



# *Agricultural Electrification*

CAREER DEVELOPMENT EVENT



A guide to the EMC/FFA  
Electrification Career Development Event:

A competitive educational program offering scholarships,  
which promotes the safe, efficient use of electrical energy

*2018-19 School Year Edition*



Sponsored by  
Georgia's Electric Membership Corporations  
and the Georgia Association FFA



## FOREWORD

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Education in our nation can never reach limitations in stressing the importance of the learning process. Formal training and education are invaluable in shaping each life as it matures. We learn from other people and experiences. Those who become the “best they can be” take advantage of the broadest possible range of opportunities. They may try, fail, and ultimately learn from their mistakes. Leaders develop best when they are enthusiastic participants in change.

Your local electric membership corporation or EMC and its statewide association Georgia EMC are very enthusiastic about the opportunity of working with the FFA in support of today’s young people. We believe that this EMC/FFA Electrification Career Development Event is an opportunity for change offering potential lifetime knowledge, and maybe even a career choice. This project which is rich in successful history and tradition is a mutually beneficial activity which develops leaders. With the encouragement of safe electrical wiring, an awareness of electricity, and methods of energy conservation, tomorrow’s citizens are informed individuals. With a firm belief that the spirit of competition brings forth the best in individuals in their striving for success, it is to the benefit of both the EMCs and local communities to support FFA involvement in programs like this EMC/FFA Electrification Career Development Event.

The 41 electric cooperatives in Georgia are proud of our state’s FFA chapters and offer assistance to make sure this organization provides the best educational opportunity for its young leaders. Your local EMC has printed materials, program and teaching aids available, as well as personnel to assist you in answering questions about this project.

You are invited to contact your local EMC to assist you and ask them for information about this event as well as the many careers available at your local cooperative that could give you the opportunity to live the cooperative “way of life.”

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## GEORGIA FFA ASSOCIATION

# *AGRICULTURAL ELECTRIFICATION (EMC)*

## CAREER DEVELOPMENT EVENT

### I. OVERVIEW

The Agricultural Electrification (EMC) Career Development Event is an activity, which provides opportunities for FFA members to demonstrate their skills in electrical wiring, critical thinking, and communications. The Electric Membership Corporations throughout Georgia sponsors these activities as a means of promoting education in the safe, efficient use of electrical energy.

### II. PURPOSE

The overall objective of the Agricultural Electrification (EMC) Career Development Event is to promote and expand educational programs in electrification for students enrolled in agricultural education. To achieve this objective, the CDE reinforces the classroom instruction and FFA supervised activity projects in three (3) stages consisting of a problem-solving exercise, practical wiring exercise, and an oral demonstration.

### III. ELIGIBILITY

Any active FFA member who is in grade 9, 10, 11, or 12 in the State of Georgia is eligible to participate in this activity. Chapters are limited to one (1) CDE contestant per chapter. The top two (2) individuals in the area CDE's may participate in the state CDE during the same year. *A contestant in the State Agricultural Electrification CDE placing 1<sup>st</sup> may not participate in this CDE again.*

### IV. RULES

**Presentation/Demonstration: (10 points or 10%)** Each CDE contestant will use effective communications skills in describing actual electrical wiring tasks. All participants will use the same topic: Materials, props, etc. will be provided. CDE contestants are encouraged to fully explain all necessary steps in performing the required electrical tasks. Presentations should be between 4 and 6 minutes. Points will be deducted from contestant's scores for presentations under 4 minutes and over 6 minutes. A panel of judges will score each CDE contestant on this phase of the CDE and will arrive at an average score of 1 – 10 points. These points will be included in the CDE contestant's total overall score. No written speeches will be allowed at the rostrum, notes (an outline of main points or bulleted references) may be used; however, points may be deducted. If notes are used, notes must be made on paper or note cards that measure 3" x 5" or less. Any note cards must be presented to judges for review prior to beginning the presentation. Notes must not be attached in any way to the wiring frame or any part of the speech demonstration.

**Problem-Solving: (30 points or 30%)** Each CDE contestant will complete a 30-item problem-solving activity within a 60 minute time limit. Each item will be a multiple-choice question relative to actual wiring practices, requirements of the National Electrical Code, and/or knowledge of rural electrification and electric cooperatives. Reference materials, which may be helpful in solving problems, will be available for use by the CDE contestant. No reference materials will be for available for the rural electrification and electric cooperatives problem-solving questions. Each problem-solving item will count one point toward each CDE contestant's total score.

**Wiring Problem: (60 points or 60%)** Each CDE contestant will complete an assigned wiring problem. Wiring problems could be 120 v 15 and/or 20 amp branch circuits, and/or 240 v 20 amp branch circuits. Judging will be based on the current National Electrical Code. The problem will be scored (60 points maximum) on workability of assigned problem, safety, efficiency in use of materials, time required to complete the problem, and neatness. Wiring materials will be provided. Each CDE contestant must furnish his/her own tools. Cordless drills and cordless screwdrivers may be used to install device boxes and service entrance strap. Cordless screwdriver 4.0 volts or less may be used to tighten conductors to device screws, devices to device box, and device cover plates to the device, **cordless drills may not be used beyond the installation of device boxes to the wiring frame and installing the service entrance strap.** No type of razor-cutting devices may be used.

#### **Incomplete Wiring Problem**

An incomplete wiring problem is the result of a contestant calling “Time” before the 90 minute cut-off in order to receive time credit. Even though the problem may work correctly as assigned, the contestant has not met the following criteria for a completed problem:

1. Secured branch circuit cables to frame with a minimum of five (5) staples.
2. Attached all devices to box.
3. Installed all cover plates.
4. Installed the service entrance cable into service entrance panel through the cable connector and secured the service entrance cable to the wiring frame with a service strap.
5. Installed the equipment grounding conductor and secured it with a minimum of one staple.
6. Install the bonding screw in the service entrance panel.

The problem is considered to be incomplete if the above criteria have not been met and the points that the contestant would have earned on time will be reduced to zero (0).

#### **V. EVENT FORMAT**

Individual students of FFA Chapters in grades 9 – 12 compete in one of six area Career Development Events with the top two (2) winners from each area participating in a final state CDE. The CDE contestants demonstrate skills in three (3) areas. The skills encompass the following:

1. A problem-solving exercise that examines the student’s knowledge of electric cooperative operation and history, electrical facts and knowledge, National Electric Code Book (NEC) usage, wiring circuit schematic interpretation, and circuit planning skills.
2. A practical wiring exercise of a specific electrical circuit that requires the CDE contestant to read a schematic, then plan and actually wire the circuit. This exercise provides a means to examine correct planning and wiring methods, efficiency and safety considerations in wiring.
3. An oral demonstration/presentation to strengthen leadership skills and abilities to communicate, using an assigned topic concerning some component of an electrical system.

## **VI. SCORING**

Scoring for Agricultural Electrification (Georgia Electric Membership Corporation) career development will consist of three parts: speech/demonstration activity (10% of the total score), problem-solving activity (30% of the total score), and wiring problem (60% of the total score).

## **VII. TIE BREAKERS**

In the event of a tie, first the CDE contestant with the highest wiring score, second the CDE contestant with the highest problem-solving score, third the CDE contestant with the highest speech/demonstration score will be declared the winner of the individual placing.

## **VIII. AWARDS**

Awards shall be determined each year by the Board of Trustees of the Georgia FFA Foundation. This event is made possible through the Georgia Electric Membership Corporation as a special project.

## **IX. REFERENCES**

National Fire Protection Assn. – “National Electrical Code” – Current Edition

The American Association for Vocational Instructional Materials (AAVIM) – “Electrical Wiring” – Current Edition

The American Association for Vocational Instructional Materials (AAVIM) – “Understanding Electricity” – Current Edition

The American Association for Vocational Instructional Materials (AAVIM) – “Electrical Controls” – Current Edition

The American Association for Vocational Instructional Materials (AAVIM) – “How Electric Motors Start & Run” – Current Edition

ElecLearning.org – “Agricultural Wiring Handbook” – Current Edition

Georgia Electric Membership Corporation – “History of Georgia’s Electric Membership Corporations” – page 12 of this publication.

