according to the 2016 results of the member satisfaction survey. Associated has offered a survey every three years since 1989 to member systems. Conducted by TSE Services, the survey includes the American Customer Satisfaction Index, a national gold standard of measurement.

Associated receives overall results for the three-tiered system from the survey, which gathers demographic data and members' views on electricity use, environmental and energy issues. The information helps cooperatives, including Associated, check their roadmaps to ensure they are meeting members' needs.

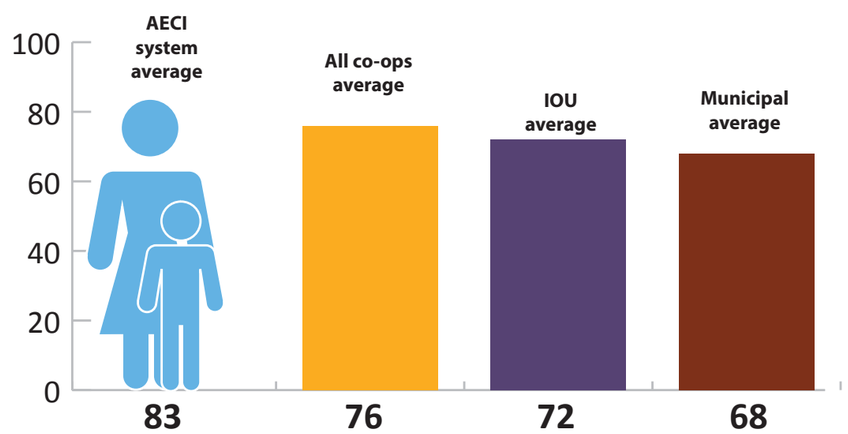
The survey is just one way Associated listens to its member-owners. Its member governance is a noted strength by rating agencies that brings members' voices to the table, and Associated keeps two-way member communication at the top of its strategic objectives year after year.

Yes, the Associated machine is a complex mechanism operating in a highly regulated industry filled with uncertainties and variables, as this report has documented. But, while robots run many machines, people are in control at Associated.

Operators, engineers, mechanics, electricians, technicians, computer experts, planners, accountants, lawyers, power marketers, communicators, dozer operators and many others are turning the cranks and pushing the buttons that run this high-powered machine.

Regardless of craft or position, Associated's leadership and workforce know who owns the machine and they understand its mission. While Associated may add parts to adapt the machine and improve its performance for challenges ahead, it will remain on track and in the lead of serving members.

Member co-ops top customer satisfaction index



In 2016, the American Customer Satisfaction Index collective score for Associated-served systems was 83, compared with the national average of 76 for electric cooperatives. In the three-tiered system, every member cooperative's score was higher than the average score for investor-owned or municipal utilities. Source: ACSI, June 2016

A record number of member-owners and guests attended Associated's 2016 annual meeting, which included a full day of speakers covering the benefits and challenges of distributed energy resources for cooperatives.

Inset: Auxiliary operator Josh Allspach and his family enjoy the safety and employee appreciation day held to celebrate the 50th anniversary of Thomas Hill Unit 1.

Survey says ...

A record 49 of 51 distribution cooperatives took part in the 2016 member satisfaction survey, to which 12,000 residential members responded. All age groups are represented in the survey, which has a confidence level of plus or minus 1 percent. Survey results show affordability and reliability continue to top members' priorities. Among the results:

- Older, middle-income households living in older homes and paying modest monthly electric bills represent the core population.
- Overall, 41 percent of member households have an income of less than $50,000 a year.
- 16 percent of households make less than $25,000 a year.
- 39 percent of members are 65 and older, and 22 percent of that group report incomes of less than $25,000 a year.
- More than half of members have been with their cooperative more than 20 years.
- More than half of respondents had some degree of member identity, which is important. Those who think of themselves as members are more satisfied with their cooperatives. Associated helps member systems on this issue through its Members First materials.
- 40 percent support community solar; however, most said they are not willing to pay more for it. However, each system is different, and two distribution cooperatives have community solar projects. Associated also has seen an increase in residential solar projects and works with member systems to help them inform their members on the costs and benefits of residential solar systems.

Board of directors & executive team

NW Electric Power Cooperative Inc.

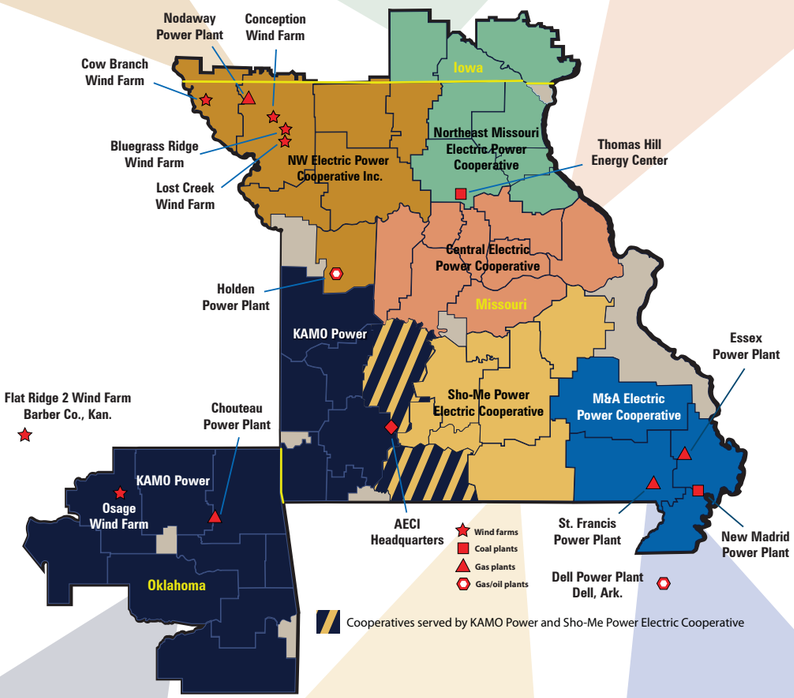
John B. Killgore, vice president, and David L. McDowell

Northeast Missouri Electric Power Cooperative

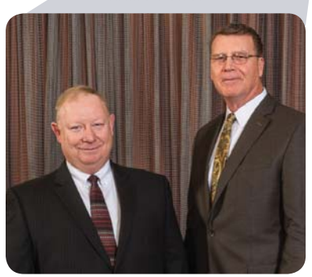
Douglas H. Aeilts and Emery O. Geisendorfer, president

Central Electric Power Cooperative

Christopher M. Turner and Thomas W. Howard

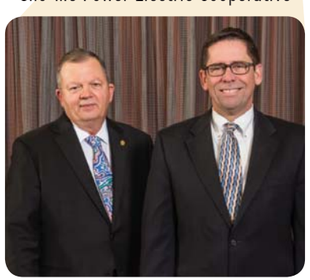


KAMO Power



John E. Hibdon, secretary, and J. Chris Cariker

Sho-Me Power Electric Cooperative



John T. Richards and Dan A. Singletary

M&A Electric Power Cooperative

T.E. "Jake" Fisher, treasurer, and Daryl R. Sorrell

Associated Electric Cooperative's executive team is comprised of, from left, Brian A. Prestwood, vice president, general counsel and chief compliance officer; Roger S. Clark, vice president of Engineering and Operations; Joseph E. Wilkinson, vice president of Member Services and Corporate Communications; Shawn P. Calhoun, vice president of Human Resources; Kenneth S. Wilmot, vice president of Power Production; David W. McNabb, chief financial officer and vice president of Accounting and Finance; Brent W. Bossi, vice president of Information Services; and David J. Tudor, CEO and general manager.

Associated serves six G&Ts operating in three states

Sho-Me Power Electric Cooperative – Marshfield, Missouri
Crawford Electric Cooperative Inc. – Bourbon, Missouri
Gascosage Electric Cooperative – Dixon, Missouri
Howell-Oregon Electric Cooperative Inc. – West Plains, Missouri
Intercounty Electric Cooperative Association – Licking, Missouri
Laclede Electric Cooperative – Lebanon, Missouri
Se-Ma-No Electric Cooperative – Mansfield, Missouri
Southwest Electric Cooperative – Bolivar, Missouri
Webster Electric Cooperative – Marshfield, Missouri
White River Valley Electric Cooperative Inc. – Branson, Missouri

NW Electric Power Cooperative Inc. – Cameron, Missouri
Atchison-Holt Electric Cooperative – Rock Port, Missouri
Farmers' Electric Cooperative Inc. – Chillicothe, Missouri
Grundy Electric Cooperative Inc. – Trenton, Missouri
North Central Missouri Electric Cooperative Inc. – Milan, Missouri
Platte-Clay Electric Cooperative Inc. – Kearney, Missouri
United Electric Cooperative Inc. – Maryville and Savannah, Missouri
West Central Electric Cooperative Inc. – Higginsville, Missouri

Northeast Missouri Electric Power Cooperative – Palmyra, Missouri
Access Energy Cooperative – Mt. Pleasant, Iowa
Chariton Valley Electric Cooperative Inc. – Albia, Iowa
Lewis County Rural Electric Cooperative – Lewistown, Missouri
Macon Electric Cooperative – Macon, Missouri
Missouri Rural Electric Cooperative – Palmyra, Missouri
Ralls County Electric Cooperative – New London, Missouri
Southern Iowa Electric Cooperative Inc. – Bloomfield, Iowa
Tri-County Electric Cooperative Association – Lancaster, Missouri

M&A Electric Power Cooperative – Poplar Bluff, Missouri
Black River Electric Cooperative – Fredericktown, Missouri
Ozark Border Electric Cooperative – Poplar Bluff, Missouri
Pemiscot-Dunklin Electric Cooperative – Hayti, Missouri
SEMO Electric Cooperative – Sikeston, Missouri

KAMO Power – Vinita, Oklahoma
Barry Electric Cooperative – Cassville, Missouri
Barton County Electric Cooperative Inc. – Lamar, Missouri
Central Electric Cooperative – Stillwater, Oklahoma
Cookson Hills Electric Cooperative Inc. – Stigler, Oklahoma
East Central Oklahoma Electric Cooperative Inc.– Okmulgee, Oklahoma
Indian Electric Cooperative Inc. – Cleveland, Oklahoma
Kiamichi Electric Cooperative Inc. – Wilburton, Oklahoma
Lake Region Electric Cooperative Inc. – Hulbert, Oklahoma
New-Mac Electric Cooperative Inc.– Neosho, Missouri
Northeast Oklahoma Electric Cooperative Inc. – Vinita, Oklahoma
Osage Valley Electric Cooperative Association – Butler, Missouri
Ozark Electric Cooperative – Mt. Vernon, Missouri
Ozarks Electric Cooperative Corp. – Fayetteville, Arkansas
Sac Osage Electric Cooperative Inc. – El Dorado Springs, Missouri
Southwest Electric Cooperative – Bolivar, Missouri
Verdigris Valley Electric Cooperative Inc. – Collinsville, Oklahoma
White River Valley Electric Cooperative Inc. – Branson, Missouri

Central Electric Power Cooperative – Jefferson City, Missouri
Boone Electric Cooperative – Columbia, Missouri
Callaway Electric Cooperative – Fulton, Missouri
Central Missouri Electric Cooperative Inc. – Sedalia, Missouri
Co-Mo Electric Cooperative Inc. – Tipton, Missouri
Consolidated Electric Cooperative Inc. – Mexico, Missouri
Cuivre River Electric Cooperative Inc. – Troy, Missouri
Howard Electric Cooperative – Fayette, Missouri
Three Rivers Electric Cooperative – Linn, Missouri

