

Member Driven. Future Focused.



AMERICAN MUNICIPAL POWER, INC.

SUSTAINABILITY REPORT

2018



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As in years past, American Municipal Power, Inc. (AMP) and its members have remained committed to our stated goals for sustainability.

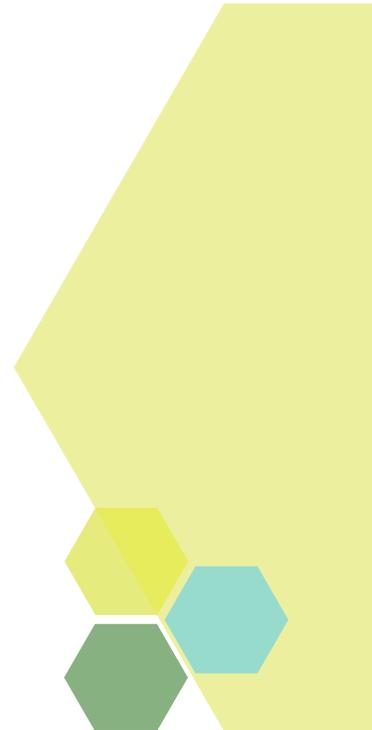
In 2018, the AMP Board of Trustees approved an update to our Sustainability Principles to help AMP and our members align with new regulations and changing market conditions. The AMP Board of Trustees will continue to review the Sustainability Principles to ensure they continue to reflect our values.

These principles were created to guide us as an organization, and we are proud to note that it is through these guiding principles that AMP earned several important recognitions over the past year.

In recognition of exemplary sustainability practices, the City of Columbus awarded AMP with the GreenSpot Light Award in the large business category. Much of this award was credited to AMP's facility improvement efforts, including the installation of an electric vehicle (EV) charging station and the addition of a hybrid-EV to AMP's vehicle fleet.

AMP also received the Encouraging Environmental Excellence (E3) Platinum Award from the Ohio Environmental Protection Agency (Ohio EPA). The E3 Platinum Award is Ohio EPA's most prestigious award recognizing environmental stewardship efforts that improve the social well-being of the local community, region and/or a larger geographic area, resulting in long-term societal benefits.

AMP strives to provide our members with a balanced and sustainable power supply portfolio, as well as to reduce our overall emissions profile. As such, AMP has taken on the Solar Phase II project, working with DG AMP Solar, a wholly-owned subsidiary of NextEra Energy Resources, for the development, construction and operation of up to 80 megawatts (MW) of new solar electric generation facilities, from which AMP will purchase all generation. Over the past year, eight new sites came online within AMP member communities, these include sites in Delaware, Michigan and Ohio.





I would like to note that it is not by accident that you are reading this report electronically. The AMP Board of Trustees voted to produce all annual reports digitally. This is part of AMP's commitment to be a good steward of the environment. Overall, we are proud of our accomplishments and of our members' sustainability efforts.

Marc S. Gerken, PE
AMP President/CEO

Steve Dupee
AMP Board of Trustees Chair
Village Manager of Wellington

Principle

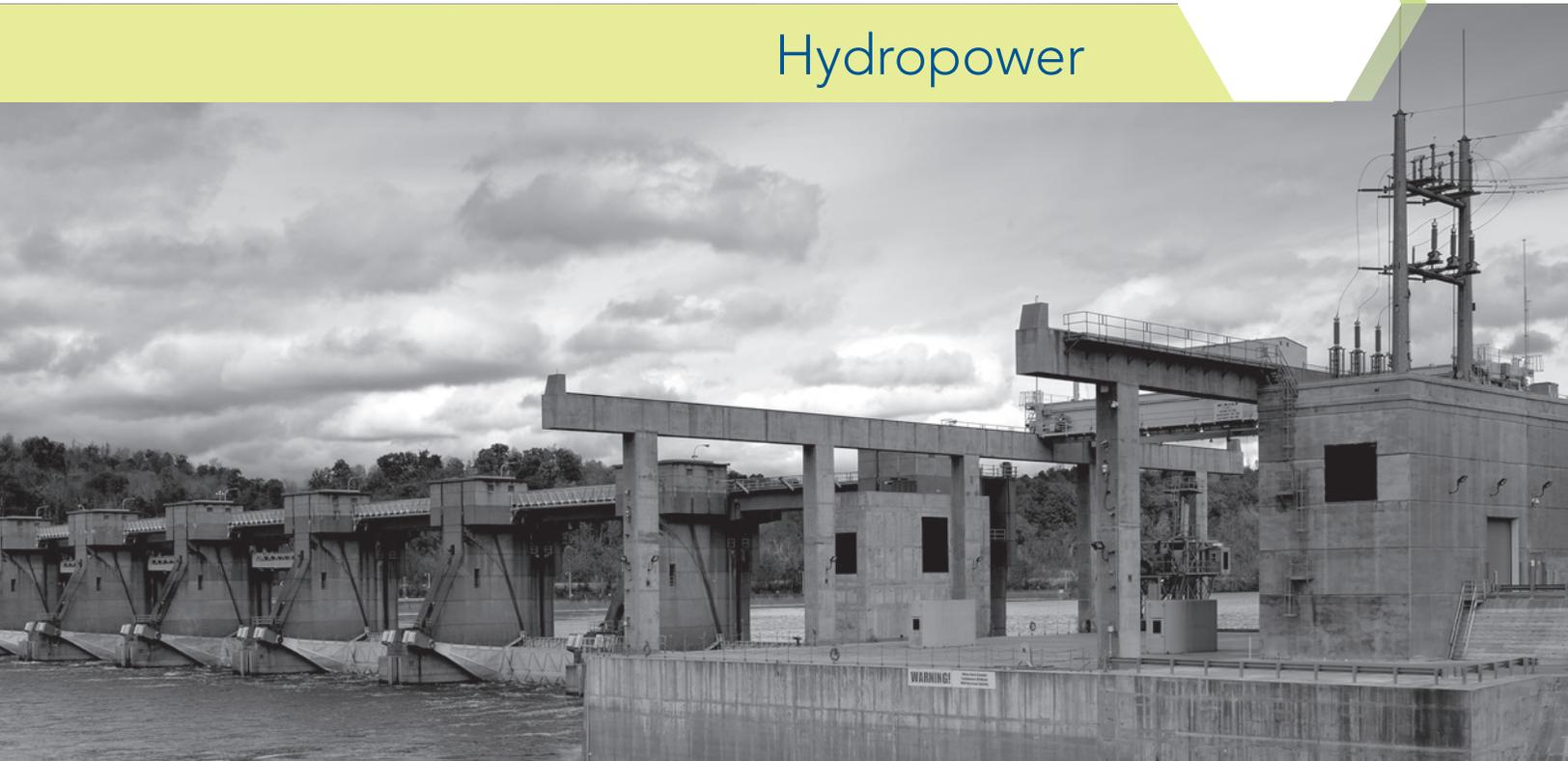
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Providing a balanced and sustainable power supply portfolio