Georgia Electric Membership Corporations "History of the EMC Electrification Career Development Event" Current Edition - page 11 of this publication

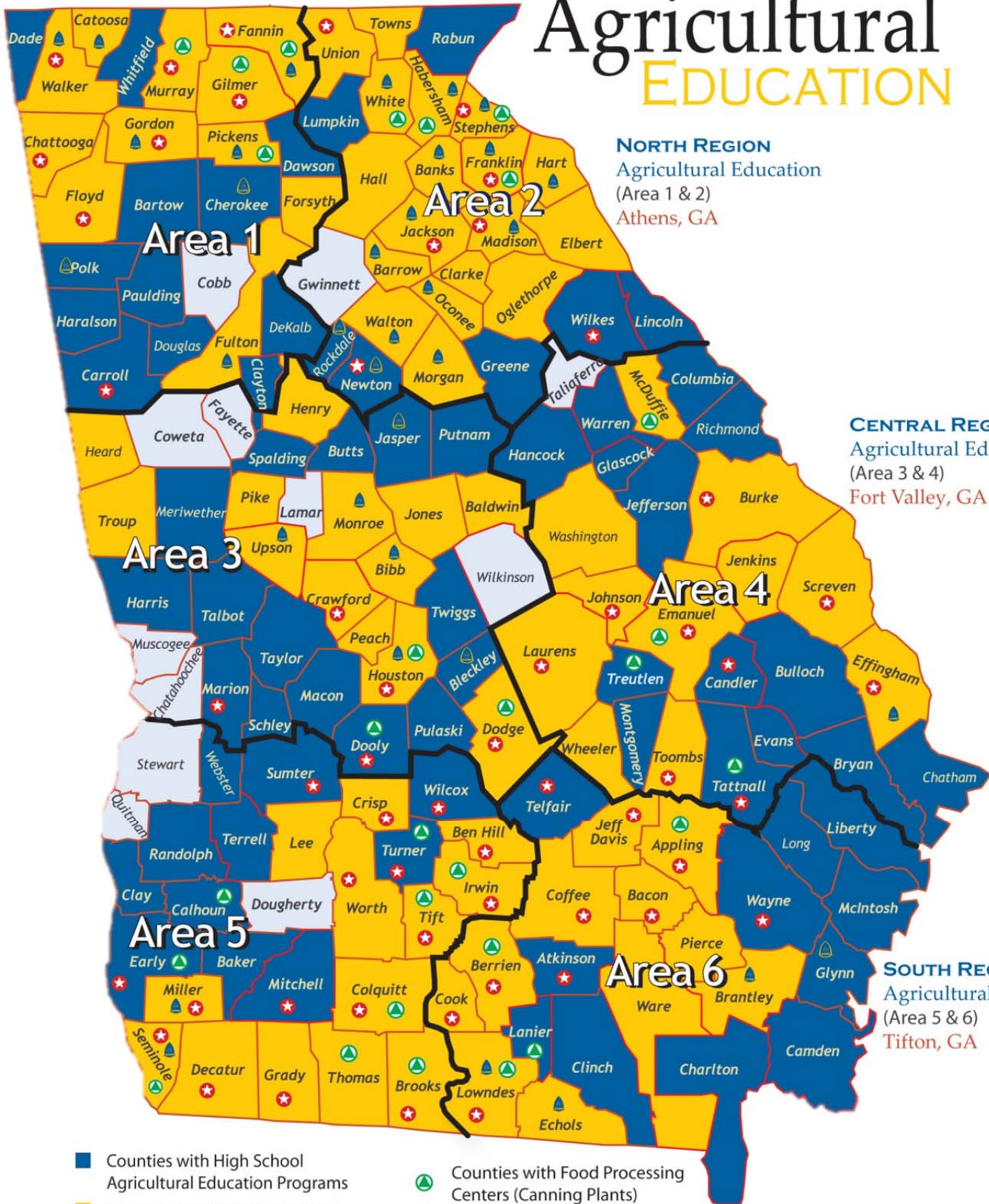
Georgia Electric Membership Corporation – Student Guide to Wiring

## **X. OFFICIAL DRESS GUIDELINES**

Official Dress for an FFA member includes:

- An official FFA jacket zipped to the top.
- Black slacks and black socks/nylons or black skirt and black nylons.
- White collared blouse or white collared shirt.
- Official FFA tie or official FFA scarf.
- Black dress shoes with closed heel

# GEORGIA Agricultural EDUCATION



# EMC/FFA Electrification Career Development Event Contacts



**Gale Cutler**  
Public Relations Coordinator  
Georgia Electric Membership Corporation  
P.O. Box 1707  
Tucker, GA 30085-1707  
(770) 270-6966  
(770) 270-6995 Fax  
[gale.cutler@georgiaemc.com](mailto:gale.cutler@georgiaemc.com)

Contact information for all state Agricultural Education staff can be found at  
<http://www.gaaged.org/directory/staff.aspx>



## Region Contacts


### North Region

Area I	Area II
<div style="display: flex; align-items: center;"> <div> <p><b>Mr. Stan Mitchell</b></p> <p>North Region Director</p> <p>Four Towers, UGA Athens, GA 30602 (706) 552-4461 (706) 542-9602 Fax <a href="mailto:smitchell@doe.k12.ga.us">smitchell@doe.k12.ga.us</a></p> </div> </div>	<div style="display: flex; align-items: center;"> <div> <p><b>Mr. Sidney Bell</b></p> <p>Ag Mechanics Area Teacher</p> <p>Four Towers, UGA Athens, GA 30602 (706) 552-4464 (706) 542-9602 Fax <a href="mailto:sbell@gaaged.org">sbell@gaaged.org</a></p> </div> </div>
<div style="display: flex; align-items: center;"> <div> <p><b>Mrs. Stacey Fields</b></p> <p>Amicalola EMC</p> <p>544 Highway 515 South Jasper, GA 30143 (706) 253-5287 (706) 253-5288 Fax <a href="mailto:staceyf@amicalolaemc.com">staceyf@amicalolaemc.com</a></p> </div> </div>	<div style="display: flex; align-items: center;"> <div> <p><b>Mr. Richard Heard</b></p> <p>Rayle EMC</p> <p>P. O. Box 1090 Washington, GA 30673 (770) 706-678-2116 (706) 678-5381 Fax <a href="mailto:richard.heard@rayleemc.com">richard.heard@rayleemc.com</a></p> </div> </div>





## Central Region

Area III	Area IV
<div style="display: flex; align-items: center;">  <div> <p><b>Mr. Chris Corzine</b></p> <p>Central Region Director</p> <p>P. O. Box 4060 1005 State University Dr. Fort Valley, GA 31030 (478) 822-7385 (478) 825-6980 Fax <a href="mailto:ccorzine@doe.k12.ga.us">ccorzine@doe.k12.ga.us</a></p> </div> </div>	<div style="display: flex; align-items: center;">  <div> <p><b>Mr. Kevin Jump</b></p> <p>Ag Mechanics Area Teacher</p> <p>P. O. Box 4060 1005 State University Dr. Fort Valley, GA 31030 (478) 825-6068 (478) 825-6980 Fax <a href="mailto:kjump@gaaged.org">kjump@gaaged.org</a></p> </div> </div>