Ten-year statistical summary

Year (calendar-year basis)	2016	2015	2014	2013	2012	2011	2010	2009	2008	2007
Operating revenue (in thousands)	**$1,093,545**	$1,090,790	$1,142,320	$1,129,752	$1,081,899	$1,083,734	$1,055,103	$988,058	$1,084,770	$908,866
Sales (kWh in thousands)	**22,978,917**	22,519,981	22,794,455	24,122,178	23,257,842	23,366,696	23,269,001	22,352,129	23,417,139	23,141,280
Total member sales	**17,879,974**	17,924,012	18,688,056	18,330,147	18,078,911	18,603,536	18,962,284	17,866,111	18,447,072	18,242,620
Central Electric Power Cooperative	**3,636,158**	3,572,374	3,755,050	3,680,320	3,522,610	3,571,431	3,580,599	3,342,947	3,481,427	3,495,591
KAMO Power	**6,351,957**	6,537,387	6,792,200	6,528,534	6,201,160	6,436,559	6,461,680	6,098,183	6,238,584	6,036,320
M&A Electric Power Cooperative	**1,723,722**	1,706,742	1,795,459	1,737,674	1,716,541	1,729,026	1,820,964	1,627,620	1,690,910	1,701,493
Northeast Missouri Electric Power Cooperative	**1,299,942**	1,256,184	1,305,431	1,321,433	1,255,265	1,251,396	1,267,895	1,215,679	1,247,307	1,239,613
NW Electric Power Cooperative Inc.	**1,739,503**	1,730,879	1,774,683	1,780,568	1,778,823	1,869,618	1,911,351	1,705,372	1,692,162	1,673,609
Sho-Me Power Electric Cooperative	**3,128,692**	3,120,446	3,265,233	3,281,618	3,604,512	3,745,506	3,919,795	3,876,310	4,096,682	4,095,994
Total nonmember sales	**5,098,943**	4,595,969	4,106,399	5,792,031	5,178,931	4,763,160	4,306,717	4,486,018	4,970,067	4,898,660
Peak hour member demand (MW)	**4,379**	4,506	4,598	3,905	4,354	4,441	4,495	4,292	4,268	4,248
Member load factor (%)	**46.1**	44.7	45.8	53.1	46.7	47.3	47.6	46.9	51.1	51.0
Member load growth (%)										
Energy	**(0.2)**	(4.1)	2.0	1.4	(2.8)	(1.9)	6.1	(3.2)	1.1	5.2
Demand	**(2.8)**	(2.0)	17.7	(10.3)	(2.0)	(1.2)	4.7	0.6	0.5	2.1
Investment in facilities (original cost in thousands)	**$3,934,751**	$3,852,543	$3,737,915	$3,672,637	$3,610,868	$3,546,039	$3,444,278	$3,100,486	$2,861,374	$2,628,860
Total assets (in thousands)	**$3,047,369**	$2,989,865	$2,956,254	$2,988,262	$2,972,181	$2,971,028	$2,852,098	$2,562,417	$2,267,904	$2,016,853
Long-term debt (in thousands, excluding current maturities)	**$1,858,115**	$1,849,795	$1,812,663	$1,849,113	$1,830,572	$1,810,387	$1,773,982	$1,619,099	$1,334,712	$1,169,701
Total capacity (MW) (see capacity notes, back cover)	**5,700**	5,891	5,827	5,787	5,895	5,895	5,255	5,237	5,237	5,228
Revenue from members (mills per kWh)	**51.57**	51.16	49.94	48.93	49.21	47.51	45.75	45.89	41.16	34.20

Management's discussion and analysis

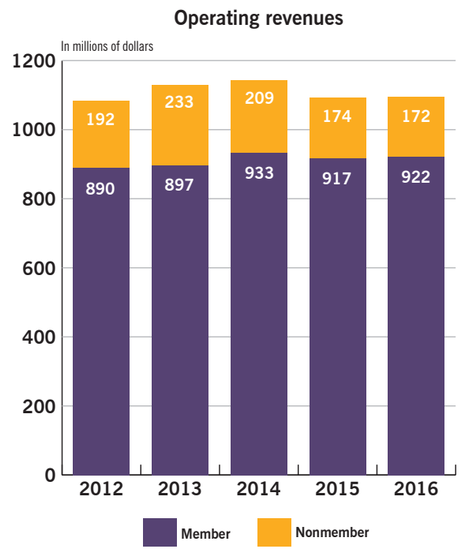
Associated Electric Cooperative Inc. is owned by and provides wholesale power to six regional generation and transmission cooperatives. In turn, these six regional generation and transmission cooperatives are owned by and provide wholesale power to 51 local electric cooperative systems in Missouri, southeast Iowa and northeast Oklahoma. Associated's mission is to provide an economical, reliable power supply and support services to its members.

Associated operates on a not-for-profit cooperative basis. Accordingly, revenues in excess of current period costs in any particular year are designated on the statement of revenues and expenses as "net margin." Member margins (as computed for federal income tax purposes) are credited to patronage capital and assigned to the members on the basis of patronage.

Patronage capital assigned to members is available for refund to the members when authorized by Associated's board of directors and subject to certain restrictions contained in the Amended and Restated Indenture between Associated and Commerce Bank, N.A., dated Oct. 25, 2016. Subject to the indenture and various debt agreements, the board of directors of Associated has the power to self-regulate Associated. Since 1993, Associated's board of directors annually has resolved to retire 2 percent of the prior year-end equity balance. As a result, $187.9 million has been refunded to members since that time.

Associated sells electric power and energy to its members pursuant to the all-requirements wholesale power contracts that extend through 2075. The wholesale power contracts require each member to purchase all its electric power and energy needs from Associated.

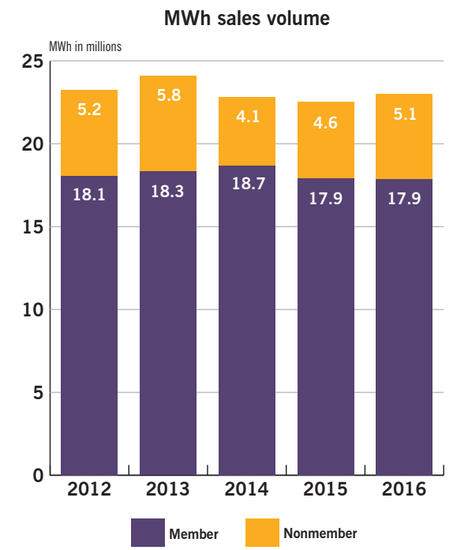
Pursuant to the wholesale power contract, each member is obligated to pay scheduled demand and energy charges designed to cover all of Associated's costs as determined by Associated's board of directors. These rates are the same to each member. At such intervals as it deems appropriate, but not less frequently than once a year, the board of directors of Associated reviews and may revise the rate schedule.

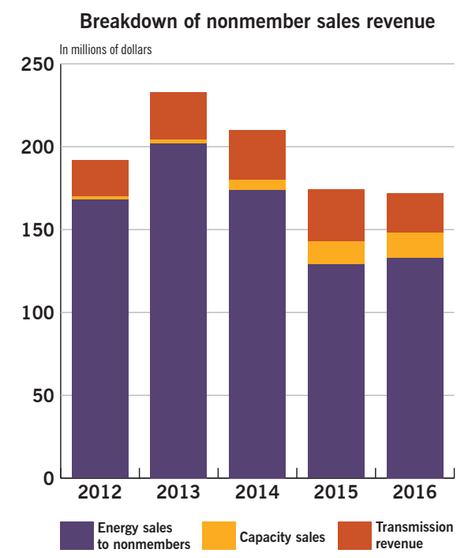


Associated obtains the electric power and energy needed to serve its members from a combination of generation that Associated owns and operates; generation owned by others but operated and/or dispatched by Associated; and purchased power. All units dispatched by Associated are dispatched on an economic basis (that is, units producing the lowest-cost power are dispatched first).

Earnings overview

Net margin for the year ended Dec. 31, 2016, was $42.1 million, an increase of $6.8 million from the prior year.





Operating revenues

Associated's operating revenues are derived from power sales to our member generation and transmission cooperatives (G&Ts) and nonmembers. Nonmember revenue consists of sales of excess energy in the wholesale markets and through structured agreements with other entities, sales of excess generating capacity and transmission sales.

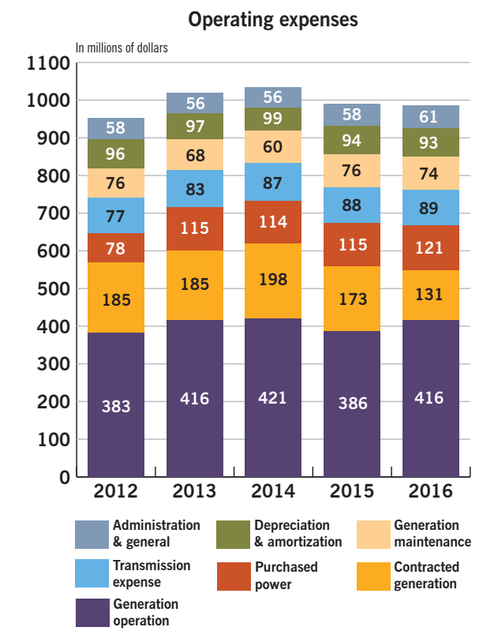
Member revenue increased in 2016 primarily due to a member rate increase effective April 2016 that was partially offset by a decrease of $20 million in recognized deferred revenue. Additionally, member sales volumes decreased slightly due to reduced load requirements as a result of milder weather in 2016 compared to 2015.

Nonmember revenue decreased in 2016. Energy sales to nonmembers increased by $4.2 million due to increased sales volume of excess energy sales in the wholesale market. This increase was more than offset by a decrease in transmission sales of $6.8 million.

The following are some significant factors that affected 2016 net margin as compared with 2015.

Operating expenses

Associated's operating expenses are comprised of energy and demand costs that we incur to generate, purchase and transmit power to meet the needs of our member G&Ts and sales of power to nonmembers. Total operating expenses decreased $2.4 million in 2016 compared to 2015, primarily due to changes in generation operation, contracted generation and purchased power as detailed below.

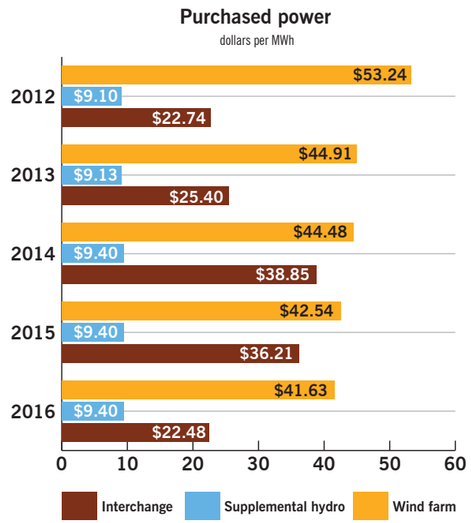


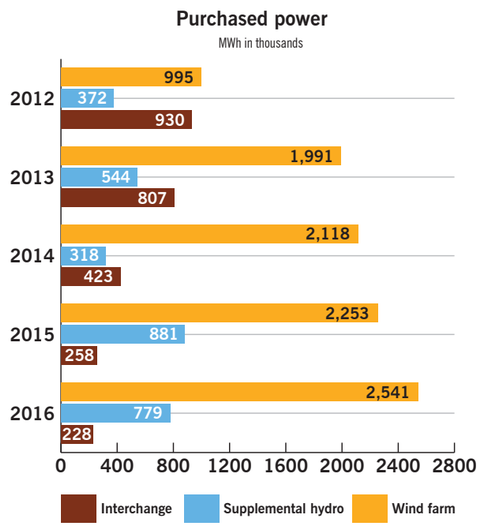
Generation operation expense, which largely

consists of fuel, increased $30.4 million or 7.9 percent compared to 2015. The increase in fuel costs was primarily due to increased generation at Associated-owned generation units, which produced 17,218,777 MWh in 2016 compared with 15,238,148 MWh in 2015. The increase in generation was due to decreased outage time and increased gas generation to support a decrease in contracted generation. The generation mix for these units in 2016 consisted of 65.5 percent coal generation and 34.5 percent natural gas generation.

Contracted generation expense, which consists of a firm capacity hydropower contract with Southwestern Power Administration and a power plant operating agreement with the city of New Madrid, decreased $41.7 million, or 24.1 percent compared to 2015. Contracted generation produced 3,158,597 MWh in 2016 compared to 4,716,044 MWh in 2015. In 2015, contracted generation included GRDA 2 as a resource. The decrease in cost was largely due to lower fuel costs as a result of Associated no longer receiving energy from GRDA 2 beginning Jan. 1, 2016, and decreased generation at New Madrid Unit 1 power plant due to an extended planned outage.