AMP is committed to providing its members with a variety of power supply options to best satisfy their respective preferences, values and needs. This includes maintaining a balanced portfolio of generation projects, power purchase agreements and a potential project development pipeline that includes cost-effective power supply options. In addition, AMP will ensure that energy efficiency, demand response and distributed energy resource (DER) options are available for members to integrate into their portfolios.

AMP maintains a balanced portfolio of generation projects and power purchase agreements, including coal, natural gas, diesel, hydropower, landfill gas, solar and wind. In 2018, AMP's renewable resources made up approximately 18 percent of its members' power supply needs. Visit the "Generation" section of the AMP website for additional information.

Hydropower



AMP owns or operates six hydroelectric power plants operating on the Ohio River. In 2018, those plants generated 1,644,445 MWh of renewable energy. High flow conditions, requiring closure, impacted plants' output.

Solar

Development of new solar continued as part of the AMP Solar Phase II Project, a partnership between AMP and DG AMP Solar, LLC, a subsidiary of NextEra Energy Resources.

A ribbon cutting ceremony was held for the Smyrna Solar Facility in July, celebrating completion of the 1.5 MW project. With the addition of this solar project, the Delaware Municipal Electric Corporation (DEMEC) and its member communities maintain more than 26 MW of solar power, which is more than 50 percent of the state's solar generation.

The Solar Phase II Project has a total of 34.95 MW at 12 solar facilities in AMP member communities that are in commercial operation. The total commissioned in 2018 was 11.5 MW (*see table to the right*).

The Solar Phase II projects have also assisted AMP members in reducing capacity and transmission costs, saving \$1,083,207 and \$1,209,084 respectively in 2018.



Site	COD	Capacity (MW)	MWh
Bowling Green	1/24/2017	20.000	37,842
Marshallville	3/3/2017	0.700	1,056
Prospect	3/3/2017	0.250	402
Front Royal	5/9/2017	2.500	4,305
Orrville #2	1/26/2018	0.950	1,272
Versailles	1/29/2018	1.750	2,675
Haskins	1/29/2018	0.700	1,028
Coldwater	2/1/2018	1.305	1,781
Jackson Center	2/8/2018	1.620	2,514
Orrville #3	3/3/2018	2.250	2,870
Smyrna	7/6/2018	1.170	879
Piqua Staunton	9/1/2018	1.755	657
Total		34.950	57,281

Demand Response

AMP developed a behavioral demand response program for its members titled Community Energy Savings Day. The goal of the program is to assist AMP members in reducing energy use during peak demand days/hours, thereby saving members money on their transmission and capacity costs.

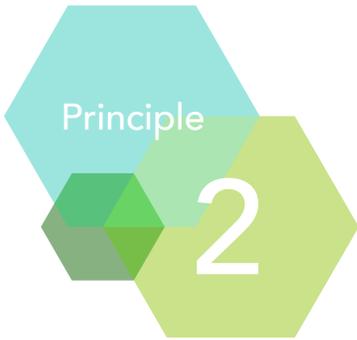
The communication materials that make up the Community Energy Savings Day toolkit encourage customers to reduce energy usage during specified hours of a projected peak demand day.

Program materials include: a video describing the program, sample emails, text and Twitter messages, sample phone scripts, social media graphics and fact sheets.

Peak alert notifications, across all eight transmission zones, were sent out 83 times in 2018 (the average member saw 16 alerts). In addition to educating customers, some of AMP's membership communities also use the notifications to schedule facility water pumps during non-peak times.

In addition, AMP partnered with CPower Energy Management to work with 17 members on enrolling larger commercial/industrial customers in PJM's Capacity Market Demand Response Program, for a total of 75.6 MW and program revenue of approximately \$2.9 million.





Reducing our overall emissions profile

AMP is committed to minimizing pollution, reducing waste and conserving natural resources by designing, constructing, operating and maintaining its facilities in an environmentally sound and responsible manner in compliance with all environmental obligations. AMP also prudently invests in projects to offset GHG emissions from its fossil generation resources.

AMP continues to provide efficient and reliable power while also striving to reduce and mitigate airborne emissions. Some highlights of AMP's efforts to reduce AMP's overall emissions profile include:

Climate Mitigation/Carbon Offset Projects

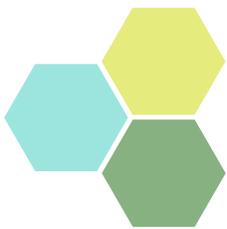
AMP continues to monitor its 467 acres of reforestation projects, conducting site visits in late 2018 and working with S2C Pacific LLC, an energy and environmental consulting firm, to engage various stakeholders on carbon management initiatives. For example, S2C participated on AMP's behalf in the Utility Advisory Committee (UAC), an informal utility-focused coalition housed within the Advanced Energy Economy (AEE). AEE is a trade association representing advanced energy vendors and service providers focused on "using policy advocacy, analysis and education to bring about a prosperous economy based on secure, clean, affordable energy." The UAC engages leaders from utilities and grid operators on issues challenging utilities, advanced energy companies and regulators in a changing electric power system. The UAC consists of 20 member utilities. AMP is one of eight public power entities within UAC.

EcoSmart Choice

The EcoSmart Choice program continued to grow in 2018, adding a new member and nearly 50 customers. Due to more affordable renewable energy certificates (RECs) available in the market, reduced program costs and projected REC values, the AMP Board of Trustees voted on Nov. 16, 2017, to reduce the EcoSmart Choice program price from \$5/MWh to \$3/MWh effective Jan. 1, 2018.