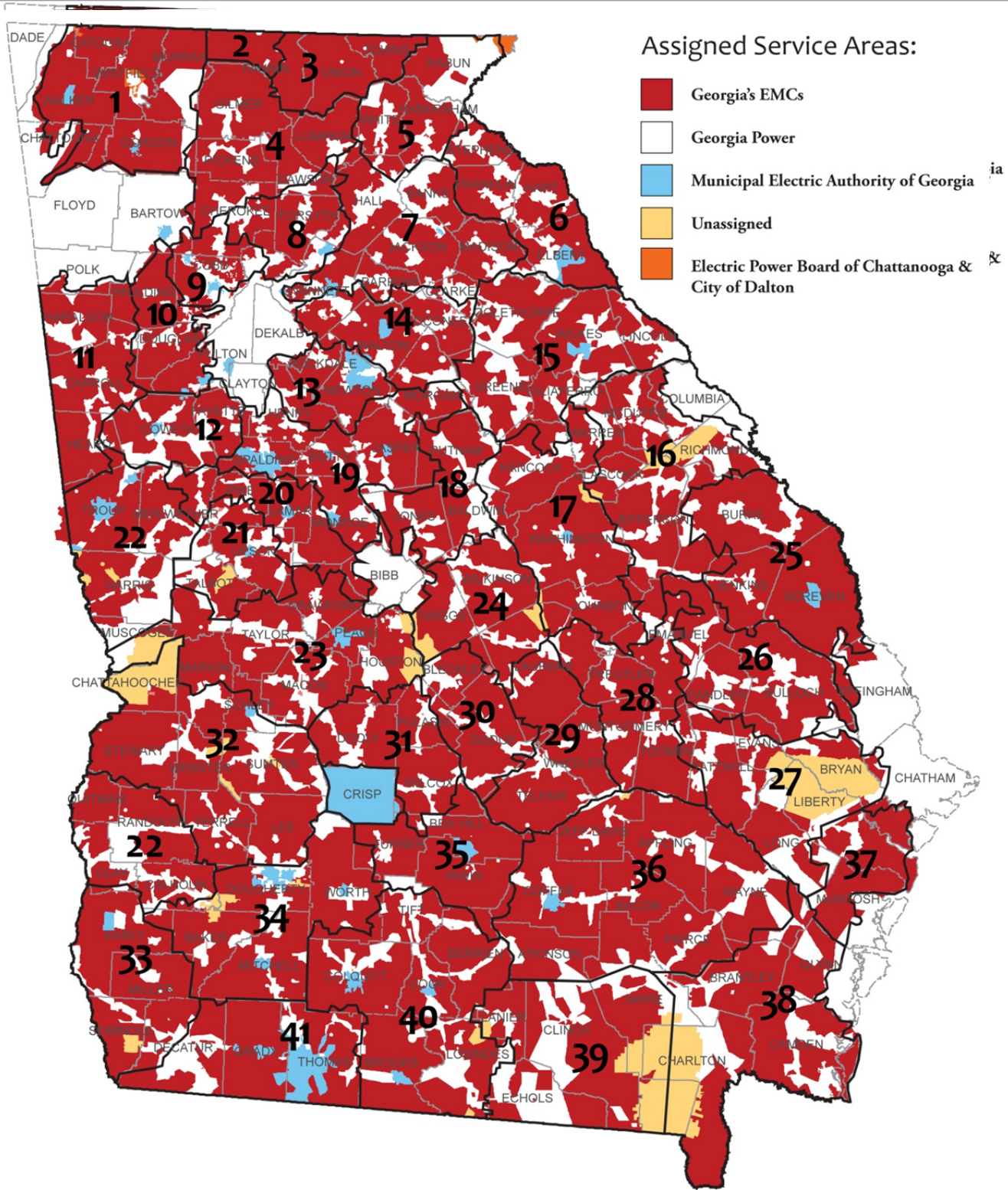
<div style="display: flex; align-items: center;">  <div> <p><b>Mrs. Kim Broun</b></p> <p>Tri-County EMC</p> <p>PO Box 487 Gray, GA 31032 (478).986-8126 (478).986-4733 Fax <a href="mailto:kimb@tri-countyemc.com">kimb@tri-countyemc.com</a></p> </div> </div>	<div style="display: flex; align-items: center;">  <div> <p><b>Mr. Randy Hill</b></p> <p>Planters EMC</p> <p>P. O. Box 979 Millen, GA 30442-0979 (478) 982-4722 ext. 246 (478) 982-4798 Fax <a href="mailto:randy.hill@plantersemc.com">randy.hill@plantersemc.com</a></p> </div> </div>
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## South Region

Area V	Area VI
<div style="display: flex; align-items: center;">  <div> <p><b>Mr. Shawn Collins</b></p> <p>Interim Region Director</p> <p>ABAC 34, 2802 Moore Hwy Tifton, GA 31793 (229) 386-3198 (229) 386-3457 Fax <a href="mailto:scollins@gaaged.org">scollins@gaaged.org</a></p> </div> </div>	<div style="display: flex; align-items: center;">  <div> <p><b>Mr. Jerry Stone</b></p> <p>Ag Mechanics Area Teacher</p> <p>ABAC 34, 2802 Moore Hwy Tifton, GA 31793 (229) 225-5050 (229) 386-3457 Fax <a href="mailto:jstone@gaaged.org">jstone@gaaged.org</a></p> </div> </div>

<div style="display: flex; align-items: center;">  <div> <p><b>Mr. Nathan Ireland</b></p> <p>Mitchell EMC</p> <p>P. O. Box 409 Camilla, GA 31730 (229) 336-5221 (229) 336-7088 Fax <a href="mailto:nathan.ireland@mitchellemc.com">nathan.ireland@mitchellemc.com</a></p> </div> </div>	<div style="display: flex; align-items: center;">  <div> <p><b>Mr. Justin Franks</b></p> <p>Satilla REMC</p> <p>P. O. Box 906 Alma, GA 31510 (912) 632-7222 (912) 632-3724 Fax <a href="mailto:jfranks@satillaemc.com">jfranks@satillaemc.com</a></p> </div> </div>
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# Georgia's Electric Suppliers



## Georgia Electric Membership Corporations:

- |                    |                     |                     |                   |                     |                |
|--------------------|---------------------|---------------------|-------------------|---------------------|----------------|
| 1. North Georgia   | 8. Sawnee           | 15. Rayle           | 22. Diverse Power | 29. Little Ocmulgee | 36. Satilla    |
| 2. Tri-State       | 9. Cobb             | 16. Jefferson       | 23. Flint         | 30. Ocmulgee        | 37. Coastal    |
| 3. Blue Ridge Mtn. | 10. GreyStone Power | 17. Washington      | 24. Oconee        | 31. Middle Georgia  | 38. Okefenokee |
| 4. Amicalola       | 11. Carroll         | 18. Tri-County      | 25. Planters      | 32. Sumter          | 39. Slash Pine |
| 5. Habersham       | 12. Coweta-Fayette  | 19. Central Georgia | 26. Excelsior     | 33. Three Notch     | 40. Colquitt   |
| 6. Hart            | 13. Snapping Shoals | 20. Southern Rivers | 27. Canoochee     | 34. Mitchell        | 41. Grady      |
| 7. Jackson         | 14. Walton          | 21. Upson           | 28. Altamaha      | 35. Irwin           |                |

Links to the Web sites of Georgia's EMCs listed below can be found at  
[www.georgiaemc.com](http://www.georgiaemc.com) in the EMCs of Georgia section

