

## Evaluation Report

# NC 4-H Electric Congress: A Snapshot

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## EVALUATION SUMMARY

The Sixty-first North Carolina 4-H Electric Congress, an annual three-day youth conference focused on teaching about electric energy and conservation, met at UNC-Asheville from July 14-16, 2008. Youth participants surveyed reported significant gains in knowledge and aspirations to use their learning about electricity, safety, and energy conservation. Several shared positive comments about their experience at the conference.

### What we know and science and technology learning

Science, Technology, Engineering, and Mathematics (STEM) are critical skills for home, work, and civic life in the 21<sup>st</sup> century (National Academy of Sciences, 2007). Committee Extended learning opportunities augment school learning, build specialized expertise, and inspire youth to consider STEM careers (Bell, Lewenstein, Shouse, & Feder, 2009). Opportunities for recognition of science projects and for networking with scientists and science-oriented youth offer further incentives to pursue science learning. However, impacts of science conferences such as NC 4-H Electric Congress are sparsely reported. Moreover, although NC 4-H Congress holds a strong reputation by anecdotal reports, a more extensive feedback process was needed to enable youth and adult participants to share their perceptions with conference planners.

### How was the study done

Youth and adult participants in the three-day conference completed a two page end-of-conference survey asking for their perceptions on activities and outcomes. Youth are selected for 4-H Electric Congress, up to five per county, based on completion of a record book and other significant educational and service activities in the Electric project. One hundred thirty four participants from 60 counties, ages 11-17, shared in workshops on understanding electricity, making electrical devices, energy savings and alternatives, received awards for exceptional projects, and enjoyed networking opportunities with peers and adult leaders. Awards for cumulative electric record books were given to three youth in each electric provider regions—Progress Energy, Duke Energy, and Dominion NCP—as well as to overall winners in Senior (16-18 years) and Junior (13-15 years) categories. A variety of social activities fostered fun and fellowship among youth from all corners of the state. Seventy-four percent of participants had attended Electric Congress for 1-2 years; 15% for 4-6 years, 8% for 5 or more years. A majority of the 134 youth delegates completed the outcome evaluation (N = 122).

Sixty-six adults also attended the conference and 53 completed an outcome evaluation. Many adults chaperone the event every year, with only 25% reporting 1-2 years experience, 7% with 3-4 years, and 22% with 5 or more years of experience. However, a large number of adult respondents did not indicate their experience.

### **What youth and volunteer leaders said about Electric Congress**

***Impact on Knowledge.*** After just three days, about one in five youth reported learning “a lot more” about citizen decision-making on electrical power (28%), how electricity works (25%), safety (24%), problem solving (23%), and renewable energy (21%). A majority added “a little more” to their knowledge of electricity, with fewer gaining a similar amount on renewable energy (46%), problem solving (45%), and citizen decisions (41%). Most participants increased their knowledge of energy concepts and issues and their motivation to continue work in that field. Learning experiences clearly reinforced and extended lessons learned in 4-H Electric projects. Adults reported approximately the same patterns of new learning.



***Impact on Aspirations.*** Brief conferences such as NC 4-H Electric Congress serve first to inspire, then to instruct. Over 80% of Electric Congress delegates were inspired to *learn more about electricity* (90%) and to *solve new problems* (91%). Most planned to *teach peers about renewable energy* (89%) and *teach peers about electricity or electronics* (86%) intended to *seek new problems to solve* (87%). Nearly all planned to *use safety practices* (86%) including safety in soldering. Over ninety percent intended to recruit others to join in electric projects. Adults reported slightly higher levels of aspiration, with more than 90% indicating plans to teach electricity and renewable energy topics.

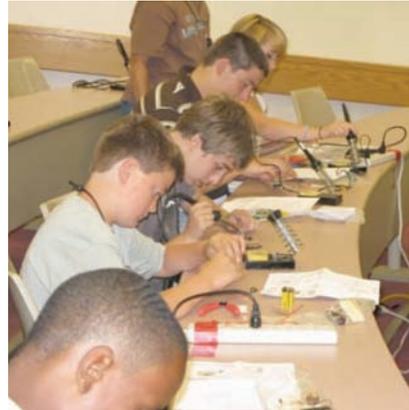
Youth comments indicated a wide range of intentions for future learning in both understanding electricity (making a light bulb, wiring a lamp, testing voltage, advanced circuits) and learning about renewable/alternative energy (solar, wind, hydroelectric, and nuclear). Several mentioned safety practices with electricity and soldering irons in their plans for continued learning.