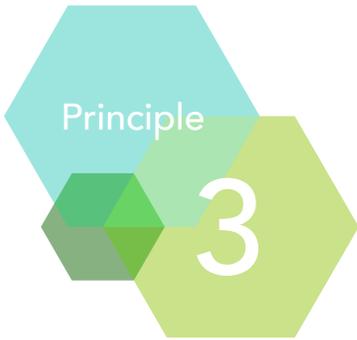
The program is designed to offer a green pricing option for individuals and companies who are interested in purchasing up to 100 percent renewable energy through the purchase of RECs. Participating communities purchased more than 49,186 MWh of green power through the program in 2018, which offset 21,839 tons of carbon dioxide (CO₂) emissions, 15.74 tons of sulfur dioxide (SO₂) emissions and 12.05 tons of nitrogen oxide (NO_x) emissions.





Environmental Compliance

AMP prepared and submitted more than 325 compliance reports and performed more than 200 site inspections of AMP assets, with no violations cited by any regulatory agencies. AMP also optimized environmental monitoring for its diesel peaking fleet, which increased overall unit availability by 81 percent and reduced reportable deviations by 96 percent; deployed an environmental management information system to assist with tracking 517 AMP owned or managed assets (units) across 48 sites to ensure compliant operations; and successfully completed compliance testing of 50 AMP, joint venture and member peaking units with no violations. In addition, AMP received Renewable Energy Certifications for three facilities across three states.



Using less

AMP recognizes the importance of energy efficiency as a strategy for improving system cost effectiveness, customer retention and business development. Reducing electricity demand and usage through innovative conservation efforts and efficiency improvements offered to AMP member communities results in conservation of natural resources and emissions reductions. AMP promotes the “reduce, reuse, recycle” principles of sustainability to its members and employees, and throughout its operations.

AMP provides and facilitates many programs and services to its members in an effort to use less. Major accomplishments in this area throughout the past year are described here.

Efficiency Smart

AMP continues its success with the Vermont Energy Investment Corporation (VEIC) in providing a wide range of energy-efficiency and implementation services for subscribing AMP members through the Efficiency Smart (ES) program. The goal of ES is to encourage residential, commercial and industrial customers to adopt cost-effective energy efficiency services that provide reliable and verifiable cost savings.

In 2018, ES accomplished the following:

- Added four DEMEC member communities as program participants and successfully rolled out program services to those communities.
- Enhanced outreach and technical services to small businesses that produced a nearly 50 percent increase in both customer incentives paid and MWh saved over 2017.
- Piloted a new high bill call service to help residential customers understand likely causes and potential solutions for high energy usage.
- Continued program innovation for 2019 by further emphasizing lighting controls, HVAC, compressed air and other technologies (i.e., to further increase the percentage of non-lighting measures installed).
- Four members have already achieved more than 100 percent of their three-year MWh savings goal (an additional 10 are expected to exceed 100 percent of their three-year savings goal by the end of 2019), while keeping program spending below the budgeted level.

EFFICIENCY\$MART

In 2018, participants conserved 14,066 MWh through the program, which avoided 6,245 tons of CO₂, 4.5 tons of SO₂ and 3.45 tons of NO_x of emissions.*

The cumulative net savings of the program (Jan. 1, 2011 – Dec. 31, 2018) are 218,636 MWh. Net revenue from the sale of Efficiency Smart capacity savings for the delivery year 2017–2018 within the PJM Interconnection region were approximately \$138,560.

Visit www.energysmart.org for more information.

In addition, AMP completed seven U.S. Department of Energy (U.S. DOE) grant-subsidized energy audits through the Direct Connections Program for members with an estimated value of \$126,000.

**Avoided emissions is derived from the amount of energy conserved multiplied by the PJM market power emissions rate.*





Principle

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Assisting member communities

AMP member municipal electric systems are critical components in the success of the communities they serve. Investment of capital – both financial and human – in AMP member communities is essential to ensure a good quality of life and foster economic development and growth. AMP provides ongoing employee training, safety instruction, project engineering and other technical programs to ensure that member communities have access to the most up-to-date information and services in these areas. AMP also collaborates with interested member communities to identify and provide economic development services, energy efficiency opportunities and sustainable development opportunities consistent with local preferences, values and needs. Looking to the future, AMP's member-led Focus Forward Advisory Council strives to inform and prepare members for the evolving electric utility industry.

AMP provides many diverse member training programs and compliance services. More detailed information on how AMP assists members can be found in the separate AMP Annual Report with a few featured items from 2018 below.

Brewster and Bowling Green Receive SEPA Top 10 Awards

The Smart Electric Power Alliance (SEPA) recognized the City of Bowling Green Municipal Utilities and the Village of Brewster Electric Utility for ranking in the Top 10 for annual solar watts-per-customer. SEPA's Top 10 utility rankings are chosen from utilities that participate in SEPA's Annual Utility Market Survey. The 2018 survey covered solar and energy storage, ranking utilities for adding the most megawatts or watts per customer in 2017.

DEED Grant Awarded

AMP's Public Power Electric Vehicle (EV) Toolkit was one of 11 projects selected by the American Public Power Association (APPA) DEED Board of Directors for their spring round of grants. This project is designed to identify opportunities and mitigate challenges faced by AMP's 135 member communities. AMP has partnered with SEPA to develop a public power EV planning toolkit and accompanying guidebook.

These resources will allow members to:

- conduct preliminary economic analyses assessing municipal EV fleet options; and
- identify potential budgetary impacts of increased residential EV adoption.

The toolkit is being developed in Microsoft Excel to ensure widespread compatibility among public power utilities. Default values for key assumptions will be incorporated into the toolkit while also allowing users to tailor assumptions to their specific service territory.





Focus Forward

The Focus Forward Committee aims to educate and inform members about emerging industry trends and to prepare for further integration of distributed energy resources (DER). The Committee convened the Focus Forward Advisory Council (FFAC), which is a group comprised of member-volunteers, rate and engineering consultants, and AMP staff to examine emerging trends, identify the needs of members and develop tools to assist member communities.

The Focus Forward Committee received regular monthly reports on sustainability trends, the renewable energy certificate (REC) market, regulatory developments and AMP sustainability initiatives.