Purchased power expense, which includes energy purchased in the wholesale market and from six wind farms as well as supplemental hydropower, increased $6.2 million, or 5.4 percent, compared to 2015. The increase is primarily due to an increase in wind farm purchase volume of 12.8 percent compared to 2015 due to a full year of wind farm capacity from Osage Wind Farm that began commercial operation in June 2015. This increase was partially offset by a decrease of 11.6 percent in both supplemental hydro and interchange purchases volume as compared to 2015.





Significant balance sheet changes

Associated's balance sheet is a statement of the assets, liabilities and capital at a particular point in time. Significant changes in the balance sheet at Dec. 31, 2016, from Dec. 31, 2015, include:

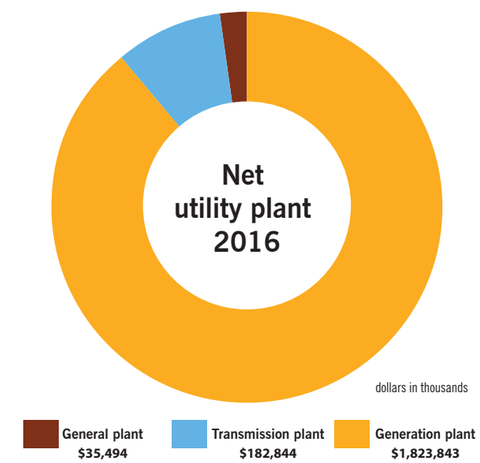
• Utility plant, at original cost, increased $82.2 million. Significant additions during the year included various turbine and boiler projects at the coal plants, activated carbon injection projects at the coal plants, controls upgrade projects at the gas plants and upgrades to the transmission network. Total utility plant, net of accumulated depreciation, at Dec. 31, 2016, was $2.0 billion.

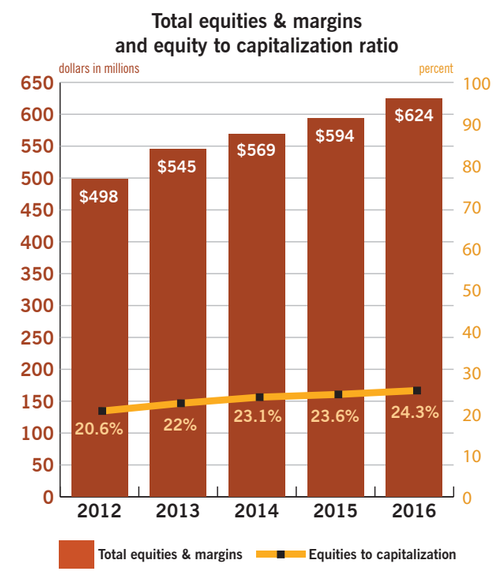
• Member construction advances decreased $17.5 million due to a reimbursement of previously advanced funds.

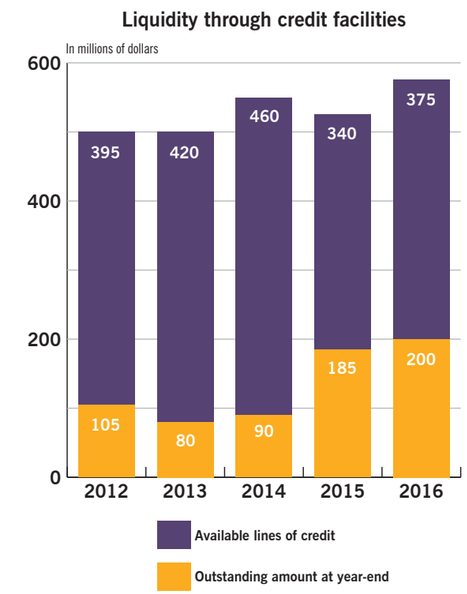
• Other restricted and designated assets and restricted short-term investments increased $38.8 million primarily due to an increase in funds invested in the RUS Cushion of Credit.

• Patronage capital increased $30.2 million as a net result of $42.1 million in net margins for the year and patronage capital retirements of $11.9 million. At Dec. 31, 2016, patronage capital and other equities were 24.3 percent of total capitalization.

• Long-term debt, including current maturities, increased $21.2 million. The increase is due to a $15 million increase in the balance outstanding on lines of credit at the end of 2016 as compared to 2015 and a $71.7 million advance from FFB.







Offsetting the increase were principal payments of $65.9 million. Associated made only three payments to FFB in 2016. The normal fourth-quarter 2016 payment was not due until Jan. 3, 2017. The average interest rate on lines of credit was 1.57 percent in 2016 and 1.22 percent in 2015.

Capital requirements and liquidity

Associated is required, under the terms of its long-term debt agreements, to maintain a minimum margins and equities level of $160 million. As of Dec. 31, 2016, patronage capital and other equities were $624.3 million. Associated maintains substantial liquidity through credit facilities with several lenders. As of Dec. 31, 2016, total credit facilities equaled $575 million, and total available credit under these agreements was $375 million. Please see footnote 12 to the financial statements for additional information regarding long-term debt and liquidity instruments.

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Independent Auditor's Report

Board of Directors and Members
Associated Electric Cooperative, Inc.
Springfield, MO

Report on Financial Statements

We have audited the accompanying financial statements of Associated Electric Cooperative, Inc. (Associated), which comprise the balance sheets as of December 31, 2016 and 2015, and the related statements of revenues and expenses, comprehensive income, patronage capital and other equities, and cash flows for the years then ended, and the related notes to the financial statements.

Management's Responsibility for the Financial Statements

Management is responsible for the preparation and fair presentation of these financial statements in accordance with accounting principles generally accepted in the United States of America; this includes the design, implementation and maintenance of internal control relevant to the preparation and fair presentation of financial statements that are free from material misstatement, whether due to fraud or error.

Auditor's Responsibility

Our responsibility is to express an opinion on these financial statements based on our audits. We conducted our audits in accordance with auditing standards generally accepted in the United States of America and the standards applicable to financial audits contained in *Government Auditing Standards*, issued by the Comptroller General of the United States. Those standards require that we plan and perform the audit to obtain reasonable assurance about whether the financial statements are free from material misstatement.

An audit involves performing procedures to obtain audit evidence about the amounts and disclosures in the financial statements. The procedures selected depend on the auditor's judgment, including the assessment of the risks of material misstatement of the financial statements, whether due to fraud or error. In making those risk assessments, the auditor considers internal control relevant to the entity's preparation and fair presentation of the financial statements in order to design audit procedures that are appropriate in the circumstances, but not for the purpose of expressing an opinion on the effectiveness of the entity's internal control. Accordingly, we express no such opinion. An audit also includes evaluating the appropriateness of accounting policies used and the reasonableness of significant accounting estimates made by management, as well as evaluating the overall presentation of the financial statements.

We believe that the audit evidence we have obtained is sufficient and appropriate to provide a basis for our audit opinion.

Opinion

In our opinion, the financial statements referred to above present fairly, in all material respects, the financial position of Associated as of December 31, 2016 and 2015, and the results of its operations and its cash flows for the years then ended in accordance with accounting principles generally accepted in the United States of America.

Other Reporting Required by *Government Auditing Standards*

In accordance with *Government Auditing Standards*, we have also issued our report dated February 6, 2017, on our consideration of Associated's internal control over financial reporting and our tests of its compliance with certain provisions of laws, regulations, contracts and grant agreements and other matters. The purpose of that report is to describe the scope of our testing of internal control over financial reporting and compliance and the results of that testing, and not to provide an opinion on compliance. That report is an integral part of an audit performed in accordance with *Government Auditing Standards* in considering Associated's internal control over financial reporting and compliance.

BKD, LLP

Oklahoma City, Oklahoma
February 6, 2017

Associated Electric Cooperative, Inc.

Balance Sheets
December 31, 2016 and 2015
(In Thousands of Dollars)

Assets

	2016	2015
Utility plant		
Electric plant in service	$ 3,869,206	$ 3,791,683
Construction work in progress	65,545	60,860
	3,934,751	3,852,543
Less accumulated depreciation	(1,892,570)	(1,789,378)
Total utility plant	2,042,181	2,063,165
Other property and investments		
Member construction advances, net	22,822	40,356
Nonutility property	13,012	13,012
Net investment in direct financing leases	4,128	4,369
Total other property and investments	39,962	57,737
Restricted and designated long-term assets		
Other restricted and designated assets	259,255	220,436
Investments in associated organizations, at cost	25,535	24,541
Total restricted and designated long-term assets	284,790	244,977
Other long-term assets		
Deferred regulatory debits	89,470	77,759
Other deferred assets	83,373	80,828
Total other long-term assets	172,843	158,587
Current assets		
Cash and cash equivalents	98,179	97,554
Restricted short-term investments	99,392	77,309
Accounts receivable	138,847	107,383
Materials and supplies inventory	75,547	75,880
Fuel inventory	68,950	63,114
Other current assets	17,885	18,446
Current portion of deferred regulatory debits	8,793	25,713
Total current assets	507,593	465,399
Total assets	$ 3,047,369	$ 2,989,865

See notes to financial statements.

Associated Electric Cooperative, Inc.

Balance Sheets, continued
December 31, 2016 and 2015
(In Thousands of Dollars)

Capitalization and Liabilities

	2016	2015
Patronage capital and other equities		
Memberships	$ 12	$ 12
Patronage capital	573,114	542,904
Other equities	55,540	55,540
Accumulated other comprehensive loss	(4,377)	(4,706)
Total patronage capital and other equities	624,289	593,750
Long-term debt, excluding current maturities		
Federal Financing Bank	1,242,482	1,223,227
CoBank	433,862	435,745
National Rural Utilities Cooperative Finance Corporation	40,000	43,333
Private placement notes	141,771	147,490
Total long-term debt, excluding current maturities	1,858,115	1,849,795
Other long-term liabilities		
Deferred regulatory credits	164,332	166,118
Other deferred liabilities	37,611	44,157
Asset retirement obligation	43,608	46,648
Accumulated provision for postretirement benefits	26,409	27,450
Total other long-term liabilities	271,960	284,373
Current liabilities		
Accounts payable	134,367	120,771
Current maturities of long-term debt	78,699	65,868
Payable to member cooperatives	31,773	27,960
Other current and accrued liabilities	40,149	41,687
Current portion of asset retirement obligation	7,403	5,661
Current portion of deferred regulatory credits	614	-
Total current liabilities	293,005	261,947
Total capitalization and liabilities	$ 3,047,369	$ 2,989,865

See notes to financial statements.

Associated Electric Cooperative, Inc.

Statements of Revenues and Expenses
Years Ended December 31, 2016 and 2015
(In Thousands of Dollars)

	2016	2015
Operating revenues		
Members	$ 922,007	$ 917,024
Nonmembers	171,538	173,766
Total operating revenues	1,093,545	1,090,790
Operating expenses		
Generation operation	416,193	385,778
Contracted generation	131,413	173,069
Power purchased	121,191	115,011
Depreciation and amortization	93,045	94,033
Transmission	88,635	88,259
Generation maintenance	74,377	75,529
Administrative and general	61,082	57,678
Taxes	5,185	4,663
Accretion of asset retirement obligation	1,255	758
Total operating expenses	992,376	994,779
Operating margin before interest expense	101,169	96,011
Interest on long-term debt	80,433	83,333
Less interest capitalized	(152)	(496)
	80,281	82,837
Operating margin	20,888	13,173
Nonoperating		
Interest and dividend income	20,879	21,601
Other nonoperating income	520	548
Interest expense	(202)	(76)
Total nonoperating	21,197	22,073
Net margin	$ 42,085	$ 35,246

See notes to financial statements.

Associated Electric Cooperative, Inc.

Statements of Comprehensive Income
Years Ended December 31, 2016 and 2015
(In Thousands of Dollars)

	2016	2015
Net margin	$ 42,085	$ 35,246
Other comprehensive income		
Actuarial gain	329	889
Comprehensive income	$ 42,414	$ 36,135

See notes to financial statements.

Associated Electric Cooperative, Inc.