1.	North Georgia EMC	Dalton, GA	706-259-9441
2.	Tri-State EMC	McCaysville, GA	706-492-3251
3.	Blue Ridge Mountain EMC	Young Harris, GA	706-379-3121
4.	Amicalola EMC	Jasper, GA	706-253-5200
5.	Habersham EMC	Clarksville, GA	706-754-2114
6.	Hart EMC	Hartwell, GA	706-376-4714
7.	Jackson EMC	Jefferson, GA	706-367-5281
8.	Sawnee EMC	Cumming, GA	770-887-2363
9.	Cobb EMC	Marietta, GA	770-429-2100
10.	GreyStone Power Corp.	Douglasville, GA	770-942-6576
11.	Carroll EMC	Carrollton, GA	770-832-3552
12.	Coweta-Fayette EMC	Palmetto, GA	770-502-0226
13.	Snapping Shoals EMC	Covington, GA	770-786-3484
14.	Walton EMC	Monroe, GA	770-267-2505
15.	Rayle EMC	Washington, GA	706-678-2116
16.	Jefferson Energy Cooperative	Wrens, GA	706-547-2167
17.	Washington EMC	Sandersville, GA	478-552-2577
18.	Tri-County EMC	Gray, GA	478-986-8100
19.	Central Georgia EMC	Jackson, GA	770-775-7857
20.	Southern Rivers Energy	Barnesville, GA	770-358-1383
21.	Upton EMC	Thomaston, GA	706-647-5475
22.	Diverse Power	LaGrange, GA	706-845-2000
23.	Flint Energies	Reynolds, GA	478-847-3415
24.	Oconee EMC	Dudley, GA	478-676-3191
25.	Planters EMC	Millen, GA	478-982-4722
26.	Excelsior EMC	Metter, GA	912-685-2115
27.	Canoochee EMC	Reidsville, GA	912-557-4391
28.	Altamaha EMC	Lyons, GA	912-526-8181
29.	Little Ocmulgee EMC	Alamo, GA	912-568-7171
30.	Ocmulgee EMC	Eastman, GA	478-374-7001
31.	Middle Georgia EMC	Vienna, GA	229-268-2671
32.	Sumter EMC	Americus, GA	229-924-8041
33.	Three Notch EMC	Donalsonville, GA	229-524-5377
34.	Mitchell EMC	Camilla, GA	229-336-5221
35.	Irwin EMC	Ocilla, GA	229-468-7415
36.	Satilla REMC	Alma, GA	912-632-7222
37.	Coastal EMC	Midway, GA	912-884-3311
38.	Okefenoke REMC	Nahunta, GA	912-462-5131
39.	Slash Pine EMC	Homerville, GA	912-487-5201
40.	Colquitt EMC	Moultrie, GA	229-985-3620
41.	Grady EMC	Cairo, GA	229-377-4182

## EMC/FFA CDE QUOTES

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*Thank you Georgia's EMCs for your partnership with the FFA. This event is complex, challenging and requires many hours of preparation. But in the end it is the most practical and rewarding contest that I have competed in. I was really excited to be able to win on the 50th anniversary of this contest. All the time spent in preparation was most definitely worth it in the end."*

Kirk Beacham  
2018 EMC/FFA State CDE Winner (50th Anniversary)  
Colquitt County FFA

*Being able to participate in the EMC/FFA CDE was by far one of the greatest highlights of my FFA career. I thoroughly enjoyed interacting with all of the EMC personnel and being able to take away a skill set that will surely help me in many aspects of life. I hope to be able to help out with this CDE in any way possible after I graduate to be able to give other members the same opportunities that I had.*

Cole Sosebee  
2015 EMC/FFA State CDE Winner  
White County FFA

*The Georgia FFA/EMC Wiring CDE is the most appealing CDE for me as an Agriculture Instructor. Watching a student's abilities grow as he or she works towards competition is rewarding. It takes an exceptional student to speak, think critically and prove his electrical wiring skills required of this contest. Thank you Georgia EMC for your support, encouragement and opportunity you give our students.*

Timmy White  
Ag Mechanics Instructor, Coffee County High School

*The EMC CDE is perhaps the most challenging competition that I have had the opportunity to participate in. It takes many hours of preparation. I have participated for two years and was fortunate to win the Area and State in my senior year. My plans are to become an Ag teacher and to encourage my students to enter this great CDE. Many thanks to Georgia's EMCs for their investment in the lives of FFA members.*

Dustin Hart  
2008 EMC/FFA State CDE Winner  
Colquitt County FFA

*The Georgia FFA/EMC Wiring Contest is one of my favorites as an Ag teacher. This CDE teaches critical thinking skills and public speaking skills as well as electrical wiring skills that a student can use in whatever career path that they choose. Thank you Georgia EMC for your partnership with the FFA and the encouragement and opportunity that you give to the students.*

Mr. Stacey Beacham  
Honorary State FFA Degree 2007  
Ag Mechanics Teacher, Colquitt County High School

*Participating in the EMC/FFA CDE has given me the chance to develop and use skills that I never knew that I had. By participating in the CDE, I have found my career choice in the electricity field. This has impacted my life by gaining leadership and self-confidence. Thank you to all who work to make this a great experience.*

Stephen Strickland  
2006 EMC/FFA State CDE Winner  
Colquitt County FFA

*Participating in the EMC/FFA Electrification Career Development Event is one of the most memorable events throughout my high school career. The contest is the most difficult that I have ever participated in and it has taught me dedication and how to work hard to achieve my goals. The contest has also helped me with my future career goals in life to go to college and earn a degree in electrical engineering.*

Brandon Pritchett  
2005 EMC/FFA State CDE Winner  
Wayne County FFA

*The EMC/FFA CDE is a wonderful opportunity that is made available to students all across the state. I was able to participate in this event for three years and gained many skills that I can use for a lifetime. The scholarship money that is provided by Georgia EMC is very helpful in my education. Many thanks to Georgia's EMCs and all those involved for what I believe is a most influential CDE.*

Britt Shiver  
2002-2004 EMC/FFA Area V Winner and State CDE participant  
Colquitt County FFA

*The EMC contest gave me direction in selecting a career as an electrician and the skills that I learned helped me to get my current job. The wiring skills, problem solving, and speaking skills that I learned helped to prepare me for technical college and dealing with customers. It was a great experience and has had a tremendous impact on my life. I would like to thank all of the individuals that worked to make this opportunity available to me and to other youth in Georgia.*

Kelvin Kitchens  
2003 EMC/FFA State CDE Winner  
Washington-Wilkes FFA Chapter

*Participating in the State EMC/FFA electrification contest was one of the greatest learning experiences I've ever had. The contest opens windows of opportunity for all who participate. Being such a prestigious contest, anyone who participates should feel honored. Through the contest I've been able to explore new fields, and make decisions for the future.*

John Bramblett  
American FFA Degree 2002  
Georgia FFA North Region Vice President 2001-2002  
2000 EMC/FFA State CDE Winner  
Jefferson City FFA Chapter

*I would like to thank Georgia EMC for sponsoring the electrical wiring CDE. Your assistance and sponsorship of this contest is what makes it the most exciting and prestigious CDE in the state. It is always exciting for me to see one of my students continue on into the electrical field because of the experience, knowledge, and financial assistance that they have received in this CDE.*

Scott Wheatley  
Banks County FFA Advisor

*The EMC/FFA Electrification Career Development Event combines knowledge of the National Electric Code, wiring skills, and leadership into one noteworthy activity. The vital information and speaking skills that are obtained serve as life long influences on any person's life, male or female. The basic principles are useful to an individual of any background and any future career goal.*

*Personally, the event gave me the perseverance and dedication needed to complete a physical task with the determination and hard work needed to learn electrical standards. It will truly serve as a meaningful part of my life skills education.*

Carol Spruill  
Georgia FFA President 1997-1998  
1997 EMC/FFA State CDE Winner

*I know from first-hand experience how beneficial the (EMC/FFA) CDE can be. I was fortunate to win the 1973 State Electrical Wiring CDE. The scholarship money I won paid for my first two years of college at Gainesville Junior College. If not for that money, my college education would have been postponed.*

*During my years of teaching, I have seen this CDE help many students "blossom" into a level of confidence they did not realize they could reach. Many of these students have also gone on to pursue work or a career related to the electrical industry.*

Tony Embrick  
Honorary American FFA Degree 2002  
Agriculture Teacher, Jackson County High School (retired)

## HISTORY OF THE EMC/FFA ELECTRIFICATION CAREER DEVELOPMENT EVENT

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*“The enthusiasm and spirit the FFA members show each year in the EMC/FFA Electrification Career Development Event overwhelms us. This has been, and we hope it will continue to be, our most successful endeavor. Each year the Career Development event has been an improvement over the year before.”* These remarks, from Jerry L. Dover, 1973-1974 Electrification Career Development Event Committee Chairman, present a common sentiment of those associated with the EMC/FFA Career Development Event.