During 2018, the FFAC and its electric vehicle (EV) sub-group met and/or hosted educational webinars in January, March, May, July, August, September and November, where they learned about demand response dynamic pricing and behavioral programs, EVs and how public power utilities are preparing for them, and the value of solar and battery storage. The FFAC developed a list of emerging trends affecting the industry and outlined efforts of improvement for providing information to members.

1. Additional DER resources

AMP assisted seven members with interconnection and rate design inquiries and distributed the *Focus Forward Toolkit: Preparing for a Distributed Resource Future*, and a template interconnection agreement and application. To support AMP's Strategic Plan and help bolster resources to members on how to manage DER and related benefits and risks, AMP requested DER data from members, via a short survey. Responses were received from 31 member communities.

2. Electric vehicles

In response to members' increased interest in EVs, the group compiled *Electric Vehicles: Lessons Learned for Public Power Systems*. The document includes information on EV projections, industry announcements, electrifying fleets, educating customers, hosting or owning charging station infrastructure, and designing rates to manage charging times. In addition, AMP is tracking the status of the Volkswagen settlement funding opportunities for EV charging station infrastructure.

3. Demand Response

As noted earlier, AMP developed a behavioral demand response program for its members titled *Community Energy Savings Day*. The goal of the program is to assist AMP members in reducing energy use during peak demand days/hours, thereby saving members money on their transmission and capacity costs.

4. DER education

In addition to hosting educational webinars, AMP published articles in its weekly publication *Update*, educating members on microgrids, EVs, AMI, solar plus storage, energy storage and grants, and also shared APPA and SEPA news and webinars of interest.



Advanced Metering Infrastructure

Three AMP members participated in the AMP/Hometown Connections Advanced Metering Infrastructure (AMI) program in 2018, with a fourth scheduled to begin deployment in early 2019. Total electric and water meters deployed as of Dec. 31, 2018, were 17,614 and 3,010 respectively.

The Borough of Ephrata was the first to deploy the AMI system, with 6,700 meters. Electric system losses were a key factor in making the business case for Ephrata's system and they continued to see a significant improvement in that area, realizing an annual savings of more than \$571,000. As part of their system, Ephrata is preparing to deploy a customer portal in 2019 that will give customers direct access to their electrical consumption data and allow those customers to better manage their electric usage.

eReliability Tracker

Through the APPA membership, AMP began offering eReliability Tracker service to all AMP members at no cost in late 2015. There are 42 members who now participate in the program, receiving customized annual reports that analyze the utility's outage information for the previous year and compare the data to other subscribers' data in the same region and class size. Subscribers to the service can earn a certificate of excellence and points toward APPA Reliable Public Power (RP3) designation through active participation in the service.



Environmental Services to Members

AMP provided high-quality and cost-effective environmental services to numerous members throughout 2018. These services include preparation of permit applications, compliance monitoring and inspections, report preparation and working with the Ohio EPA on behalf of members.

Technical Training

Throughout the year, AMP offered high-quality training designed to improve member utility employee performance and enhance safety.

- Fifteen lineworker/technical training classes and four regional safety meetings were conducted with a total of 371 attendees from 69 communities in five states (16 percent increase in attendance from 2017).
- Technical Services Conference held for 112 attendees from 28 communities (steady attendance from 2017 to 2018).

Economic Development and Direct Connections

AMP recognizes the importance of business development and retention. AMP offered support to member communities in retaining existing business relationships such as key accounts, as well as attracting new business development.

- Secured seven U.S. DOE grant-subsidized energy assessments, valued at \$126,000 (est.) to key account program members at no additional cost.
- Supported 98 key accounts across 15 members through the Direct Connections Program.
- Distributed over 40 economic development leads and participated in JobsOhio's SiteOhio program and the Utility Partner Task Force on behalf of business development participants.
- Explored ways to augment efforts directed at potential new businesses as well as existing expansion opportunities.

Green Bonds

In 2018, AMP started the process that resulted in \$55.2M in tax-exempt electric prepayment bonds (Green Bonds) sold as part of the financing plan for the Solar Phase II Project in January 2019. The project generated a significant amount of interest in the bond market, as evidenced by the number of high-quality investors who purchased the bonds.

The financing received two green endorsements. The first endorsement came in the form of a favorable Second Party Opinion (SPO) from Sustainalytics, Inc., a Toronto-based independent environmental, social and corporate governance research, rating and analytics firm. The second came in the form of the highest Green Bond Assessment (GBA) that can be issued by Moody's. Moody's issued a GB1, or Excellent, rating after reviewing the project assessment criteria submitted by AMP.





Reaching out to stakeholders

AMP engages with stakeholder entities – including (but not limited to) government, business, academia, media and utility organizations – in an effort to ensure that they understand the purpose, role and value of public power, along with AMP’s mission and vision. AMP leverages this outreach to promote AMP and member interests. AMP encourages member communities to identify potential partnership opportunities as well.

AMP continues to foster existing relationships with stakeholders, as well as developing new ones. Several examples of how this was accomplished in 2018 are highlighted below.

Legislative/Regulatory

AMP/OMEA tracked key regulations and provided updates to members as appropriate regarding activities by the Federal Energy Regulatory Commission (FERC), PJM, Midcontinent Independent System Operator, Inc. (MISO), U.S. EPA and Ohio EPA, among others.

AMP/OMEA submitted technical comments on behalf of members to:

- the U.S. EPA regarding the Affordable Clean Energy (ACE) Rule (intended to replace the Clean Power Plan (CPP)), the Cross State Air Pollution Rule and repeal of the CPP;
- FERC regarding the PJM capacity construct, transmission rights, market pricing, supplemental transmission projects and energy efficiency resources aggregation; and
- Ohio EPA regarding the Volkswagen settlement beneficiary mitigation plan.

Ohio River Sweep

AMP’s hydroelectric projects were sponsors of the Ohio River Sweep, where thousands of volunteers cleaned up 320 tons of trash from approximately 3,000 miles of shoreline at 175 cleanup sites in six states, from Pittsburgh, Pa. to Cairo, Ill. The award-winning event, hosted by the Ohio River Valley Water Sanitation Commission, has been working to clean up the Ohio River since 1989.