Statements of Patronage Capital and Other Equities

Years Ended December 31, 2016 and 2015

(In Thousands of Dollars)

	Memberships	Patronage Capital	Other Equities	Accumulated Other Comprehensive Loss	Total
Balance at December 31, 2014	$ 12	$ 519,037	$ 55,540	$ (5,595)	$ 568,994
2015 net margin	-	35,246	-	-	35,246
Other comprehensive income	-	-	-	889	889
Patronage capital retirements	-	(11,379)	-	-	(11,379)
Balance at December 31, 2015	12	542,904	55,540	(4,706)	593,750
2016 net margin	-	42,085	-	-	42,085
Other comprehensive income	-	-	-	329	329
Patronage capital retirements	-	(11,875)	-	-	(11,875)
Balance at December 31, 2016	$ 12	$ 573,114	$ 55,540	$ (4,377)	$ 624,289

See notes to financial statements.

Associated Electric Cooperative, Inc.

Statements of Cash Flows

Years Ended December 31, 2016 and 2015

(In Thousands of Dollars)

	2016	2015
Cash flows from operating activities		
Net margin	$ 42,085	$ 35,246
Reconciliation of net margin to net cash provided by operating activities		
Depreciation and amortization	100,002	100,603
Net loss on sale of property, plant, and equipment	203	178
Amortization of loan costs and other	1,155	1,360
Change in deferred regulatory debits	(13,153)	(5,105)
Change in asset retirement obligation	(1,438)	321
Changes in deferred regulatory credits	(3,636)	(24,849)
Changes in current assets and liabilities		
Accounts receivable	(31,443)	9,140
Fuel inventory	(5,836)	(33,290)
Materials and supplies inventory	333	(1,059)
Accounts payable	15,977	9,469
Other current and accrued liabilities	15,361	1,491
Other operating activities, net	(151)	(945)
Net cash provided by operating activities	119,459	92,560
Cash flows from investing activities		
Capital expenditures	(91,242)	(114,895)
Reimbursement of capital expenditures	465	102
Proceeds from sale of property, plant and equipment	46	438
Purchases of available-for-sale investments	(1,648)	(1,466)
Purchases of held-to-maturity investments	(145,880)	(94,148)
Sales of available-for-sale investments	530	536
Sales of held-to-maturity investments	86,344	119,177
Sale and/or maturity of investments in associated organizations, net	2,774	2,662
Member construction advances	(2,036)	(22,112)
Member construction reimbursements	18,416	-
Other investing activities, net	590	626
Net cash used in investing activities	(131,641)	(109,080)
Cash flows from financing activities		
Net investments (withdraws) from member cooperatives	3,813	(23)
Issuance of long-term debt	166,737	157,097
Retirement of long-term debt	(145,868)	(134,325)
Retirement of patronage capital	(11,875)	(11,379)
Net cash provided by financing activities	12,807	11,370
Net change in cash and cash equivalents	625	(5,150)
Cash and cash equivalents, beginning of year	97,554	102,704
Cash and cash equivalents, end of year	$ 98,179	$ 97,554
Supplemental cash flows information		
Cash paid for interest (net of amount capitalized)	$ 66,925	$ 82,976
Supplemental noncash activities		
Change in capital expenditures included in accounts payable	$ (2,380)	$ 2,797

See notes to financial statements.

Note 1: Summary of Significant Accounting Policies

Associated Electric Cooperative Inc. (Associated) is an electric generation and transmission cooperative that provides wholesale service to six members, all of which are generation and transmission cooperatives. Each of the members in turn provides wholesale electric power to their member distribution cooperatives located in Missouri, Iowa and Oklahoma.

Associated maintains its accounting records in accordance with the U.S. Department of Agriculture Rural Utilities Services (RUS) Uniform System of Accounts. The financial statements and the related notes to the financial statements have been prepared on the basis of U.S. generally accepted accounting principles (GAAP).

Utility Plant, Property and Equipment

Utility plant, property and equipment are stated at cost. Generally, ordinary utility plant asset retirements and disposals are charged against accumulated depreciation with no gain or loss recognized. Gains and losses are recorded for retirements of general plant assets and entire asset groups. Maintenance and repairs are charged to expense as incurred. Major inspections, rework and refurbishing are deferred and amortized over five years, which is the period that these costs are recovered in rates (see *Note 10*).

The cost of utility plant is generally depreciated on a straight-line basis over the estimated economic useful lives:

	Estimated Useful Life	Composite Depreciation Rate
Generation plant	32–33 years	3.00%–3.10%
Transmission plant	36 years	3.00%
General plant	5–42 years	2.40%–20.00%

Upon indication of possible impairment, Associated evaluates the recoverability of long-lived assets by comparing the carrying amount of the relevant asset group against the related estimated undiscounted future cash flows expected over the remaining useful life of the asset group. When an evaluation indicates the future undiscounted cash flows are not sufficient to recover the carrying value of the asset group, the carrying value of the asset group is reduced to its estimated fair value. No impairment was recognized in 2016 or 2015.

Associated Electric Cooperative, Inc.
Notes to Financial Statements
December 31, 2016 and 2015
(In Thousands of Dollars)

Asset Retirement Obligations

Associated has asset retirement obligations arising from regulatory requirements to perform asset retirement activities at the time certain property is disposed. A liability is initially measured at fair value and is subsequently adjusted for accretion expense and changes in the amount and timing of the estimated cash flows. The corresponding asset retirement costs are capitalized as part of the carrying amount of the long-lived asset and depreciated over the asset's useful life. Associated's asset retirement obligations include the costs associated with asbestos removal and disposal, reclamation of ash disposal areas, reclamation of landfill sites, removal of fuel oil tanks and removal of certain water lines contained in Associated's generating plants (see *Note 4*).

Capitalized Interest

Interest incurred in connection with the construction of capital assets is capitalized and totaled $152 and $496 in 2016 and 2015, respectively. The average capitalization rates for 2016 and 2015 were 0.606% and 3.152%, respectively, which is based on Associated's cost of financing.

Restricted and Designated Assets

Restricted and designated assets consist of assets segregated for specific purposes, including investments in patronage allocations from various membership cooperatives; funds invested to retire future Federal Financing Bank (FFB) debt and cash funds reserved for the generation, environmental and insurance reserve fund; member revenue subject to refund; and deferred compensation.

Investments

Debt securities, except for those classified as cash equivalents, in which Associated has the intent and ability to hold to maturity are classified as held-to-maturity securities and are reported at amortized cost. All other securities are classified as available-for-sale and are carried at fair value with unrealized gains and losses included as a component of other comprehensive income. Upon sale, these unrealized gains and losses are recognized in net margin. Realized gains and losses are computed based on the difference between amortized costs and proceeds received on a specific security identification basis. Investments with maturities greater than one fiscal year are classified as other restricted and designated assets (see *Note 6*).

Cash and Cash Equivalents

All unrestricted highly liquid investments with an original maturity of three months or less are considered to be cash equivalents and are stated at cost, which approximates market value. At December 31, 2016 and 2015, Associated's cash and cash equivalents balance was $98,179 and $97,554, respectively.

Member Construction

Associated advances funds for the construction of various member primary transmission and generation projects. These advances are subsequently amortized over the life of the asset as transmission or contracted generation expense. The balance of these advances, net of amortization, totaled $22,822 and $40,356 at December 31, 2016 and 2015, with related amortization of $1,155 and $833, respectively. During 2016, Associated was reimbursed $18,416 in previously advanced funds.

Inventories

Inventories of fuel and materials and supplies are valued using the average-cost method. Inventory that is obsolete or excess is written down to its estimated disposal value which approximates net realizable value.

Payable to Member Cooperatives

Associated provides a short-term investment program to its member cooperatives and their cooperative members. The funds invested with Associated earn interest at rates established by Associated. The average rate was 0.45% and 0.15% in 2016 and 2015, respectively. The interest expense is reflected as nonoperating interest expense. At December 31, 2016 and 2015, the members had invested $31,773 and $27,960, respectively, classified as payable to member cooperatives.

Regulatory Matters

Associated is subject to the authoritative accounting guidance applicable to rate-regulated organizations. The Board of Directors has full authority to establish electric rates. Certain items collected in rates have been recorded as regulatory liabilities. These amounts will be recognized as revenue in future periods as costs for which the amounts have been collected are incurred, or when the return of the amounts collected to the members is authorized by the Board of Directors (see *Note 13*). Certain expenses have been recorded as regulatory assets and management believes these amounts are probable of future rate recovery (see *Note 10*).

Revenues

Revenues from the sale of electricity are recorded based on energy delivered to customers and on contracts and scheduled power usages, as appropriate.

Concentration of credit risk with respect to total accounts receivable is due to Associated's customer base. Approximately 65% of accounts receivable at December 31, 2016, is due from Associated's six members and from the City of New Madrid power plant. The credit risk for accounts receivable is controlled through management monitoring procedures.

Associated Electric Cooperative, Inc.
Notes to Financial Statements
December 31, 2016 and 2015
(In Thousands of Dollars)

Contracted Generation

Contracted generation is the expense of generating units for which Associated has energy and capacity contracts in excess of one year (see *Note 5*).

Patronage Capital and Other Equities

In accordance with Associated's bylaws, taxable member margins are allocated to members based on their patronage. For the year ended December 31, 2016, taxable margins of $119,284 were allocated to members. Cumulatively, $1,934,848 has been allocated, and $1,746,900 is unpaid at December 31, 2016. For financial reporting, book net margins are allocated to patronage capital.

Accumulated Other Comprehensive Loss

The following table provides the component of accumulated other comprehensive loss at December 31:

Component	2016	2015
Postretirement benefits actuarial losses	$ (4,377)	$ (4,706)

Estimates

The preparation of financial statements is in conformity with GAAP, which requires management to make estimates and assumptions that affect the reported amounts of assets and liabilities, the disclosure of contingent assets and liabilities and the reported amounts of revenues and expenses during the reporting period. Actual results could differ from those estimates.

Litigation

In the normal course of business, Associated is involved in legal proceedings. In accordance with GAAP, Associated accrues a liability for such matters when it is probable a liability has been incurred and the amount can be reasonably estimated. When only a range of possible loss can be established, the most probable amount in the range is accrued. If no amount within this range is a better estimate than any other amount within the range, the minimum amount in the range is accrued.

Emission Allowances and Renewable Energy Credits

As a result of the operation of its generating resources or wind power purchases, Associated generates or is allocated Sulfur Dioxide (SO_2) and Nitrogen Oxide (NOx) allowances and renewable energy credits (REC) under various environmental regulations. Allowances granted to Associated at no cost do not result in an expense when used. Associated purchases NOx allowances which are recorded in fuel inventory and expensed when used or when they no longer have value. NOx allowance purchases in 2016 and 2015 were $4,114 and $1,166 with related expense incurred of $2,742 and $561, respectively. Proceeds from sales of allowances and RECs in excess of cost and fees are recorded as a gain. During 2016 and 2015, $887 and $1,661, respectively, of proceeds from sale of allowances and RECs were received.

Reclassifications

Certain reclassifications have been made to the 2015 financial statement presentation for the adoption of Accounting Standards Update (ASU) 2015-03, *Interest – Imputation of Interest (Subtopic 835-30): Simplifying the Presentation of Debt Issuance Costs*, that were deemed to be immaterial. These reclassifications had no effect on net margins.

Note 2: New Accounting Pronouncements

Upon issuance of exposure drafts or final pronouncements, Associated reviews new accounting literature to determine the relevance, if any, to its business. The following represents a summary of pronouncements Associated has determined relate to its operations:

Leases

ASU 2016-02 – *Leases (Topic 842)*, was issued in February 2016 and is effective for fiscal years beginning after December 15, 2019. The Financial Accounting Standards Board (FASB) decided on a dual approach for lessee accounting, with lease classification determined in accordance with the principle in existing lease requirements. Under this approach, a lessee would account for most existing capital leases as finance leases and most existing operating leases as operating leases. Both finance and operating leases result in the lessee and lessor recognizing both an asset and liability related to the lease. Management is currently evaluating the impact of this standard.