The EMC/FFA Career Development Event began at Carroll EMC in the early 1960s. Skip Yow, a Carroll EMC employee, developed plans for an electrical wiring Career Development Event.

In 1966, five North Georgia EMCs cooperated in an “area” CDE that featured a team format. The first place individual winner received a \$500 college scholarship.

The first statewide EMC/FFA CDE was held at Flint EMC’s Reynolds, Georgia office in March 1968. Eliminations took place in six district CDEs held that February. The two top CDE contestants in each district were eligible to compete in the state CDE. Nearly 350 students from 116 FFA chapters participated on the district level.

The state CDE that year had four parts. First was an oral presentation on rural electrification. Second was the submission of a record of electrical projects completed by the student. Third, a true-false examination on wiring and rural electrification was given. Fourth, an actual wiring problem was given to the student to solve. Larry Stallings of the Heard County FFA Chapter was the first state CDE winner.

Since the first state meet, the CDE has been fine-tuned over time. For a time, the CDE was divided into individual and chapter competitions. The record of wiring projects was eliminated from the individual CDE; this component was merged into the chapter competition. Wiring teams were eliminated.

Additional improvements included the change of the examination from a true-false format to multiple choice questioning. Since this time, the written test has been changed again, this time to a problem-solving exercise. Hands-on problems are displayed and CDE contestants are required to use practical knowledge to arrive at the best solution for each problem.

The oral, or “speech,” element of the CDE has also been revised. Currently in lieu of a three to four minute speech, the CDE contestant gives a presentation/demonstration explaining an actual electrical wiring task. Examples of wiring materials are used to make the demonstrations more “life-like.”

The location of the state CDE also changed from the Reynolds location and is now held each year at the State FFA-FCCLA Center near Covington, GA.

Agricultural educators and EMC representatives still look for ways to improve an already good CDE. For example, the use of power hand tools for the wiring problems has been implemented.

*And what has happened to those young people who participated in the EMC/FFA CE of years past? Those students are now electricians, farmers, home builders, veterinarians, heating and air contractors, agricultural educators, engineers, EMC employees - - you name it.*

No matter what occupation these winners chose, all of them have one thing in common - - friendship and fond memories of the FFA program, their EMC and the EMC/FFA Career Development Event.

## HISTORY OF EMCs IN GEORGIA

It was a hot summer in 1924 when Franklin D. Roosevelt took his first vacation at his cottage in Warm Springs, Georgia, to recoup his failing health. One evening while sitting on his front porch looking out over the valley, he noticed no lights and this puzzled him.

Upon receiving his first month's electric bill, he discovered why.

“. . . There was only one discordant note in that first stay of mine at Warm Springs. When the first-of-the-month bill came in for electric lights for my little cottage, I found that the charge was 18 cents a kilowatt hour – about four times what I pay at Hyde Park, New York,” Roosevelt later said. “That started my long study of public utility charges for electricity into farm homes . . . . So it can be said that a little cottage at Warm Springs, Georgia, was the birthplace of the Rural Electrification Administration.”

Eleven years later on May 11, 1935, he signed the executive order that made REA a reality. That summer discovery had been the catalyst which produced one of the largest, most successful consumer service projects ever undertaken by the United States government.

The REA, under the auspices of the New Deal administration, was designed as part of a general program to bring electric power out of the cities to the countryside in order to stimulate economic growth and relieve unemployment. It is important to remember that no rural electric cooperative is owned or operated by the Rural Electrification Administration, nor does REA generate, distribute, or sell electricity.

The REA, now called the Rural Utilities Service or RUS is a federal agency in the U.S. Department of Agriculture, which provides loans and technical assistance to commercial, municipal and cooperative power companies provided they meet certain criteria. Most of the loans have been made to cooperatives to build distribution systems like your own local electric membership corporation (EMC).

America has had a love affair with electricity ever since Thomas A. Edison invented the light bulb and built the first central station electric system in lower Manhattan in 1882. Shortly afterward, cities all over the United States lit up. But, it was not until over 50 years later that the rural countryside surrounding the industrial cities started benefiting from the miracle of electricity.

At that time, nine out of ten families did without electric power. Today, 99% of the nation's farms have electric service.

How did it happen?

It began as early as 1923 when efforts were made to identify how electric power could be used on farms. The National Electric Light Association organized a committee that created and financed a rural electrification experiment near Red Wing, Minnesota with 20 farms.

Careful cost and production records were kept. The use of electricity dramatically increased, but production increased even more sharply. At the same time, overall operating expenses for the farmers dropped. They saw their lives were more productive and less tiring. The replacement of hand and animal labor by electric power worked better than expected. It looked as if the “miracle of electricity” would spread like wildfire throughout the countryside.

But it was not to be. At least, not yet.

Officials of the utility companies were not impressed. Service in the cities was their priority. Costs for bringing electric power to all outlying countryside were prohibitive. In a nutshell, though it was beneficial for the farmers, it was not seen to be profitable for the power companies.

The creation of the REA in 1935 was the necessary stimulus to spur power companies to an interest in rural electrification never displayed before. The primary function of the REA was to provide loans to power companies that would use the new funds to extend lines into rural America. Unfortunately, only a few companies applied for these funds.

In 1936, the Rural Electrification Act was signed. The Act made the REA the chief lending agency for 10 years, and made non-profit organizations such as cooperatives the main target of its funds. Thus was the customer-owned electric co-op born. And, though the coming world war was to create manpower and supply shortages, that first year of life for the new federal agency saw the number of farms connected for service increased by over 175%.

After the war, the enthusiasm for electrifying the countryside continued. The advent of new technology and the efforts of dedicated citizens throughout the United States enabled the REA to demonstrate effectively and profitably how the job could be done. Today, there are almost 1,000 rural electric cooperatives nationwide, thanks to the support and financing of RUS. Each one has several characteristics, which differ from investor-owned utilities.

For example, a cooperative is an enterprise that is jointly owned and equally controlled by those who use its services. It is a form of business more interested in service to its members than in making profits. (Of course, it must make enough revenue to pay its own way.) In any cooperative, memberships are open to all that want to use its services, generally for a small membership fee. Co-ops also reflect true democratic control; each member has one vote, regardless of the size of investment or amount of use.

Throughout their long history, Georgia's EMCs have worked with the other utilities to strengthen their common ability to serve the people of Georgia. The EMCs have done much of the leading along the way, including the building of distribution lines that now reach into 73 percent of Georgia's land area. In 1974, the EMCs formed Oglethorpe Power Corporation, a generation and transmission cooperative, to assure the delivery of electricity to parts of the State not served by Georgia Power.

In 1975, Georgia's EMCs came to the financial aid of Georgia Power with an infusion of \$513 million. Demand for electricity was soaring and the cooperatives stepped in to help shoulder the burden of building new generating units. EMCs became involved in Plant Vogtle, a nuclear generating facility, when Georgia Power Company again found itself in financial difficulty, and again turned to the EMCs for assistance.

By 1987, the EMC investment in Plant Vogtle had grown to \$2.9 billion. Without the financial help of the EMCs, Georgia Power would likely have been forced to shut down construction, leaving an expensive bill for its customers and shareholders to pay. Our action in coming to the aid of Georgia Power in the '70s and '80s enabled Georgia Power to realize lower interest costs in building Plant Vogtle. All utilities involved shared in the savings that resulted from the ability of the electric co-ops to borrow at low rates, which kept all of Georgia's power rates lower.

Overcoming all the obstacles encountered in building Plant Vogtle is an excellent example of how our electric utilities have always taken a "one Georgia" view of electricity supply, underscoring the EMC commitment to strengthen our communities and our state.