National Federation of Municipal Analysts

The National Federation of Municipal Analysts hosted an *Advanced Seminar on the Impact of Environmental, Social and Governance (ESG) and Resiliency Issues on Credit Analysis* in Boston on Oct. 11 and 12. Marc Gerken, AMP President/CEO, participated in a panel discussion on financing sustainable energy in today’s market. Gerken’s remarks largely covered AMP’s focus on industry disruptors and what may be expected in the next 10 years — a rapidly changing grid and an evolving and engaged customer.



2018 AMP/OMEA CONFERENCE



2018 AMP/OMEA Annual Conference

More than 300 participants took part in the 2018 AMP/Ohio Municipal Electric Association (OMEA) Annual Conference, held in Cleveland, Sept. 24-27.

During the conference, participants were able to attend panel discussions and presentations regarding energy market trends including the value of local generation, an overview of electric vehicle technologies and charging infrastructure, new technologies disrupting the electric utility industry and a discussion on how industries across the globe are using drones.



Advanced Energy Economy

As part of its Utility Advisory Committee involvement, AMP organized and hosted a webinar for Advanced Energy Economy (AEE) broader membership, titled, *Doing Business with Public Power*, Jolene Thompson, AMP Executive Vice President of Member Services and External Affairs, presented. The objective was to educate AEE member companies about the critical role public power systems play in the U.S. electricity sector, as well as share strategies for doing business with public power. A key focus was explaining the many differences between investor-owned utilities and public power entities related to business models, governance, regulation, technology deployment and more.

Principle

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Leading by example

AMP encourages its officers and employees to lead by example through increased efforts to recycle and conserve energy, both at home and in the workplace. To the extent practicable, AMP uses its headquarters to demonstrate the use of green building principles, distributed energy resources and energy efficient technologies, thus leading by example. AMP assists members as they pursue innovations in the rapidly changing electric utility industry, increase environmental stewardship and meet customer needs. Through AMP's internal Innovation Team and industry group memberships, AMP strives to be informed and engaged as power sector technological advances and trends progress. AMP reports its sustainability and environmental stewardship actions on both a quarterly and an annual basis and, where possible, measures its success in achieving the goals laid out by these Sustainability Principles.

Striving to be public power's leader in wholesale energy supply and value-added member services, as declared in the AMP vision statement, carries with it the responsibility to help set the standard for sustainability. Key efforts of AMP-specific sustainability for the year include:

AMP DNA Award

Kyle Weygandt was recognized as the AMP 2018 DNA Award recipient. Weygandt is the director of member safety with AMP's technical services department and has been with the organization since 2006.

AMP's CEO initiated the annual award to recognize an employee who advances AMP's vision and mission. The DNA Award recipient exemplifies AMP's core values: cooperation, integrity, innovation, action oriented, effective communication and member focused.



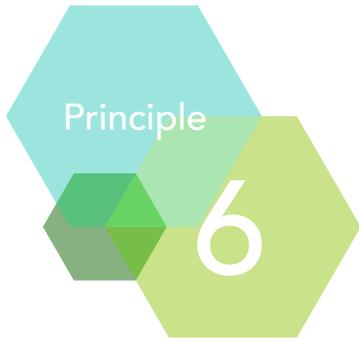


Ohio EPA presents the AMP Board of Trustees with the E3 Platinum Award. From left to right: Steve Dupee, AMP Board of Trustees chair and Wellington village manager, Craig Butler, former Ohio EPA director, and Marc Gerken, P.E., AMP president and CEO.

AMP Innovation Team

In April, AMP convened an Innovation Team (I-Team) to research emerging technologies and identify potential impacts to the industry, AMP and its members. The I-Team identified the following trend and technology disruptors and are in the process of developing strategic roadmaps in response.

- Decarbonization – economics and societal changes driving toward a cleaner grid
- Democratization – the prosumer; community and social driven; constant connection and communication
- Electrification – electric vehicles/transportation; infrastructure
- Digitalization – the cloud, the internet of things and two-way energy accounting
- Decentralization – multi-directional network of electron flows



Continued

AMP sustainability initiatives and awards

In January, AMP completed the installation of an EV charging station (CT4000 ChargePoint) and new sub-panel at its headquarters location. Each of the two Level 2 charging ports supply up to 7.2 kW. The charging station is free for use by members, building tenants, employees and visitors. The organization celebrated the installation of the station with an EV ride and drive event held in partnership with Smart Columbus. The Ride and Drive Roadshow allowed AMP Board of Trustees members and AMP staff to test drive some of the newest electric vehicles on the market. Additionally in 2018, AMP purchased a hybrid plug-in vehicle for its fleet.

AMP also upgraded lighting throughout its headquarters building from T-12 to T-8, increasing energy efficiency.

AMP received the 2018 GreenSpotLight Award from the City of Columbus in recognition of exemplary sustainability practices by a large business. The award follows the completion of several efficiency projects undertaken by AMP, as well as continued sustainability practices throughout the organization. GreenSpot is a membership-based program in Columbus that provides a framework to think about sustainability, as well as a way to log successes.

AMP staff recycled approximately 1,200 pounds of electronic waste and between 500-600 pounds of paper during a recycling drive for personal materials held at AMP headquarters on April 20. Materials were collected by Iron Mountain and Accurate IT Recycling Services.

AMP was presented with the Encouraging Environmental Excellence (E3) Platinum Award by former Ohio EPA Director Craig Butler during the November AMP Board of Trustees meeting. The E3 Platinum Award is Ohio EPA's most prestigious award, which recognizes environmental stewardship efforts that improve the social well-being of local community, region and/or a larger geographic area, resulting in long-term societal benefits.

Prairie State Generating Company announced plans to aid monarch butterfly population growth. Milkweed, a necessary plant for monarch butterflies, has been planted in multiple areas across the energy campus, and plans for additional plantings are underway.





Staff giving/charitable

In 2018, AMP employees contributed a total of \$25,129 through the payroll deduction program to 15 different charities chosen by employees.

AMP staff kicked off 2018 by volunteering their time at the Mid-Ohio Foodbank for several days in January, helping to inspect, sort and repackage various donated items. Altogether, volunteers processed nearly 17,000 pounds of product.

In February, staff contributed \$530 to the American Cancer Society through the company's First Annual Charity Chili Cook-off.