Associated Electric Cooperative, Inc.
Notes to Financial Statements
December 31, 2016 and 2015
(In Thousands of Dollars)

Revenue from Contracts with Customers

In May 2014, FASB issued guidance to clarify the principles for recognizing revenue. The core principle of the guidance is an entity should recognize revenue to depict the transfer of promised goods or services to customers in an amount that reflects the consideration to which the entity expects to be entitled in exchange for those goods or services. This guidance affects any entity that either enters into contracts with customers to transfer goods or services or enters into contracts for the transfer of nonfinancial assets unless those contracts are within the scope of other standards. An entity should disclose sufficient information to enable users of financial statements to understand the nature, amount, timing and uncertainty of revenue and cash flows arising from contracts with customers. The amended effective date for nonpublic entities is for reporting periods beginning after December 15, 2018. The adoption of this guidance will require additional disclosures, but is not expected to have a material impact on Associated's financial condition or results of operations.

Note 3: Utility Plant

Utility plant, at original cost, at December 31, 2016 and 2015, consisted of the following:

	Generation Plant	Transmission Plant	General Plant	Total
December 31, 2015, ending	$ 3,408,206	$ 308,128	$ 75,349	$ 3,791,683
Additions	58,159	14,242	7,097	79,498
Retirements	(517)	(118)	(989)	(1,624)
Contribution in aid of construction	-	(351)	-	(351)
December 31, 2016, ending	3,465,848	321,901	81,457	3,869,206
Construction work in progress	54,763	5,940	4,842	65,545
Accumulated depreciation	(1,696,768)	(144,997)	(50,805)	(1,892,570)
Total utility plant	$ 1,823,843	$ 182,844	$ 35,494	$ 2,042,181

Depreciation for the year ended December 31, 2016, was $104,771 of which $93,045 was charged to depreciation expense, $4,769 was charged to deferred regulatory debits (see *Note 10*), and $6,957 was included in contracted generation, transmission and generation operation expense. Depreciation for the year ended December 31, 2015, was $106,175 of which $94,033 was charged to depreciation expense, $5,572 was charged to deferred regulatory debits (see *Note 10*), and $6,570 was included in contracted generation and generation operation expense.

Note 4: Asset Retirement Obligations

Associated has accounted for the asset retirement costs associated with certain tangible long-lived assets. Associated has recorded obligations for the removal and disposal of asbestos in Associated's Thomas Hill, New Madrid and Chamois power plants; the reclamation of the landfill site at the New Madrid power plant; reclamation of ash ponds at the New Madrid, Thomas Hill and Chamois facilities; the removal of fuel oil tanks at the Dell and Holden power plants; and the removal of certain water lines contained in Associated's generating plants. Because Associated's business is subject to the accounting requirements for regulated operations, costs incurred upon the adoption of the asset retirement obligation accounting guidance were recorded as a regulatory asset to be recovered in future rates (see *Note 10*). Additionally in 2015, Associated's Board approved the deferral of depreciation and accretion expense associated with coal combustion residual storage facilities that require remediation prior to the end of the plant's assumed useful life (see *Note 10*).

The following is a reconciliation of the beginning and ending aggregate carrying amount of asset retirement obligations:

Carrying Value of Asset Retirement Obligations

	Chamois	Thomas Hill	New Madrid	Holden	Dell	Total
December 31, 2015, ending balance	$ 5,348	$ 14,259	$ 31,674	$ 358	$ 489	$ 52,128
Less current retirement obligations	(3,666)	(397)	(1,597)	-	-	(5,660)
Long-term retirement obligations	1,682	13,862	30,077	358	489	46,468
Current period settlements	(152)	(74)	(292)	-	-	(518)
Accretion expense	174	903	1,230	24	36	2,367
Cash flow revisions	-	(4,662)	1,696	-	-	(2,966)
December 31, 2016, ending balance	5,370	10,426	34,308	382	525	51,011
Less current retirement obligations	(5,370)	(405)	(1,628)	-	-	(7,403)
Long-term retirement obligations	$ -	$ 10,021	$ 32,680	$ 382	$ 525	$ 43,608

Accretion for the years ended December 31, 2016 and 2015, was $2,367 and $2,035 of which $993 and $1,133, respectively, was charged to deferred regulatory debits. The 2016 cash flow revisions are primarily due to reductions in estimated costs for the remediation of asbestos at Thomas Hill and changes in the estimates in costs and timing for the remediation of coal combustion residuals at New Madrid.

Note 5: Contracted Generation

Contracted generation consists of firm capacity received from Associated's hydropower contract and generating units Associated has contracted to dispatch up to a given quantity of power for at least one year, and for which Associated has operating expense responsibility.

Associated Electric Cooperative, Inc.
Notes to Financial Statements
December 31, 2016 and 2015
(In Thousands of Dollars)

Under the terms of an agreement with the City of New Madrid, Missouri (the City), Associated operates the City's power plant. The agreement is effective for 50 years after commercial operation (October 1, 1972). Associated purchases power at cost from the City. In 2016 and 2015, Associated's cost of power purchased from the City was $88,078 and $101,530, respectively. Under the terms of a separate agreement with the City, ownership of the City's power plant will transfer to Associated in 2022 if all scheduled payments are made pursuant to the agreement (see *Note 11*).

Under the terms of an agreement with one of its members, Associated is required to reimburse costs associated with the member's ownership interest in the Grand River Dam Authority (GRDA) Unit 2 coal facility. In 2016 and 2015, Associated's cost related to GRDA Unit 2 was $7,380 and $36,410, respectively. Effective January 1, 2016, Associated's member stopped taking power from GRDA Unit 2 and the member's ownership was terminated in May 2016. Associated will continue to reimburse its member for a deferred loss associated with the termination of this agreement.

Associated has a contract with Southwestern Power Administration (SWPA), effective through April 2031, that entitles Associated to purchase a fixed amount of firm capacity and energy. In 2016 and 2015, Associated's cost of firm power purchased from SWPA was $35,882 and $35,052, respectively.

Note 6: Investments

Investments at December 31, 2016, consisted of the following:

	Available for Sale				Held to Maturity	
	Cost	Unrealized Gains	Unrealized Losses	Fair Value	Amortized Cost	Total
Restricted short-term investments						
RUS cushion of credit	$ -	$ -	$ -	$ -	$ 99,392	$ 99,392
	$ -	$ -	$ -	$ -	$ 99,392	$ 99,392
Other restricted and designated assets						
Mutual funds	$ 6,273	$ -	$ -	$ 6,273	$ -	$ 6,273
Pension reinvestment	6,393	-	-	6,393	-	6,393
RUS cushion of credit	-	-	-	-	238,213	238,213
U.S. government agency securities	-	-	-	-	1,263	1,263
U.S. government treasury bills	-	-	-	-	7,113	7,113
	$ 12,666	$ -	$ -	$ 12,666	$ 246,589	$ 259,255

Investments at December 31, 2015, consisted of the following:

	Available for Sale				Held to Maturity	
	Cost	Unrealized Gains	Unrealized Losses	Fair Value	Amortized Cost	Total
Restricted short-term investments						
RUS cushion of credit	$ -	$ -	$ -	$ -	$ 77,309	$ 77,309
	$ -	$ -	$ -	$ -	$ 77,309	$ 77,309
Other restricted and designated assets						
Mutual funds	$ 5,788	$ -	$ -	$ 5,788	$ -	$ 5,788
Pension reinvestment	5,479	-	-	5,479	-	5,479
RUS cushion of credit	-	-	-	-	200,831	200,831
U.S. government agency securities	-	-	-	-	1,264	1,264
U.S. government treasury bills	-	-	-	-	7,074	7,074
	$ 11,267	$ -	$ -	$ 11,267	$ 209,169	$ 220,436

Associated entered into a cushion of credit agreement with RUS in 2002. At December 31, 2016 and 2015, Associated had on deposit with the U.S. Treasury $337,605 and $278,140, respectively, restricted for future FFB debt service payments. Interest earned is applied to future debt service.

Annual maturities of the investments at December 31, 2016, are classified as follows:

	Available for Sale		Held to Maturity
	Cost	Fair Value	Amortized Cost
Within one year	$ 12,666	$ 12,666	$ 99,392
After one year through five years	-	-	246,589

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Note 7: Nonoperating Income and Other Revenue

As of December 31, 2016 and 2015, interest and dividend income was $20,880 and $21,601, respectively, and consisted of the following:

	2016	2015
Investments	$ 15,186	$ 16,068
Leasing of transmission lines/equipment	1,890	2,001
Patronage capital allocations	3,804	3,532
	$ 20,880	$ 21,601

Note 8: Investments in Associated Organizations

Associated conducts business with various cooperatives including Cooperative Finance Corporation (CFC) and CoBank. As a result of these business relationships, Associated holds membership rights in these organizations, which include the right to receive patronage allocations.

Investments in associated organizations at December 31, 2016 and 2015, consisted of the following:

	2016	2015
CoBank patronage capital equity	$ 17,663	$ 16,829
CFC patronage capital certificates and memberships	3,957	3,823
CFC held-to-maturity securities	3,493	3,626
Other	422	263
	$ 25,535	$ 24,541

At December 31, 2016, future maturities of CFC held-to-maturity securities at amortized cost are as follows: after 1 through 5 years, $1,931; after 5 through 10 years, $666; and after 10 years, $896. The remaining investments in associated organizations do not have a stated maturity.

Note 9: Leases

Net Investment in Direct Financing Leases

Associated's leasing activities consist of the leasing of a transmission line and related equipment. The construction of these facilities was completed in 1992 with all costs incurred by Associated. The transmission line leases expire in 2028. The leases are classified as direct financing leases as follows:

	2016	2015
Total minimum lease payments receivable	$ 7,279	$ 7,906
Less		
Unearned income	(2,524)	(2,910)
Current portion	(627)	(627)
Net investment in direct financing leases	$ 4,128	$ 4,369

Future minimum lease receipts related to direct financing leases for the next five years will be as follows:

2017	$ 627
2018	627
2019	627
2020	627
2021	627
Thereafter	4,144
	$ 7,279

Operating Leases

Associated leases railcars used in the delivery of coal to the New Madrid power plant. Rental expense for these cars was $3,369 and $2,961 for the years ended December 31, 2016 and 2015, respectively. Future minimum lease payments for these cars, are as follows:

2017	$ 2,849
2018	2,780
2019	1,887
2020	1,904
2021	1,904
Thereafter	1,904
	$ 13,228

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Note 10: Deferred Regulatory Debits

Regulatory assets are recorded for expenses that are deferred and will be recovered through rates charged to members in future periods. Such deferrals are made at the discretion of Associated's Board of Directors. Associated does not earn a return on these regulatory assets. At December 31, 2016 and 2015, deferred regulatory debits consisted of the following regulatory assets:

	2016	2015
Loss on hedging activities	$ 26,686	$ 49,793
Maintenance costs	44,777	29,868
Asset retirement obligations	12,817	9,290
Energy efficiency costs	8,212	8,547
Impairment loss on equipment	5,771	5,974
	98,263	103,472
Less current portion of deferred regulatory debits	(8,793)	(25,713)
Long-term deferred regulatory debits	$ 89,470	$ 77,759

Associated's Board of Directors has established a policy to defer unrealized fair value gains and losses associated with hedging activities and recognize in earnings only at the settlement of these instruments. As of December 31, 2016 and 2015, Associated had deferred $26,686 and $49,793, respectively, of unrealized losses on hedging activities (see *Note 17*). The current portion of hedging activities is included as a current asset on the accompanying balance sheets and was $8,793 and $25,713 at December 31, 2016 and 2015, respectively.

Deferred maintenance costs represent the cost of major maintenance and inspection projects that are capitalized in the year incurred. These costs are being amortized and recovered through rates over a period of five years after the project is considered complete.

The costs recognized upon the adoption of the accounting guidance for asset retirement obligations were deferred as a regulatory asset. In 2015, Associated's Board approved the deferral of depreciation and accretion associated with asset retirement obligations related to coal combustion residual storage facilities. These costs are being amortized over the life of the underlying asset.

The costs associated with Associated's energy efficiency initiatives are capitalized. These costs are amortized and recovered through rates over a period of five years.