In Georgia, the 41 electric membership cooperatives serve approximately half of Georgia's population - 4.5 million-plus residents –and more than 75,000 commercial and industrial customers. As a result of nearly eight decades of dedicated effort to improve the quality of life in rural America, many electric co-ops enjoy a value to their communities that goes beyond their ability to simply provide reliable light and heat. Communities depend on them for their economic development initiatives, their civic leadership, and their commitment to local job creation.



Although your local EMC is responsible for delivering power, it works closely with other cooperative businesses in accomplishing that task. Today, they can take credit for the formation of the nation's largest generation cooperative, Oglethorpe Power Corporation ([www.opc.com](http://www.opc.com)).

Georgia Electric Membership Corporation ([www.georgiaemc.com](http://www.georgiaemc.com)) is the statewide trade association for Georgia's EMCs. GEMC supports youth and community leadership activities across the state and provides services in the areas of government relations, safety and training programs, economic development and communications, including publishing the state's largest circulation monthly publication, *GEORGIA Magazine* ([www.georgiamagazine.com](http://www.georgiamagazine.com)).

Looking towards the need for environmentally friendly and economically sensible power generation for our growing state, Georgia's EMCs formed a new cooperative called Green Power EMC ([www.greenpoweremc.com](http://www.greenpoweremc.com)). An idea conceived in 2001 and operational by 2003, Green Power EMC is the first renewable energy program in Georgia and is one of the largest renewable energy programs in the southeastern United States.

Georgia's first renewable energy program, Green Power EMC, provides electricity through its 38 member EMCs. A nonprofit corporation, Green Power EMC uses green resources such as low-impact hydroelectric plants, biomass, landfill gas, and solar to generate electricity.

Green Power EMC Members' renewable energy projects totaled nearly 280 megawatts (MW) of capacity by the end of 2017. That's enough energy to help power more than 55,000 homes in Georgia each year.

Green Power EMC is also educating middle and high school students about the benefits of solar energy. Through the Sun Power for Schools program, participating EMCs partner with schools to install a photovoltaic system to harness energy from the sun and provide on-line data monitoring in the classroom. This is the first statewide academic program to evaluate the cost effectiveness of solar energy.

The forefathers of rural electrification were truly people with a purpose. The development of the rural electric program began in Georgia more than 75 years ago, and the dynamic growth hasn't slowed. Working together to attract new industry and build stronger communities, EMCs have contributed greatly to Georgia's growth.

### ***Georgia's 41 Electric Membership Corporations***

- ◆ Serve approximately 4.5 million residents – half of Georgia's population.
- ◆ Georgia's co-ops serve more customers than any other state network of EMCs in the nation.
- ◆ Cover 73 percent of Georgia's land area, serving customers in 157 of Georgia's 159 counties.
- ◆ Average less than 10 customers per mile of distribution line, compared with 35 customers per mile for investor-owned electric utilities and 47 customers per mile for municipal electric utilities.
- ◆ Employ almost 6,000 workers.
- ◆ Operate as not-for-profit cooperatives to offset cost of serving large land areas.
- ◆ Operate the largest distribution network in the state by far, with more than 181,000 miles of electric power lines.
- ◆ You can find out more about Georgia's EMCs by going to [www.georgiaemc.com](http://www.georgiaemc.com)

# STATE FFA-EMC ELECTRIFICATION CONTEST

## RULES / INSTRUCTIONS

### A. General:

1. Each contestant is responsible for providing his/her own tools. Any tool not specifically prohibited by the rules of this CDE as published will be considered proper tools unless deemed unsafe by the CDE superintendent.

\*\* Tools that cannot be used:

- Razor cutting devices. (Utility knives, box cutters, etc)
- Corded Drills of any kind.
- Cordless Drills for any use other than mounting boxes and Service Entrance straps.
- Cordless screwdrivers over 4.0 volts.

2. No outside material or references will be allowed. Use only the references and materials provided to you for planning and completion of the assigned wiring problem.

3. All materials will be SURFACE MOUNTED on the wiring panel (simulated wall) following the accepted 1/3 rule with the 1 1/2" edge surface of the Top 2 X 4 (plate) representing the ceiling and the studs representing wall studs. (Lights in top 1/3-, switches in middle 1/3, and receptacles in bottom 1/3).

4. The overall allotted time for the wiring portion of this CDE will be two hours to include 30 minutes of planning, and 90 minutes of "work" time.

5. Safety Glasses must be worn during the wiring portion of the CDE.

6. In case of an accident, notify the judge immediately. We will stop your time, treat your injury, and then resume the contest.

**B.** Each contestant will have a maximum of 30 minutes to make plans and procure materials after the wiring problem given out. During this 30 minute period, the contestant will be allowed to:

1. From the floor plan, make a wiring Diagram drawing of the circuit on the paper provided. (Not to be graded.)

2. Using the Diagram as a guide, select the proper devices and materials needed to complete the wiring problem according to the 2017 National Electric Code and complete the Bill of Materials provided with the exception of circuit wire, Service Entrance cable, and Grounding wire, which will be available free choice after wiring time has begun. Economy of materials should be considered; you will be docked points for extra or excessive materials left over after completing the problem.

3. Present the completed Bill of Material to the "Storekeeper" who will assemble the requested materials.

4. After picking up your items from your Bill of Materials, take the "sack" of materials back to your station, lay out the materials and check for correctness of ordered materials but no "work" can begin. Work includes anything other than laying out materials ordered to complete the assigned wiring problem and checking the materials for correctness.

\*\*If you ordered an incomplete Bill of Material, additional materials may be acquired by completing another Bill of Material form. Additional order forms may be acquired and filled, ONLY AFTER THE 90 MINUTE WIRING TIME HAS BEGUN. NO MATERIAL MAY BE RETURNED TO THE "STORE". If the Bill of Materials was not filled correctly, bring it to the attention of your "storekeeper" immediately.

5. Lay out and arrange TOOLS in anticipation of beginning the wiring problem.

C. Each contestant will be given a maximum of 90 minutes to complete the actual wiring of the problem to include 60 minutes of "work" time in which to wire the problem without loss of points for time, and 30 minutes to complete the problem after the allotted 60 minutes resulting in loss of points for time. All "work" will cease after the 90 minute wiring period and the contestant will leave the wiring area to complete the Problem Solving and speech Demonstration portions of the CDE.

After the signal has been given, the contestant may:

1. Select wire from the supply available (list below). Do not carry coils of wire to your work station.
2. Install the circuit on the short side of the wiring panel (simulated wall) with the 1 1/2" edge surface of the Top 2 X 4 (plate) representing the ceiling and the studs representing studs.
3. Connect devices and lights with hooks at terminals only, DO NOT BACKWIRE! \*\*Exception is the GFCI outlet, which is designed to be back wired but does use the screw terminal in the process.
4. Since no weather head is installed, ground the Service Entrance Panel to an assumed "driven" ground.
5. Upon completion of the assigned problem, signal the time keeper. No further work can be done after "TIME" is called.
6. Problems will be mounted on the wiring panel as described on the floor plan. No points will be given for workability if installation is not the ASSIGNED PROBLEM.
7. All points gained for completing the problem within the 60 to 90 minute "work" period will be forfeited if the problem is deemed "Incomplete."
  - \*\* An incomplete wiring problem is the result of a contestant calling "Time" before the 90 minute cutoff in order to receive time credit. Even though the problem may work correctly as assigned, the contestant has not met the following criteria for a complete problem:
    - a. Secured branch circuit cables to the frame with a minimum of five (5) staples.
    - b. Attached all devices to boxes.
    - c. Installed all cover plates.
    - d. Installed the Service Entrance cable into the Service Entrance Panel through the cable connector and secured to the wiring frame with a service strap.
    - e. Installed the equipment grounding conductor and secured with a minimum of one staple.
    - f. Install the bonding screw in the service entrance panel.
  - \*\* Light bulbs do not have to be installed to be a "complete" problem and are not listed on the Bill of Material.
8. The wiring problem, ALL RELATED WORK SHEETS AND REFERENCES, and extra materials ordered from the "store" and not used, MUST BE LEFT AT THE WORK STATION after completing the problem for the contestant to be scored.
9. Judges will answer questions concerning DEFECTIVE MATERIALS, but not questions concerning the wiring problem.