For the fifth-straight year, Prairie State Generating Company (PSGC) employees took part in the annual Souper Bowl program. PSGC starts the food drive every year on the Monday following the Super Bowl by collecting nonperishable food items and cash donations to support the Combating Hunger on Weekends (CHOW) program at the Okawville Grade School and the Marissa Food Pantry. The Marissa Food Pantry serves the food needs in and around Marissa, Ill. In 2018, PSGC's donations totaled more than \$1,800.

Two blood drive events were held at AMP headquarters, in May and November, to benefit the American Red Cross.

November 26 through Dec. 14 marked AMP's Annual Holiday Giving program. Collections were received at AMP headquarters and at the AMP generating facilities. Headquarters staff donated 130 pounds of non-perishable food products to the Mid-Ohio Food Bank, along with cash donations of \$1,255. The cash contributions to the food bank were matched by other sponsors, bringing total contributions to \$2,510. Staff also donated approximately 250 pounds of clothes, infant and personal hygiene items and toiletries to the Columbus Community Shelter Board.

Staff at the Willow Island and Belleville hydroelectric plants donated 50 pounds of food to the Old Man Rivers Mission in Parkersburg, W. Va., and staff at the AMP Fremont Energy Center worked with the Marine Corps Reserve to support Toys for Tots, filling a large, five-foot bin with new toys.

Awards to Member Communities

Safety Commendations for Transmission and Distribution were given to:

- Bryan Municipal Utilities
- Dover Light & Power
- Napoleon Power & Light
- Wadsworth Electric Department

In the transmission/distribution category, safety awards were presented to:

- Berlin (Md.) Electric Utility Department
- Cuyahoga Falls Electric System
- Borough of Ephrata Electric Division
- Village of Genoa Municipal Utilities Department
- Haskins Electric
- Village of Minster Electric Department
- Newton Falls Electric Division
- Orrville Utilities
- St. Clairsville Light & Power
- Wapakoneta Electric Department
- Westerville Electric Division
- Yellow Springs Department of Public Works

Safety Commendations were given to:

- Bryan Municipal Utilities for transmission and distribution
- Dover Light & Power for transmission and distribution
- Napoleon Power & Light for transmission and distribution
- Wadsworth Electric Department for transmission and distribution

Mutual Aid Commendations were given to:

- Arcanum Water and Light for providing assistance to the City of Celina
- Bowling Green Municipal Utilities for providing assistance to the Village of Arcadia and Con Ed
- Bryan Municipal Utilities for providing assistance to Con Ed
- Celina Municipal Utilities for providing assistance to Con Ed
- Coldwater Board of Public Affairs for providing assistance to Con Ed
- Deshler Municipal Electric for providing assistance to the Village of Arcadia
- Hamilton Department of Electric for providing assistance to the City of Celina
- Jackson Center Municipal Electric System for providing assistance to Con Ed
- City of Marshall Electric Department for providing assistance to Con Ed
- Minster Electric Department for providing assistance to the City of Celina
- Napoleon Light & Power for providing assistance to Con Ed
- Village of New Bremen Utilities for providing assistance to the City of Celina
- Piqua Power System for providing assistance to Dayton Power & Light, the City of Celina and Con Ed
- Plymouth Municipal Electric for providing assistance to the Village of Shiloh
- City of St. Marys Municipal Electric System for providing assistance to the City of Celina
- Shelby Division of Electric and Telecommunications for providing assistance to the Village of Shiloh
- Tipp City Municipal Utilities for providing assistance to Con Ed
- Wapakoneta Electric Department for providing assistance to the City of Celina
- Westerville Electric Division for providing assistance to Con Ed



Finance Awards

- Highest Credit Score population more than 5,000 – the City of Westerville with a score of 100 percent.
- Highest Credit Score population less than 5,000 – the Village of Holiday City with a score of 94 percent.
- Most Improved Credit Score – the City of Hubbard with a 48 percent improvement.
- Financing of the Year population of more than 5,000 – the City of Wapakoneta for two new substations, upgraded metering and a transmission line project.
- Financing of the Year population of less than 5,000 – the City of Philippi for upgrades to their main substation and distribution system, system repairs and vehicle purchases.

Innovation Awards

- Borough of Berlin for the Berlin Interactive Distributed Generation project.
- Borough of Ephrata for the Solar Project Funding of Economic Development.

Public Power Promotion Awards

- City of Cleveland for the CPP Intern to Apprentice Program.
- City of Cuyahoga Falls for the 2018 Tree Power project.
- City of Dover for the Public Power Week event.
- City of Hamilton for the Customer Payment Portal project.

Systems Improvement Awards

- City of Cleveland for the Lake Road Substation expansion.
- City of Dover for the 69 kilovolt West Circuit project.
- Village of Pioneer for the Circuit 20 Line Relocation project.
- Village of Wellington for the Erie Street Substation project.

Electric System Sustainability Awards

- City of Cleveland for the Solsmart Bronze designation and Solar Guide.
- City of Dover for the Over Fire Combustion project.

AMP Hard Hat Safety Awards

Member utilities with 2018 Hard Hat Award winners were:

- Bryan Municipal Utilities
- Cleveland Public Power
- Clyde Light & Power
- Cuyahoga Falls Electric System
- Dover Light & Power
- Dover Light & Power – Generation
- Borough of Ephrata Electric Division
- Hamilton Utilities
- Haskins Electric
- Napoleon Light & Power
- Orrville Utilities
- St. Clairsville Electric Department
- Shelby Division of Electric and Telecommunications
- Versailles Electric Department
- Wadsworth Electric Department
- Wellington Electric Department
- Westerville Electric Division

The 10 AMP members below received Reliable Public Power Provider (RP3) designation from the APPA in 2018. They joined the 16 AMP and DEMEC members who received the recognition in 2017, the four AMP members in 2016, the nine AMP members in 2015, and the 14 AMP and DEMEC members recognized in 2014.