In 2011, due to changes in projected capacity needs, Associated's Board of Directors elected to market certain generation equipment for sale. This created a triggering event requiring an assessment of these assets for impairment. A loss of $20,062 was recorded for the difference in carrying value as compared to fair value, which Associated's Board of Directors has elected to recover through rates charged to members over 33 years. In December 2013, Associated's Board of Directors elected to accelerate $13,000 of the impairment loss. In 2016 and 2015, scheduled amortization was $203 and $203, respectively.

Note 11: Other Deferred Assets

Other deferred assets are long-term assets that are not otherwise classified as other property and investments or restricted and designated long-term assets.

At December 31, 2016 and 2015, other deferred assets consisted of the following:

	2016	2015
City of New Madrid power plant purchase installment	$ 40,000	$ 35,000
NRECA pension prepayment	18,543	22,252
Long-term receivable on New Madrid substation	8,536	8,671
Preliminary surveys	8,673	8,688
Prepayment of payment in lieu of taxes	4,058	4,535
Other	3,563	1,682
Other deferred assets	$ 83,373	$ 80,828

In both 2016 and 2015, Associated made nonrefundable payments of $5,000 to the City. The payments were made pursuant to an agreement with the City to purchase the City's power plant. If all scheduled payments are made pursuant to the agreement, ownership of the plant will transfer to Associated in 2022. Associated has the right to accelerate the purchase or terminate the agreement at any time during the term.

In February 2013, Associated made a prepayment of $37,087 to the National Rural Electric Cooperative Association (NRECA) Retirement Security Plan (RS Plan)(see *Note 14*). Associated is amortizing this amount over 10 years. The long-term portion of the prepayment is $18,543 as of December 31, 2016.

Associated entered into an agreement to engineer, construct, own, operate and maintain a 345/500 kV 750 MVA transformer at a greenfield site adjacent to the New Madrid Station in which two other parties shared equally in the cost of construction. The total construction cost of the substation was $26,947. One party elected to pay their one-third share of the construction cost in 2014. The other party will pay their share of the construction costs over 20 years. The long-term receivable associated with this project was $8,536 and $8,671 at December 31, 2016 and 2015, respectively.

Associated has engaged engineers to perform preliminary surveys on various projects that could result in capital additions. If a capital addition results from the surveys the costs are included in the capital project costs, otherwise, the survey costs are expensed.

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Associated entered into an agreement to a make a prepayment of $5,729 for a payment in lieu of taxes. The long-term portion of this payment as of December 31, 2016, is $4,058. The prepayment will be amortized into expense from July 2014 through 2026.

Note 12: Long-Term Debt

Long-term debt consists of mortgage notes payable to the United States of America acting through the FFB, CFC and CoBank, as well as others. Substantially all of Associated's assets are pledged as collateral for the borrowings noted in the table below, except those noted as unsecured. The terms of the notes are as follows:

	2016	2015
FFB mortgage notes, due quarterly through 2046 at various rates from 2.18% to 6.96%	$ 1,297,514	$ 1,267,668
Private placement notes, due quarterly through 2041 at rates from 4.65% to 6.39%	147,721	153,282
CoBank term loan, due quarterly through 2029 at 5.88% interest	105,244	109,107
CoBank notes, due quarterly through 2031 at 7.41% average interest	72,919	75,715
CoBank revolving line of credit, due in the year 2020 at average interest rate of 1.57% (unsecured)	200,000	185,000
CoBank notes, due quarterly through 2024 at 6.33% interest	48,659	53,383
CFC notes payable, due annually through 2029 at various rates from 6.60% to 6.65%	43,333	46,667
CoBank Term loan, due quarterly through 2023 at 1.57% average interest (unsecured)	24,975	28,674
	1,940,365	1,919,496
Less unamortized debt issuance costs	(3,551)	(3,833)
Less current maturities	(78,699)	(65,868)
	$ 1,858,115	$ 1,849,795

In 2016, Associated entered into an agreement with RUS through FFB in the amount of $190,836 for a plant construction loan. In 2016, $71,737 was advanced on the plant construction loan, which matures on December 31, 2046, and bears an interest rate of 2.833%. This was the first advance against this loan.

As of December 31, 2016, Associated had $575,000 of committed lines of credit with scheduled expirations of $475,000 in 2020 and $100,000 in 2021. During 2016, a few of the existing lines of credit were amended and expiration dates were extended. As of December 31, 2015, Associated had $525,000 of committed lines of credit. As of December 31, 2016 and 2015, Associated had $200,000 and $185,000, respectively, outstanding on the lines of credit bearing an interest rate of 1.57% and 1.22%, respectively. The interest rate is a variable rate with several reset options. At December 31, 2016 and 2015, unamortized debt issuance costs consisted of the following:

	2016	2015
RUS loans through FFB	$ 2,561	$ 2,549
CoBank loans and line of credit agreements	777	1,053
Private placement notes	213	231
Total unamortized debt issuance costs	$ 3,551	$ 3,833

Annual maturities of long-term debt for the next five years are as follows:

2017	$ 78,699
2018	95,148
2019	82,544
2020	82,284
2021	70,834
Thereafter	1,530,856
	$ 1,940,365

The terms of these debt agreements contain, among other provisions, requirements to maintain a minimum level of total margins and equities, current ratio and margin for interest ratio and other financial ratios. Associated is in compliance with the terms of these agreements.

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Note 13: Deferred Regulatory Credits

Regulatory credits are established for obligations to Associated's members based on actions of Associated's Board of Directors. These amounts will be included in income in the year they are applied to future costs or otherwise returned to members. At December 31, 2016 and 2015, deferred regulatory credits consisted of the following:

	2016	2015
Generation, environmental and insurance reserve fund	$ 157,921	$ 157,921
Member revenue subject to refund	4,561	4,561
1990 Clean Air Act Amendment reserve, net	-	3,636
Deferred gain on hedging activities	2,464	-
	164,946	166,118
Less current portion of deferred regulatory credits	(614)	-
Long-term deferred regulatory credits	$ 164,332	$ 166,118

Associated's Board of Directors established a fund for costs to comply with federal environmental legislation, future generation expenditures, uninsured losses and unplanned power supply cost. This fund is referred to as the generation, environmental, and insurance reserve fund. In 2016 and 2015, there were no additions into this fund and none of the funds previously deferred for this purpose were recognized in the statements of revenues and expenses. In both 2016 and 2015, Associated's Board of Directors designated $5,000 of this fund to be used for the purchase of the City's power plant. Upon purchase, Associated will amortize this amount into income over the depreciable life of the asset (see *Note 11*). Cumulative payments made to the City totaled $40,000 as of December 31, 2016, and are included in other deferred assets (see *Note 11*). Additionally, other restricted and designated assets includes $117,921 of investments that have been segregated until a designated use has been identified by the Board of Directors.

In 2009, a regulatory credit was established as a result of Associated's Board of Directors designating member revenue as subject to future refund in the form of lower rate requirements. In 2016, Associated did not recognize any member revenue subject to refund. In 2015, member revenue subject to refund of $20,000 was recognized as member revenue in the accompanying statements of revenues and expenses. This represents a refund to members in the form of lower rates using revenues deferred in prior years. Total member revenue subject to refund was $4,561 at both December 31, 2016 and 2015.

Associated previously incurred an obligation for future costs to comply with the *1990 Clean Air Act Amendment* (the Act). This deferred regulatory credit was amortized into member revenue in the accompanying statements of revenues and expenses in an amount equal to the amortization of the related costs that have been capitalized to comply with the Act. In 2016 and 2015, amortization was $3,636 and $4,849, respectively. The deferred regulatory credit was fully amortized as of December 31, 2016.

Associated's Board of Directors has established a policy to defer unrealized fair value gains and losses associated with hedging activities and recognize in rates only the current period settlement of these instruments.

Note 14: Pension and Other Postretirement Benefits

Associated participates in the NRECA RS Plan. The legal name of the plan is the NRECA Retirement Security Plan; the employer identification number is 54-0116145 and the RS Plan number is 333. Plan information is available publicly through the annual Form 5500. The RS Plan year is January 1 through December 31. The RS Plan is a defined-benefit pension plan qualified under Section 401 and tax-exempt under Section 501(a) of the Internal Revenue Code. Contributions are required by a collective bargaining agreement which expires on June 30, 2017. Employees hired on or after January 1, 2014, are not eligible to participate in the RS Plan.

In February 2013, Associated elected to make a prepayment of $37,087 to the RS Plan. Associated is amortizing this amount over 10 years. Associated's total contributions to the RS Plan in 2016 and 2015 represented less than 5% of the total contributions made to the RS Plan by all participating employers. Associated's total contribution to the RS Plan was $9,791 and $10,129 in 2016 and 2015, respectively.

For the RS Plan, a "zone status" determination is not required and therefore not determined under the *Pension Protection Act of 2006* (PPA). In addition, the accumulated benefit obligations and plan assets are not determined or allocated separately by an individual employer. In total, the RS Plan was over 80% funded on January 1, 2016 and 2015, based on the PPA funding target and PPA actuarial value of assets on those dates. Because the provisions of PPA do not apply to the RS Plan, funding improvement plans and surcharges are not applicable. Future contribution requirements are determined each year as part of the actuarial valuation of the RS Plan and may change as a result of plan experience.

Substantially all of the employees of Associated participate in the NRECA Select RE Plan 401(k) Plan (the 401(k) Plan). For employees hired before January 1, 2014, Associated contributes amounts not to exceed 2.5% of the employee's full salary for non-represented employees and base pay for International Brotherhood of Electrical Workers members, dependent on the employee's level of participation. For employees hired on or after January 1, 2014, Associated contributes amounts ranging from 6% to 13% depending on the employee's contribution to the 401(k) Plan and years of service. Associated contributed $2,336 and $1,685 to the 401(k) Plan in 2016 and 2015, respectively.

Associated has a deferred compensation plan that permits directors and certain employees to defer a portion of their compensation and accrue earnings on the deferred amounts. The assets of the plan are held in a rabbi trust and are included in other restricted assets and other deferred liabilities.

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Associated provides noncontributory health care benefits to its retired United Mine Workers of America (UMWA) employees and their eligible dependents (UMWA Plan). These employees became eligible for benefits upon reaching age 55 while working for Associated and having 20 years of credited service at retirement. Also eligible were UMWA retirees who had 10 years of credited service and were age 55 or older at termination from Associated. The UMWA Plan is funded as benefit payments are made.

The UMWA Plan qualifies for the federal subsidy for prescription drug coverage under the *Medicare Prescription Drug, Improvement and Modernization Act of 2003*. As such, an assumption regarding the subsidy is included in the actuarial valuation of the UMWA Plan. The effect of the subsidy on the accumulated postretirement benefit obligation as of December 31, 2016, was a decrease of $6,441, which serves to reduce the net periodic cost by $580 annually.

	2016	2015
Change in accumulated benefit obligation		
Accumulated benefit obligation, beginning of year	$ 29,403	$ 31,072
Interest cost	1,157	1,083
Actuarial gain	(194)	(692)
Benefit payments	(2,251)	(2,112)
Medicare subsidy	227	52
Accumulated benefit obligation, end of year	$ 28,342	$ 29,403
Funded status		
Accumulated benefit obligation	$ (28,342)	$ (29,403)
Net liability recognized	$ (28,342)	$ (29,403)
Net periodic benefit cost		
Interest cost	$ 1,157	$ 1,083
Amortization of actuarial loss	135	197
Total net periodic benefit cost	$ 1,292	$ 1,280
Amounts recognized in the accompanying balance sheets consist of		
Other current and accrued liabilities	$ (1,933)	$ (1,953)
Other deferred liabilities	(26,409)	(27,450)
	$ (28,342)	$ (29,403)
Amounts recognized in accumulated other comprehensive loss		
Net actuarial loss	$ 4,377	$ 4,706

	2016	2015
Weighted-average assumptions used to determine benefit obligation at December 31		
Discount rate	3.88%	4.07%
Weighted-average assumptions used to determine net periodic benefit cost for the year ended December 31		
Discount rate	4.07%	3.61%

For measurement purposes, a 4.9% annual rate of increase in medical and prescription cost trend rates was assumed for 2017 and 2018. The annual medical trend rate decreases over time to the ultimate trend rate after 2060 of 3.8%. The annual trend rate for vision expense was assumed to increase 5% per year through 2060. A 1.0% increase in assumed health care cost trend rates would increase total service and interest costs by $122 and increase the postretirement benefit obligation by $3,147. A 1.0% decrease in assumed health care cost trend rates would decrease total service and interest costs by $103 and decrease the postretirement benefit obligation by $2,663.