The following sizes and types of wire will be available for the contestants to choose from:

SEU #2	3 conductor aluminum	No. 6 soft drawn bare copper
N.M. Cable	14/2 w/ground	N.M. Cable 12/2 w/ground
N.M. Cable	14/3 w/ground	N.M. Cable 12/3 w/ground

**NO WRITTEN SPEECHES WILL BE ALLOWED AT ROSTRUM.**

**NOTES (AN OUTLINE OF MAIN POINTS OR BULLETED REFERENCES) MADE ON PAPER OR NOTE CARDS THAT MEASURE 3" X 5" OR LESS MAY BE USED.**

**ANY NOTE CARDS TO BE USED MUST BE PRESENTED TO JUDGES FOR REVIEW PRIOR TO BEGINNING THE PRESENTATION.**

STATE BILL OF MATERIALS  
EMC/FFA CONTEST

Contestant Number \_\_\_\_\_

- \_\_\_\_\_ Box, 4" X 1 1/2" round or octagonal w/o clamps, 1/2" knockouts, w/lamp holder mounting screws
- \_\_\_\_\_ Box, 4" X 2 1/8" round or octagonal w/o clamps, 1/2" knockouts, w/lamp holder mounting screws
- \_\_\_\_\_ Box, 4" X 1 1/2" square, 1/2" knockouts, w/coverplate mounting screws
- \_\_\_\_\_ Box, 4" X 2 1/8" square, 1/2" knockouts, w/coverplate mounting screws
- \_\_\_\_\_ Box, 4" X 2 1/8" X 1 7/8" device, handy, w/o clamps, 1/2" knockouts
- \_\_\_\_\_ Box, 4" X 2 1/8" X 2 1/8" device, handy, w/o clamps, 1/2" knockouts
- \_\_\_\_\_ Box connector, 1/2" non-watertight
- \_\_\_\_\_ Box connector, 1" non-watertight
- \_\_\_\_\_ Oval service cable strap, #2 - 3 conductor
- \_\_\_\_\_ Circuit breaker, 15 amp, 120v, single pole
- \_\_\_\_\_ Circuit breaker, 20 amp, 120v, single pole
- \_\_\_\_\_ Circuit breaker, 20 amp, 120/240v, double pole
- \_\_\_\_\_ Coverplate, metal, duplex receptacle, handy box, w/ mounting screws
- \_\_\_\_\_ Coverplate, metal, GFCI duplex receptacle, handy box
- \_\_\_\_\_ Coverplate, metal, toggle switch, handy box, w/ mounting screws
- \_\_\_\_\_ Coverplate, metal, single duplex receptacle, for 4" square box, w/mounting screws for device
- \_\_\_\_\_ Coverplate, metal, GFCI duplex receptacle, for 4" square box
- \_\_\_\_\_ Coverplate, metal, double duplex receptacles, for 4" square box, w/mounting screws for device
- \_\_\_\_\_ Coverplate, metal, single switch, for 4" square box, w/mounting screws for device
- \_\_\_\_\_ Coverplate, metal, double switch, for 4" square box, w/mounting screws for device
- \_\_\_\_\_ Coverplate, metal, combination switch & duplex receptacle, for 4" sq. box, w/mounting screws for device
- \_\_\_\_\_ Coverplate, metal, single, 240v receptacle, handy box, w/mounting screws
- \_\_\_\_\_ Coverplate, metal, single, 240v receptacle for 4" square box
- \_\_\_\_\_ Lampholder, keyless
- \_\_\_\_\_ Receptacle, duplex outlet, grounding, w/mounting screws
- \_\_\_\_\_ Receptacle, duplex outlet, ground-fault circuit-interrupter type, w/mounting bolts and nuts
- \_\_\_\_\_ Receptacle, single, 240 v, 2 pole-3 wire, grounding, w/mounting screws
- \_\_\_\_\_ Screws, #10 X 3/4" hex head
- \_\_\_\_\_ Switch, single pole toggle, w/mounting screws
- \_\_\_\_\_ Switch, three-way toggle, w/mounting screws
- \_\_\_\_\_ Switch, four-way toggle, w/mounting screws
- \_\_\_\_\_ Switch, double pole, 20 amp, 120/277 v, w/mounting screws
- \_\_\_\_\_ Clip, grounding box
- \_\_\_\_\_ Grounding pigtail with grounding screw
- \_\_\_\_\_ Grounding pigtail without screw
- \_\_\_\_\_ Staple, NM cable
- \_\_\_\_\_ Connector, yellow, solderless
- \_\_\_\_\_ Connector, red, solderless
- \_\_\_\_\_ Connector, green grounding
- \_\_\_\_\_ Electrical Tape - Black
- \_\_\_\_\_ Electrical Tape - Red
- \_\_\_\_\_ Electrical Tape - White

Revised 7/3/18

**FFA/EMC Speech Demonstration Scoring Rubric**

Oral Communication (600 Points)	Indicators	Very strong evidence of skill is present (5-4 points)	Moderate evidence of skill is present (3-2 points)	Strong evidence of skill is not present (1-0 points)	Points Earned	Weight	Total Score
<b>Knowledge</b>	<b>Demonstrate understanding of the assigned problem</b>	Students introduces themselves and clearly states the assigned problem.	Students introduces themselves but statement of assigned problem demonstrates a lack of complete understanding.	No clear introduction or no clear understanding of assigned problem.		x 15	
	<b>Logical sequence of events</b>	Student follows a logical method of explanation throughout the problem which includes selection and installation of materials.	Student follows a somewhat logical sequence however the sequence is difficult to follow indicating a lack of complete understanding of method or procedure.	No clear or logical sequence of events. Presentation demonstrates a complete lack of knowledge and understanding.		x 15	
	<b>Technical knowledge (vocabulary/terminology)</b>	Student accurately connects and articulates technical knowledge and operating principles to practical application using appropriate electrical terms/theory.	Student accurately connects and articulates technical knowledge/operating principles to practical application. Some terms/vocabulary used improperly or some technical errors evident.	Vocabulary does not support an understanding of technical knowledge or understanding of operating principles and installation.		x 15	
	<b>References (NEC, other)</b>	Provided references are used effectively and support students explanation of the problem.	Use of provided references are vague or not used appropriately to support main points.	No references used.		x 15	
<b>Communication</b>	<b>Speaking without hesitation</b>	Never has the need for unnecessary pauses or hesitation when speaking.	Speaks effectively but sometimes hesitates. Occasionally has the need for a long pause or moderate hesitation when speaking.	Frequently hesitates or has long, awkward pauses while speaking.		x 15	
	<b>Detail oriented</b>	Provide well organized details which support the key concepts of the assigned problem.	Some details provided but not all key concepts are thoroughly explained.	Details lacking or overlooks details that could support the problem.		x 15	
	<b>Voice - tone, pitch, volume, pace, etc...</b>	Speaks at the right volume and pace to be clear, with pitch and tone used effectively to emphasize points.	Speaks at the right pace most of the time but shows some nervousness. Pitch, volume, and tone are used occasionally to emphasize points.	Has difficulty using appropriate tone and volume. Pace is too fast/nervous.		x 15	
	<b>confidence, articulate, grammar, pronunciation</b>	Displays confidence and proper articulation, grammar, and word pronunciation.	Pronunciation of words is sometimes vague. Occasional use of incorrect grammar.	Lack of confidence evident. Pronunciation of words is difficult to understand or unclear. Consistent use of improper grammar.		x 15	
<b>Non-Verbal Communication (400 Points)</b>							
<b>Utilization of Materials</b>	<b>Use of materials, tools, references, etc...</b>	Effectively uses all necessary materials, tools, and references provided.	Occasional use of materials, tools, and references to support presentation.	Materials, tools, and references not used.		x 15	
	<b>Organization of materials</b>	Organization and use of materials facilitates an effective and logical presentation/demonstration of the assigned problem.	Materials are somewhat organized but do not completely follow a logical sequence.	Organization of materials is not evident.		x 15	
<b>Communication</b>	<b>Poise</b>	Posture and movement effectively demonstrate confidence, composure, dignity, and command of the audience.	Speakers occasionally lack composure and appear uncertain at times.	Speakers lack composure and consistently appear uncertain.		x 10	
	<b>Attention/eye-contact</b>	Student effectively uses eye contact to communicate and engage the entire audience.	Eye contact is used at inappropriate times or is inconsistent with the logical flow of the presentation.	Eye contact is not evident.		x 10	
	<b>Gestures/mannerisms</b>	Student gestures and mannerisms are not distracting and are used to effectively enhance the presentation and engage the audience.	Gestures and mannerisms are used but occasionally distract from the presentation. Gestures and mannerisms are used occasionally to provide emphasis.	Hands are not used for emphasis, motions are distracting. Lacks positive body language.		x 10	
<b>Appearance</b>	<b>Official FFA Attire</b>	Student is appropriately dressed based on the guidelines outlined in the most recent edition of the Official FFA Manual.			100 Points All or None		
					<b>Gross Total Points</b>		
<b>Time Limit (4 - 6 minutes)</b>			*Deduction of 1 point per second over 8 minutes and 1 point per second under 6 minutes.		<b>Time Deduction*</b>		
<b>Total Possible Points (1000 Points)</b>					<b>Net Total Points</b>		
					<b>Score**</b>		
					**Total Score is Net Total Points divided by 100		