DIAMOND

Cleveland
Hudson
Piqua

PLATINUM

Bowling Green
Coldwater
Ephrata
St. Clairsville

GOLD

New Martinsville
Oak Harbor
Orrville Utilities

Sustainability Performance 2014-2018

	2014	2015	2016	2017	2018
AMP Organization and Financial Metrics					
Number of member communities	130	131	135	135	135
Load (in million MWh)	16.5	16.5	16.7	16.4	17.2*
System peak (in MW)	3,346	3,378	3,416	3,400	3,478
Electric revenue (in \$)	\$1,012,684,268	\$1,103,886,270	\$1,218,475,675	\$1,203,615,402	\$1,243,722,977
Service fees (in \$)	\$10,913,504	\$11,515,575	\$11,501,983	\$10,981,725	\$11,679,120
Programs and other revenue (in \$)	\$16,305,240	\$12,589,167	\$12,513,647	\$14,362,362	\$13,393,319
Operating expenses (in \$)	\$937,845,012	\$1,002,832,762	\$1,028,599,138	\$982,458,119	\$1,045,579,528
Net margin (in \$)	\$2,577,656	\$5,823,840	\$10,247,552	\$3,530,525	\$2,787,334
Number of employees (AMP and MESA as of 12/31)	178	180	156	165	156
Power Generation (in net MWh)					
Prairie State Energy Campus (AMP share)	2,185,294	2,592,694	2,461,472	2,514,386	2,657,311
AFEC	2,351,669	3,649,554	2,683,735	3,154,240	4,034,478
Belleville Hydro	303,340	258,668	273,205	274,360	226,031
Distributed Generation (gas, diesel units)	6,561	9,498	19,615	17,139	22,803
AMP Wind Farm	14,262	13,086	10,892	12,076	11,214
Napoleon Solar	5,147	5,111	4,888	4,905	3,736
Greenup Hydro (total plant)	0	0	235,313	259,398	211,362
Meldahl Hydro (total plant)	0	0	366,655	490,875	425,049
Cannelton Hydro	0	0	343,202	449,129	354,851
Willow Island Hydro	0	0	218,242	230,523	207,698
Landfill Gas**	370,642	373,821	363,104	382,320	387,750
Blue Creek Wind	135,645	138,109	136,861	141,448	126,108
Smithland Hydro	0	0	0	164,489	219,454
Solar Phase II	0	0	0	42,232	57,281
Total	5,372,560	7,040,541	7,117,184	8,137,521	8,945,126
Efficiency and Other Offsets to Traditional Generation					
Efficiency Smart - cumulative generation savings since 2011 (in MWh)***	142,002	159,416	189,950	204,865	218,636
% of 2011-2013 targets	-	-	-	-	-
Cumulative % of 2014-2016 targets	48%	97%	161%	146%	-
Cumulative % of 2017-2019 targets	-	-	-	36%	75%
EcoSmart Choice (green energy sales in MWh)	9,645	41,871	48,021	43,420	49,187
Health and Safety					
Employee work-related fatalities	0	0	0	0	0
Reportable incidents or accidents	0	1	2	1	0
Lost work-day incidents	0	1	1	0	0

* The reported load (in million MWh) for 2018 is an estimate.

** Prior sustainability reports underreported landfill gas generation by approximately 48,000 MWh annually, corrected figures are shown.

*** 2017-2019 targets include linear allocations of the Efficiency Smart 2 contract for Hamilton, which ran from February 2015 through March 2018.

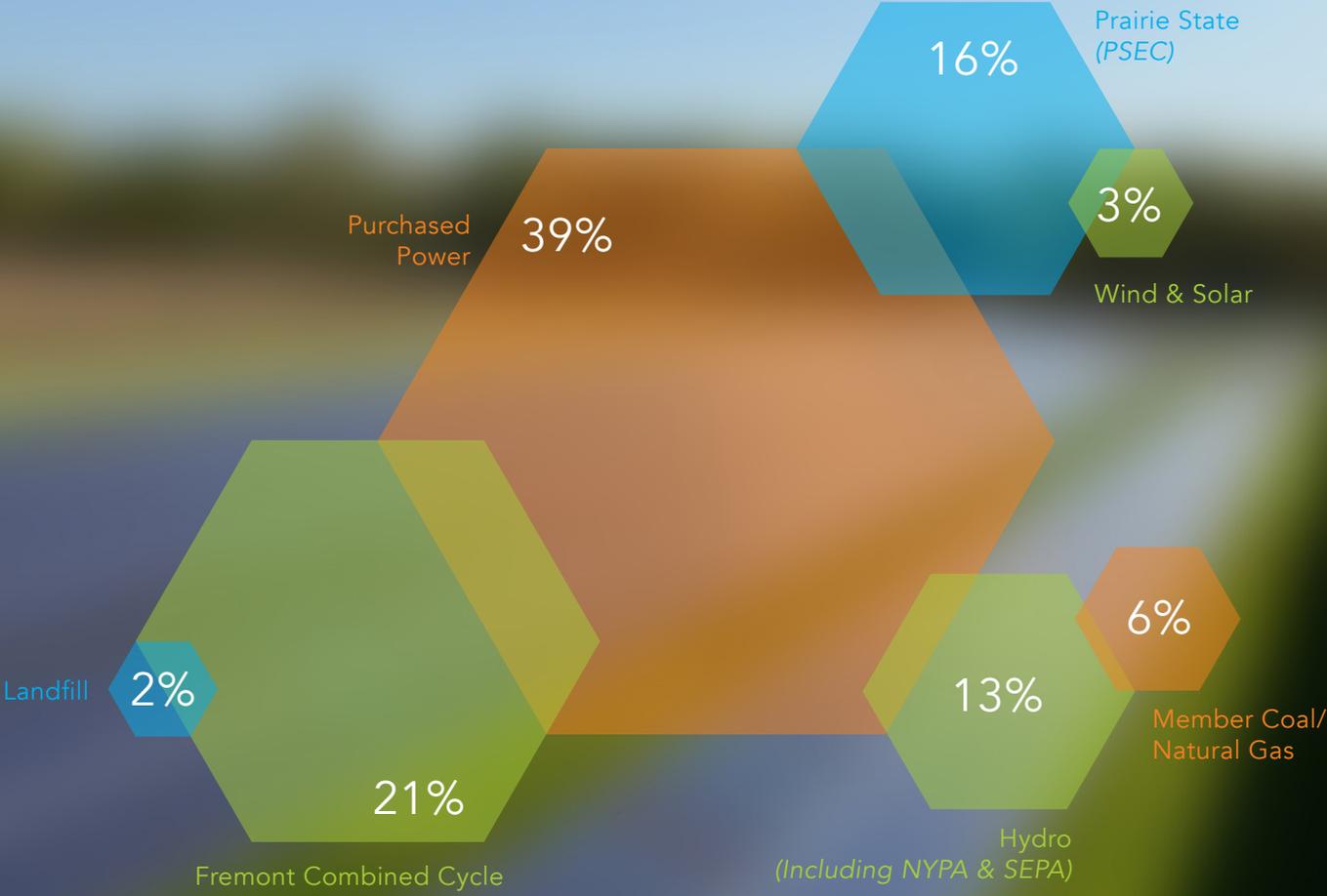
	2014	2015	2016	2017	2018
Environment					
Permit violations	0	0	0	0	0
Fines or penalties	0	0	0	0	0
NPDES permit exceedances	0	0	1 ¹	0	0
CO2 emissions (in short tons)	3,276,805	3,967,732	3,798,210	4,068,820	4,732,824
Annual CO2 emission rate (in lbs/MWh)	1,220	1,127	1,067	1000	1,058
SO2 emissions (in short tons)	1,390	1,824	2,010	2,178	2,394
Annual SO2 emission rate (in lbs/MWh)	0.517	0.518	0.565	0.535	0.535
NOx emissions (in short tons)	775	894	1033	1035	1,171
Annual NOx emissions rate (in lbs/MWh)	0.289	0.254	0.290	0.254	0.262
PM emissions (in short tons)	63	79	122	100	139
Annual PM emission rate (in lbs/MWh)	0.023	0.022	0.034	0.025	0.031
CO emissions (in short tons)	540	352	146	106	164
Annual CO emission rate (in lbs/MWh)	0.201	0.100	0.041	0.026	0.04
VOC emissions (in short tons)	42	14	29	44	40
Annual VOC emission rate (in lbs/MWh)	0.016	0.004	0.008	0.011	0.009
Cooling water usage AFEC (net, in million gallons)	453	467	540	602	878
Cooling water usage AMP share of PSEC (in million gallons)	-	1,308	1,105	1,107	1,177
AMP HQ recycling (estimate, in pounds)	21,000	19,200	10,410	58,525	70,926
Forestry carbon projects – cumulative acres of trees planted	210	210	467	467	467
Community					
Number of scholarships awarded	8	8	8	8	8
Value of scholarships awarded	\$16,000	\$16,000	\$16,000	\$20,000	\$20,000
AMP employee charitable giving (payroll deduction in \$)	\$10,856	\$14,213	\$18,396	\$21,863	\$25,129