Associated expects approximately $117 of the actuarial loss to be recognized as a component of net periodic benefit cost in 2017.

Associated contributed $2,251 and $2,112 in 2016 and 2015, respectively, to the postretirement benefit plan. Based on actuarial projections, Associated expects to contribute $1,933 to the postretirement benefit plan in 2017. No discretionary contributions are planned in 2017.

Estimated future benefit payments and subsidy receipts, which reflect expected future service, as appropriate, for each of the next five years and thereafter, are as follows:

	Benefit Payments	Subsidy Receipts
2017	$ 2,327	$ (394)
2018	2,314	(403)
2019	2,299	(408)
2020	2,293	(413)
2021	2,264	(416)
2022–2028	15,117	(2,827)
	$ 26,614	$ (4,861)

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Note 15: Income Taxes

Associated is subject to federal and state income taxes on nonpatronage-sourced taxable income. A detail of the provision for income taxes in 2016 and 2015 is as follows:

	2016		2015	
	Current	Deferred	Current	Deferred
Federal	$ -	$ (31,798)	$ -	$ (31,564)
State	-	(5,198)	-	(5,164)
Change in valuation allowance	-	36,996	-	36,728
Income taxes charged to operations	$ -	$ -	$ -	$ -

Total income tax expense differs from the amounts computed by applying the federal statutory rate to pretax income primarily due to the patronage dividend deduction and changes in the valuation allowance.

Deferred income taxes reflect the net tax effect of temporary differences between the financial statement and tax basis of assets and liabilities. Associated's temporary differences relate primarily to operating loss carryforwards, accelerated depreciation for tax purposes and other reserves deductible for tax purposes only when paid.

The components of the net deferred income tax asset at December 31, 2016 and 2015, are as follows:

	2016	2015
Deferred tax asset		
Net operating loss carryforwards	$ 387,233	$ 346,715
Mine reserves	2,084	1,917
AMT credit carryforwards	2,444	2,589
Postretirement benefits	1,977	1,885
Other	3,685	3,269
Total deferred tax asset	397,423	356,375
Deferred tax liability		
Utility plant	(17,081)	(14,518)
Deferred debits	(4,878)	(3,389)
Total deferred tax liability	(21,959)	(17,907)
Valuation allowance	(375,464)	(338,468)
Net deferred tax liability	$ -	$ -

Associated has federal net operating loss carryforwards for income tax purposes of $1,033,710, which are available to offset future taxable income. If not utilized, these loss carryforwards expire between 2019 and 2036.

Associated also has alternative minimum tax credit carryforwards for income tax purposes of $2,444, which are available to offset future taxes payable. The alternative minimum tax credits do not expire.

A valuation allowance of $375,464 has been established primarily to reflect net operating loss carryforwards estimated to expire before utilization. The valuation allowance increased by $36,996 in 2016.

Associated evaluates and accounts for uncertainty in income taxes in accordance with the authoritative accounting guidance for income taxes. This guidance outlines the requirements for the recognition and measurement of uncertainty in income tax positions. At December 31, 2016 and 2015, Associated did not have any unrecognized tax benefits.

Associated is subject to taxation in the U.S. and various states based on taxable income. As of December 31, 2016, tax years 2013, 2014 and 2015 are subject to examination by the tax authorities. With few exceptions, as of December 31, 2016, Associated is no longer subject to federal and state examinations by tax authorities for years before 2013. There are no ongoing audits at this time.

Note 16: Fair Value Measurements

Fair value is the price that would be received to sell an asset or paid to transfer a liability in an orderly transaction between market participants at the measurement date. Fair value measurements must maximize the use of observable inputs and minimize the use of unobservable inputs. There is a hierarchy of three levels of inputs that may be used to measure fair value. Level 1 inputs include observable inputs, such as unadjusted quoted prices in an active market for identical assets or liabilities. Level 2 inputs are unadjusted quoted prices in an active market for similar assets and liabilities that are either directly or indirectly observable. Level 3 inputs are unobservable inputs for the assets and liabilities for which little or no market data exist, therefore, requiring Associated to develop its own estimates of fair value.

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Associated measures certain assets and liabilities at fair value on a recurring basis. The following table presents information regarding the method of valuation for assets and liabilities as of December 31, 2016:

	Fair Value Measurements	Quoted Prices in Active Markets for Identical Assets or Liabilities (Level 1)	Significant Other Observable Inputs (Level 2)	Unobservable Inputs (Level 3)
Assets				
Long-term investments	$ 12,666	$ 12,666	$ -	$ -
Derivative assets	2,464	-	2,464	-
Liabilities				
Derivative liabilities	21,748	-	21,748	-

The following table presents information regarding the method of valuation for assets and liabilities as of December 31, 2015:

	Fair Value Measurements	Quoted Prices in Active Markets for Identical Assets or Liabilities (Level 1)	Significant Other Observable Inputs (Level 2)	Unobservable Inputs (Level 3)
Assets				
Long-term investments	$ 11,267	$ 11,267	$ -	$ -
Liabilities				
Derivative liabilities	44,674	-	44,674	-

Available-for-sale securities reflected in Level 1 of the valuation hierarchy are measured at fair value each reporting period using quoted market prices on listed exchanges. The derivative instruments reflected in Level 2 of the valuation hierarchy include fixed-to-floating commodity swaps, a heat rate call option and a floating-to-fixed interest rate swap which are valued based on published indexes for the respective contracts. There were no transfers between Level 1 and 2 in 2016 or 2015.

The estimated fair values of Associated's financial instruments are as follows at December 31, 2016 and 2015:

	2016		2015	
	Carrying Amount	Fair Value	Carrying Amount	Fair Value
Long-term investments	$ 12,666	$ 12,666	$ 11,267	$ 11,267
Long-term debt	1,940,365	1,904,565	1,919,496	1,933,104
Derivative assets	2,464	2,464	-	-
Derivative liability	21,748	21,748	44,674	44,674

The method used to estimate the fair value of Associated's long-term debt and investments is based on quoted market prices for the same or similar issues or on the current rates offered to Associated for the debt of the same maturity. The determination of fair value for cushion of credit investments is not practical due to their restriction in use and lack of marketability. Cushion of credit investments yield a 5% fixed interest and are used solely for the payment of FFB debt. The carrying amounts of cash and cash equivalents, accounts receivable and accounts payable approximate fair value at December 31, 2016.

Note 17: Derivative Instruments and Hedging Activities

Associated uses derivative instruments to manage the risks associated with changes in interest rates and the price of diesel fuel used in the operation of its generating resources. Contracts are evaluated under the guidelines of the accounting guidance for derivatives and hedging activities. All contracts that meet the definition of derivative instruments are recorded at fair value as an asset or liability. Fair value is determined based on indexes outlined in the derivative contracts or readily available equivalents.

In November 2007, Associated entered into a floating-to-fixed interest rate swap. Changes in fair value were deferred by action of the Board of Directors as a regulatory item to be recovered through future rates. Only current period settlements of this instrument are included in earnings, which resulted in charges to interest expense of $2,300 and $2,461 in 2016 and 2015, respectively. At December 31, 2016 and 2015, derivative liabilities of $20,240 and $21,998, respectively, were recorded within other current and accrued liabilities and other deferred liabilities. An asset, which represents the amount to be recovered through future rates, is included in deferred regulatory debits (see *Note 10*).

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Associated has entered into a series of swap agreements for diesel fuel that are designed to manage the fuel price risk related to Associated's coal delivery costs through 2018. In 2009, Associated's Board of Directors established a policy to defer changes in fair value as a regulatory item to be recovered through future rates. In 2016 and 2015, current period settlements resulted in a net addition in the cost of delivered coal of $16,636 and $17,151, respectively. At December 31, 2016 and 2015, a derivative liability of $1,508 and $22,433, respectively, was recorded within other current and accrued liabilities and other deferred liabilities. At December 31, 2016, a derivative asset of $1,850 was recorded within other current assets and other deferred assets. The classification of derivative instruments is as follows at December 31, 2016 and 2015:

	2016	2015
Derivative asset	$ 2,464	$ -
Derivative liability	(21,748)	(44,674)
	(19,284)	(44,674)
Less current portion	3,054	20,409
	$ (16,230)	$ (24,265)

Associated has determined all other material electricity-related and commodity purchase contracts qualifying as a derivative also qualify as normal purchases and sales, as defined in the FASB issued authoritative guidance and, therefore, are exempt from the reporting requirements applicable to derivatives and hedging activities.

Note 18: Commitments and Contingencies

Associated has pledged investments, classified as held-to-maturity, for mine reclamation and self-insured workers' compensation purposes. These securities are included in long-term investments. At December 31, 2016 and 2015, these securities amounted to $8,345 and $8,352, respectively.

As of December 31, 2016, Associated has a commitment to purchase all of its coal requirements through 2025 from one coal supplier using an agreed-upon rate calculation mechanism that adjusts with market prices. Associated also has contracts with certain rail companies whose contracts expire in 2020 to deliver this coal at agreed-upon rates.

Associated has a commitment to pay a base transportation fee to the transporters of gas for the Essex and Chouteau power plants through 2021 and 2041, respectively. Associated paid transportation fees of $3,612 and $3,617 in 2016 and 2015, respectively. Associated's commitment to the transporters of gas at the Essex and Chouteau power plants will be $3,612 for 2017 through 2020, and an average of $5,706 annually through 2042.

Associated has commitments to provide power to its member cooperatives through 2075. Likewise, the member cooperatives are committed to purchase all of their power requirements from Associated through the same period. The agreements also provide certain primary and secondary transmission facilities will be made available to Associated. Associated reimburses its members for the costs of these transmission facilities, including depreciation, interest and operations and maintenance. Expenses for these contracts in 2016 and 2015 totaled $66,268 and $63,907, respectively. Additionally, Associated is required to reimburse one of its members for the costs associated with the member's ownership interest in the GRDA Unit 2 coal facility. Expenses related to this agreement were $7,134 and $12,152 for 2016 and 2015, respectively. Associated's member stopped taking power from GRDA Unit 2 in January 2016. Associated will continue to reimburse its member for a deferred loss on the termination of that participation agreement. Projected payments to members for the next five years are:

	Transmission	Generation
2017	$ 67,845	$ 6,787
2018	71,502	6,335
2019	72,608	6,184
2020	73,257	6,032
2021	73,679	5,881

Associated has a commitment to purchase the outputs from six wind farms. Associated does not have fixed cost obligations and pays only for the energy produced. These purchases are set at a contracted price for 20 and 25 years from inception of the contract. Associated purchased wind power at a cost of $105,766 and $95,850 in 2016 and 2015, respectively.

Under the terms of an operating agreement with the City, Associated purchases power at cost from the City's power plant. This agreement is effective for 50 years after commercial operation (October 1, 1972). Under the terms of the 1983 amendment to the operating agreement, Associated also pays a fixed capacity amount. Capacity payments totaled $300 for both 2016 and 2015. Projected capacity payments are $300 annually for the next five years.

Associated has a contract with SWPA, effective through April 2031 that entitles Associated to purchase a fixed amount of firm capacity and energy, plus supplemental energy when available. Capacity payments totaled $25,812 for both 2016 and 2015. Energy payments, including supplemental energy, totaled $17,389 and $17,522 for 2016 and 2015, respectively. Capacity payments for this contract for the next five years are projected to be as follows:

2017	$ 26,027
2018	27,068
2019	28,151
2020	29,277
2021	30,448

Associated Electric Cooperative, Inc.
Notes to Financial Statements
December 31, 2016 and 2015
(In Thousands of Dollars)

Associated, as is common with other electric utilities, is subject to stringent environmental laws, rules and regulations by federal, state and local authorities with regard to air and water quality control, solid and hazardous waste disposal, hazardous material management and toxic substance control. Pursuant to Sections 113 and 114 of the *Clean Air Act*, the U.S. Environmental Protection Agency (EPA) made requests for information to Associated in 2002, 2009 and 2012 regarding the maintenance of its coal-fired electricity generation plants for the purpose of review by the EPA to determine whether Associated has complied with the new emitting source review requirements. Associated has provided responses to those requests. On June 15, 2011, Associated received a Notice of Violation (NOV) under Section 113(a)(1) of the *Clean Air Act*. Associated has provided all requested information to the EPA and the U.S. Department of Justice. Parties have discussed early resolution of the claims set forth in the NOV but to date, none has been reached. These new source review issues are the subject of significant political and litigation activity. At this point in time, it is not possible to estimate what effect, if any, this activity may have on Associated's financial condition. Management believes that it is, and has been, in substantial compliance with all existing laws, rules and regulations.