CONTESTANT NO.		STATE EMC/FFA WIRING PROBLEM SCORECARD		TOTAL SCORE	
TIME	POINTS	SCORE	BRANCH CIRCUIT	POINTS	SCORE
60 MIN - 60 PTS. 80 MIN - 20 PTS. 65 MIN - 50 PTS. 85 MIN - 10 PTS. 70 MIN - 40 PTS. 90 MIN - 0 PTS. 75 MIN - 30 PTS.			1. Proper use of 2 or 3 wire cable	<u>50</u>	_____
			2. Wire straight and parallel to surface	<u>20</u>	_____
			3. Staples properly used	<u>20</u>	_____
TOTAL MINUTES _____			4. Cable box connectors used properly	<u>20</u>	_____
Incomplete problem will receive a "0" for time	60	_____	5. No insulation cut outside/inside boxes	<u>50</u>	_____
Workability of assigned problem	50	_____	6. Switch, outlet and light boxes properly located, mounted straight and tight	<u>40</u>	_____
Assigned problem wired correctly	50	_____	7. Correct size of fixture boxes	<u>50</u>	_____
Efficient use of wire and other materials	30	_____	8. Correct cover plates	<u>30</u>	_____
Wore safety glasses while completing assigned problem	10	_____	9. Devices properly mounted in boxes	<u>30</u>	_____
Appropriate tools used properly	10	_____	10. Correct kind of switches	<u>40</u>	_____
<u>SERVICE ENTRANCE</u>			11. Correct kind of receptacle	<u>20</u>	_____
1. Service Entrance cable straight, flat/parallel to surface	<u>5</u>	-----	12. Bond wire used properly	<u>50</u>	_____
2. Service Entrance cable strapped properly	<u>5</u>	-----	13. Wire folded neatly inside boxes	<u>10</u>	_____
3. Service Entrance Cable-box connectors properly used (tight, nut on correctly, clamped correctly, cable properly fitted into connector)	<u>5</u>	_____	14. Six inches free conductor in switch, outlet and light boxes	<u>30</u>	_____
4. Insulation of cable properly removed (Service Entrance & Branch Circuit)	<u>20</u>	_____	15. Insulation 1/2" or less inside boxes	<u>10</u>	_____
5. Service Entrance cable conductors properly attached to the correct service entrance terminals	<u>30</u>	_____	16. Identified terminals correctly used		
6. Service Entrance cable proper length inside panel	<u>10</u>	_____	a. Switches		
7. Service Entrance Panel Properly Bonded Bonding Conductor routed through proper hole	<u>30</u>	_____	_____	Total	
8. Branch Circuit cable correct size (for assigned problem)	<u>20</u>	_____	b. Receptacles	30	
9. Circuit Breaker correct size	<u>20</u>	_____	c. Lamp	Points	
10. Branch Circuit wires properly connected (Black, white, bonding)	<u>30</u>	_____	_____	<u>30</u>	_____
11. Conductors fitted inside panel	<u>6</u>	_____	17. Used white wire correctly (as identified conductor)	<u>50</u>	_____
12. N.M. Cable properly attached to service entrance panel (by cable connector)	<u>4</u>	_____	18. Hooks made and used properly	<u>20</u>	_____
13. Knockout holes properly plugged	<u>5</u>	_____	19. Splicing devices correct size, tight on wire and free from exposed bare wire	<u>20</u>	_____
COLUMN TOTAL	<u>400</u>		20. Knockout holes properly plugged	<u>10</u>	_____
			COLUMN TOTAL	<u>600</u>	
				<b>Score = <u>Total Points X 60</u></b>	
				<b>1,000</b>	

## EXAMPLE PROBLEM SOLVING QUESTIONS

Examples of problem solving questions and wiring diagrams from past competitions can be found on the Georgia Agricultural Education Web site: <http://aged.ces.uga.edu/>

## AGRICULTURAL ELECTRIFICATION (EMC) NEWS RELEASES

Agricultural Electrification (EMC) news releases can be found on the Georgia Agricultural Education Curriculum Resource and Reference CD. Click on the FFA button, and then scroll down until you find the news release you need for the occasion.

## EMC/FFA CAREER DEVELOPMENT EVENT *GEORGIA EMC*

### AWARDS

#### Area Career Development Event

1 <sup>st</sup> Place – Individual	\$500.00 Scholarship & Plaque
2 <sup>nd</sup> Place – Individual	\$300.00 Scholarship & Plaque
3 <sup>rd</sup> /4 <sup>th</sup> /5 <sup>th</sup> Place – Individual	Plaques
1 <sup>st</sup> Place – Advisor	\$100.00 & Plaque
1 <sup>st</sup> Place – Chapter	Plaque
2 <sup>nd</sup> Place – Chapter	Plaque

#### State Career Development Event

1 <sup>st</sup> Place – Individual	\$1,000.00 Scholarship & Plaque
2 <sup>nd</sup> Place – Individual	\$750.00 Scholarship & Plaque
3 <sup>rd</sup> Place – Individual	\$500.00 Scholarship & Plaque
4 <sup>th</sup> – 12 <sup>th</sup> Place – Individuals	State Finalist Plaques
1 <sup>st</sup> Place – Advisor	\$250.00 & Plaque



# Georgia EMC

A Touchstone Energy® Partner



Congratulations on earning a scholarship in the area and/or state EMC/FFA Wiring Contest. Your scholarship is good at the college, university or vocational institution of your choice.

To receive your scholarship, Georgia Electric Membership Corporation (Georgia EMC) must receive:

- 1) Verification of your enrollment from the registrar's office at your school.
- 2) The address of the financial aid office and person to which the scholarship check should be sent.
- 3) Your home address or email address.

Georgia EMC then issues a check to your school, where the funds will be administered by the financial aid office.

Please mail, email or fax verification of enrollment to the attention of Gale Cutler:

Georgia EMC  
PO Box 1707  
Tucker, GA 30085-1707

*gcutler@georgiaemc.com*

Or fax to: (770) 270-6995

The scholarship must be used by within five years or it is forfeited.

Should a student opt to enter the military directly from high school the student should contact Georgia EMC to apprise them of this within the 5-year grace period and we will put their scholarship "on hold" until their discharge from military service.

Georgia's electric cooperatives are pleased to sponsor this program to recognize and reward the outstanding achievements of our state's young people.