***Views of Conference Components.*** Youth viewed all elements of Electric Congress quite positively. Educational activities received the highest ratings, as more than 70% rated Electric Project Kit, Electric Energy Activity, and Renewable Energy Activity as “Pretty Cool” or “Fantastic.” A recreational trip to whitewater rafting was enthusiastically received, as were trips to the Biltmore Estate, movies and games, a dance, and a banquet. The awards ceremony, picture-taking, and vespers were positively rated, as were accommodations

at UNC-Asheville, registration, and transportation. The only problems identified were poor air conditioning in some rooms (6%) and poor food choices (14%). Many youth were tired by the busy pace of the conference.

Conference participants were not surveyed about the youth development climate at Electric Congress, but several youth and adult comments, as well as the positive tone of ratings on learning and activities suggest that the conference created a positive environment. Quality of program climate is critical to achievement of positive learning and development outcomes for youth. Thus evidence that the climate was safe, supportive, and skill-building supports the conclusion that positive outcomes resulted from experiences at the event.



### **Lessons Learned and Recommendations**

North Carolina 4-H Electric Congress is a highly-regarded and desired learning and recreational opportunity with over sixty years of support from energy companies, NC State University, and Cooperative Extension agents. Youth participants, ranging in age from 11 to 18 gain knowledge, networking and friendship opportunities, recognition for project work, and recreational and cultural experiences that enrich their development. Varied topics and levels of workshops, as well as hands-on learning and opportunities for interaction with peers and experts seem to fit the diverse experience and interests of participants. Most youth and adults leave the conference motivated to apply and share their knowledge and recruit more youth into the Electric Project. Adults, whether first-year chaperones or veterans of a decade or more, report that they also learn more about electricity, renewable energy, and how to teach activities. The ambitious routine in a campus environment is positively received, no small feat for an event serving such a diverse audience. Despite multiple complaints of fatigue, a common recommendation is that the conference be extended for 4-7 days.

Participation in the conference was marginally lower in 2008 than in previous years. Asheville is a less central and convenient location. However, Electric Congress is typically a highlight for the year. Conference planners may want to poll adult leaders for preliminary feedback on sources of this trend and ways to increase participation in coming years.

Electric Congress staff evaluation capacity and performance improved over the past two years as more extensive and complete feedback was gathered and formally reported. The pace of the conference and focus on activity over reflection is inhospitable to survey methods. The number and quality of data and comments gathered at the 2008 Electric Congress indicates that conference coordinators handled those challenges well. Several steps might enhance the quality of feedback available to conference planners: (1) Inclusion of enrollment data in the overall database, to facilitate comparisons between groups (e.g., gender, age, experience); (2) use of pre-assessments to index experience of incoming participants, and (3) post-assessments to track skill growth and application; (4) use of the Youth Program Climate survey (as in 2007) to confirm program quality; (5)

training and engagement of expert observers to document mastery and application of inquiry processes; and (6) use of off-site focus groups with first-year and multi-year participants to expand local applications of Electric Congress lessons. Generations of anecdotal reports recommend 4-H Electric Congress as a singular learning and social development activity. Additional program and evaluation enhancements would thoroughly document practices and results. Such reports would prove valuable in expanding the Electric Program statewide and facilitating adoption of similar programs nationwide.



## References

Bell, P., Lewenstein, B., Shouse, A.W., & Feder, M.A. (2009). *Learning science in informal environments: People, places, and pursuits*. Washington, DC: National Academies Press.

National Academy of Sciences. (2007) *Rising above the gathering storm*. Washington, DC: National Academies Press.

**Support:** NC 4-H Electric Congress is sponsored by North Carolina energy companies, including Progress Energy, Duke Power, and Dominion NC Power who sponsor delegates and awards to high-achieving 4-H Electric Project participants

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