Note 19: Subsequent Events

Associated evaluates events that occur after the balance sheet date but before the issuance of financial statements to determine if recognition or disclosure of the financial impact of such events is required. There were no events occurring after December 31, 2016, and before February 6, 2017, which is the date the financial statements are available to be issued, that required recognition or disclosure.

In 2016 Associated continued its award-winning reclamation of previously mined land. One of its last parcels, a 26-acre site of a former coal-washing preparation plant near Thomas Hill Energy Center, was released from bond last year after demonstrating more than five years' productivity. Local farmers now lease that parcel for hay production.

Associated has released more than 15,600 acres from bond since 1993, when it closed its mine and converted its units to low-sulfur coal to reduce sulfur dioxide emissions more than 90 percent. The only remaining acreage under bond is used for permitted ash disposal as part of the cooperative's solid waste plan.

Bond releases free up resources for maintaining and improving more than 30,000 acres owned by Associated, including Thomas Hill Lake and surrounding land managed through an agreement with Associated by the Missouri Department of Conservation. Associated continues to partner with agencies to conduct agricultural and wildlife research on its land, which also holds value for future habitat that may offset impacts to new transmission line projects.

Thomas Hill Lake

Associated Electric

... relies on diverse power sources

2016 resources

	MW capacity
Associated's coal-based power plants:	
New Madrid Power Plant*	1,200
Thomas Hill Energy Center	1,153
Associated's combined-cycle, gas-based power plants:	
Chouteau Power Plant	1,062
Dell Power Plant (dual fuel)	580
St. Francis Power Plant	501
Associated's peaking oil- and gas-based power plants:	
Essex Power Plant	107
Holden Power Plant (dual fuel)	321
Nodaway Power Plant	182
Unionville Power Plant (oil)**	45
Additional contracted power sources:	
Hydroelectric peaking power, Southwestern Power Administration	478
Wind energy ***	71
Total	**5,700**

*The city of New Madrid owns the 600-MW Unit 1, which is operated by Associated under terms of an agreement with the city.
**In 2014 Unionville oil-based plant was put in layup status.
***Associated has long-term purchase agreements with six wind farms that total 750 megawatts of nameplate capacity. Staff estimates 71 MW is eligible for peak planning purposes.

Dell Power Plant

1

Associated Electric Cooperative

Coal-based fleet

New Madrid Power Plant – New Madrid, Mo.
Unit 1 – 1972, Unit 2 – 1977
Brown-Boveri turbines, 600 MW each
Coal burn rate 7,150 tons/day per unit

Thomas Hill Energy Center – Clifton Hill, Mo.
Unit 1 – 1966
General Electric turbine, 180 MW
Coal burn rate 2,340 tons/day
Unit 2 – 1969
Westinghouse turbine, 303 MW
Coal burn rate 3,785 tons/day
Unit 3 – 1982
Westinghouse turbine, 670 MW
Coal burn rate 8,480 tons/day

Combined-cycle gas fleet

Chouteau Power Plant – Pryor, Okla.
Chouteau 1 – 2000, two Siemens combined-cycle, gas-based units, 176 MW each; one steam turbine, 170 MW
Chouteau 2 – 2011, two Siemens combined-cycle, gas-based units, 176 MW each; one steam turbine, 188 MW
Plant operated by Siemens.

Dell Power Plant – Dell, Ark.
Units 1 and 2 – 2007 (dual-fuel added in 2011)
Two General Electric combined-cycle, gas-based units, 170 MW each; one steam turbine, 240 MW
Plant operated by EthosEnergy.

St. Francis Power Plant – Glennonville, Mo.
Unit 1 – 1999
Siemens combined-cycle, gas-based unit, 245 MW
Unit 2 – 2001
Siemens combined-cycle, gas-based unit, 256 MW
Plant operated by Siemens.

Peaking generation

Essex Power Plant – Idalia, Mo.
Unit 1 – 1999
Siemens simple-cycle, gas-based unit, 107 MW

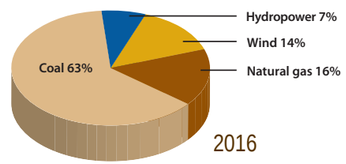
Holden Power Plant – Holden, Mo.
Units 1, 2 and 3 – 2002
Siemens simple-cycle, dual-fuel (gas and oil) units, 107 MW each

Nodaway Power Plant – Maryville, Mo.
Units 1 and 2 – 1999
Siemens simple-cycle, gas-based units, 91 MW each

Unionville Power Plant – Unionville, Mo.
Units 1 and 2, 22.5 MW each, 1977
General Electric, simple-cycle oil units
(Units put in layup status in 2014.)

Diverse resources meet member load

Associated's resources include fuels, renewable hydropower and wind energy, complemented by its Take Control & Save energy efficiency program.



Associated Electric sells and does not retain or retire all of the environmental attributes of energy generated by 750 megawatts of contracted wind facilities. This brings in revenue that helps keep members' electricity affordable.

G&Ts' service areas

NW Electric Power Cooperative Inc.
Cameron, MO 64429
816-632-2121, www.nwepc.com

Northeast Missouri Electric Power Cooperative
Palmyra, MO 63461
573-769-2107, www.northeast-power.coop

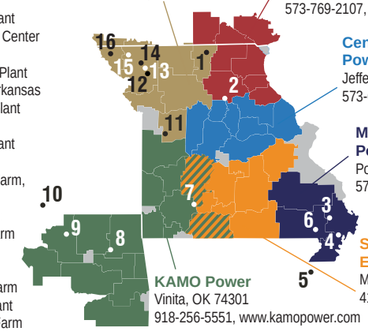
Central Electric Power Cooperative
Jefferson City, MO 65102
573-634-2454, www.cepc.net

M&A Electric Power Cooperative
Poplar Bluff, MO 63902
573-785-9651, www.maelectric.com

Sho-Me Power Electric Cooperative
Marshfield, MO 65706
417-468-2615, www.shomepower.com

KAMO Power
Vinita, OK 74301
918-256-5551, www.kamopower.com

Facilities (clockwise)
1. Unionville Power Plant
2. Thomas Hill Energy Center
3. Essex Power Plant
4. New Madrid Power Plant
5. Dell Power Plant, Arkansas
6. St. Francis Power Plant
7. Headquarters
8. Chouteau Power Plant
9. Osage Wind Farm
10. Flat Ridge 2 Wind Farm, Kansas
11. Holden Power Plant
12. Lost Creek Wind Farm
13. Bluegrass Ridge Wind Farm
14. Conception Wind Farm
15. Nodaway Power Plant
16. Cow Branch Wind Farm



Area served by KAMO Power and Sho-Me Power Electric Cooperative

Diverse power sources

Source	MW capacity
Chouteau Power Plant	1,062
Dell Power Plant	580
Essex Power Plant	107
Holden Power Plant	321
New Madrid Power Plant*	1,200
Nodaway Power Plant	182
St. Francis Power Plant	501
Thomas Hill Energy Center	1,153
Unionville Power Plant**	45
Subtotal	5,151
Contract sources	
SPA hydropower peak	478
Wind energy***	71
Subtotal	549
Total	5,700

**The city of New Madrid owns 600-MW Unit 1, which is operated by Associated.*
***Unionville plant was put in layup status in 2014.*
**** Associated contracts with six wind farms, totaling 750 MW of nameplate capacity. Staff estimates 71 MW as eligible for peak planning purposes.*

2

Associated Electric Cooperative

AECI is owned by and provides clean, affordable, reliable electricity to six regional and 51 local electric cooperative systems in Missouri, southeast Iowa and northeast Oklahoma that serve about 875,000 members.

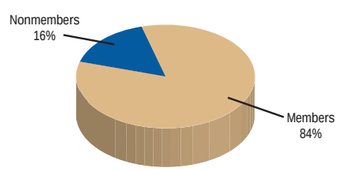
P.O. Box 754 • Springfield, MO 65801-0754
417-881-1204 • fax 417-885-9252 • www.aeci.org

An equal opportunity employer and provider/disability/veteran.

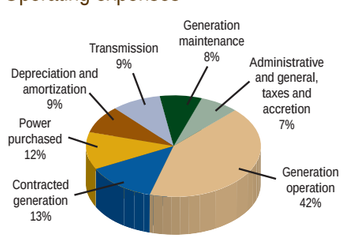
2016 financial highlights

(in thousands)	
Operating revenue	$ 1,093,545
Operating expenses	$ 992,376
Interest expense on long-term debt (less interest capitalized)	$ 80,281
Net nonoperating income	$ 21,197
Net margin	$ 42,085
Investment in facilities	$ 3,934,751
Long-term debt, excluding current maturities	$ 1,858,115
Total assets	$ 3,047,369

Operating revenue



Operating expenses



2016 statistical highlights

Summer peak demand* (8-04-16)	3,955 MW
Winter peak demand* (12-19-16)	4,379 MW

**Peak hour member demand*

Member load factor (percent)	46.1
Revenue from members (mills per kWh)	51.57
Total full-time employees	651
Headquarters	244**
New Madrid Power Plant	179
Thomas Hill Energy Center	228

***Includes staff in various divisions located at power plants*

Associated's and its six G&T owners' integrated, high-voltage transmission system enables Associated to reliably and economically serve member load, as well as transact business with investor-owned and municipal utilities, electric cooperatives, power marketing firms and regional transmission organizations.

Transmission lines owned by AECI and its six G&T owners:

69-kV – 6,852 miles	345-kV – 760 miles
138-kV – 274 miles	500-kV – 46 miles
161-kV – 2,045 miles	**Total – 9,977**

2016 operating statistics

Net generation	19,818,332 MWh
Fuel, operations and maintenance	29.49 mills/kWh

Thomas Hill and New Madrid coal-based plants:

Coal burned	7.8 million tons
Coal units' availability factor (Percentage of time units are available to generate electricity)	78.7 percent
Coal units' unplanned-outage rate	4.4 percent
AECI three-year average	4.5 percent
Industry three-year average for peer group	8.9 percent
Coal units' capacity factor Actual generation as percent of full-load capacity	65.3 percent
Coal units' net heat rate (weighted average)	9,790 Btu/kWh

AECI targets zero injuries. A 2016 recordable incident rate of 2.16 per 200,000 hours worked was its sixth best, compared with record 1.12 in 2014 and 1.68 in 2015. National average for fossil-fueled power plants is 1.8. Employees achieved a record 1,208 days without a lost-time accident at New Madrid, as well as 310 days at Thomas Hill; 369 days at the gas plants; and 310 days at Headquarters at year-end.

Associated Electric Cooperative

David J. Tudor, CEO and general manager

Headquarters 417-881-1204
Accounting and Finance – David W. McNabb
Engineering and Operations – Roger S. Clark
General counsel and chief compliance officer – Brian Prestwood,
Human Resources – Shawn P. Calhoun
Information Services – Brent W. Bossi
Member Services and Corporate Communications – Joseph E. Wilkinson
Power Production – Kenneth S. Wilmot

New Madrid Power Plant 573-643-2211
Roger G. Neumeyer, plant manager
Thomas Hill Energy Center
Stephen E. Iwanowicz, plant manager
Mining Division 660-261-4221
Power Division 660-261-4211

AECI board of directors

Emery O. Geisendorfer, president	Thomas W. Howard
John B. Killgore, vice president	David L. McDowell
John E. Hibdon, secretary	John T. Richards
T. E. "Jake" Fisher, treasurer	Dan A. Singletary
Douglas H. Aeilts	Daryl R. Sorrell
J. Chris Cariker	Christopher M. Turner