¹ minor sampling exceedance that has been addressed



2018 AMP Member Energy Resource Mix

(17,100,000 MWh)



Notes:

- The Member coal figure includes the participation of AMP members Paducah and Princeton in PSEC through the Kentucky Municipal Power Association.
- The wind and solar figure includes member-owned solar.
- The hydro figure includes member-owned hydro.



Emissions Avoidance 2018 Report

AMP Renewable Energy Production, Energy Efficiency: emissions avoidance	2018 MWh	CO2 emissions avoided (Tons)*	SO2 emissions avoided (Tons)*	NOx emissions avoided (Tons)*	Total emissions avoided (Tons)
Belleville Hydro (JV5)	226,031	100,358	72.33	55.38	100,485
Greenup Hydro	211,362	93,845	67.64	51.78	93,964
Meldahl Hydro	425,049	188,722	136.02	104.14	188,962
Cannelton Hydro	354,851	157,554	113.55	86.94	157,754
Willow Island Hydro	207,698	92,218	66.46	50.89	92,335
Smithland Hydro	219,454	97,438	70.23	53.77	97,562
AMP Wind Farm (JV6)	11,214	4,979	3.59	2.75	4,985
Napoleon Solar	3,736	1,659	1.20	0.92	1,661
Landfill Gas***	387,750	2,542,484	124.08	95.00	2,542,703
Blue Creek Wind	126,108	55,992	40.35	30.90	56,063
EcoSmart Choice	49,187	21,839	15.74	12.05	21,867
Efficiency Smart	218,636	97,074	69.96	53.57	97,198
Solar Phase II	57,281	25,433	18.33	14.03	25,465
Carbon Offset Forestation Projects	467 acres	487**			487
					3,461,444

*<https://www.pjm.com/-/media/library/reports-notices/special-reports/2018/2018-emissions-report.ashx?la=en>

**USEPA estimates 1.043 tons of CO2 is sequestered annually by one acre of average U.S. forest.

***Includes direct emissions reduced from methane (CO2e) and avoided emissions from CO2.

<https://www.epa.gov/lmop/landfill-gas-energy-benefits-calculator>

PJM Market Power Emissions Rate [1]	2018
CO2 emissions Factor (lbs/MWh)	888
SO2 emissions Factor (lbs/MWh)	0.64
NOx emissions Factor (lbs/MWh)	0.49

2018 PJM Market Power Fuel Breakdown [2]	2018
Nuclear	34.20%
Natural Gas	30.60%
Coal	28.60%
Wind and Solar	2.80%
Hydroelectric	2.30%
Other	1.50%
Total	100.00%

Green Bond Financed Hydro Projects 2018 Report

	Meldahl	Combined Hydro (Cannelton, Willow Island, Smithland)
Net renewable capacity (MW)	108.8	208
Net renewable generation (MWh)	425,049	782,003
Capacity factor (%)	45%	43%
Emissions avoidance [1] [2]		
Annual CO2 (GHG) emissions avoided (Tons)	188,722	347,209
SO2 emissions avoided (Tons)	136.02	250.24
NOx emissions avoided (Tons)	104.14	191.59

[1] PJM 2014-2018 CO2, SO2 and Nox Emissions Rates Report April 5, 2019

[2] PJM State of the Market Report, 2018 Table 3-9



Pennsylvania

Maryland

Delaware

Virginia

Girard

Smethport

Blakely

Grove City

New Wilmington

Wampum

Ellwood City

Zelenople

Summerhill

East Conemaugh

Hooversville

Berlin

Watsonstown

Catawissa

Mifflinburg

Weatherly

Lehigh

Saint Clair

Schuylkill Haven

Duncannon

Kutztown

Quakertown

Perkasie

Hatfield

Lansdale

Goldsboro

Royalton

Ephrata

Lewisberry

DEMEC

Front Royal

Berlin

Philippi

Bedford

Martinsville

Danville



2018

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