



Real-Time Intelligence for Smart Electric Grid Operations

NSF Industry/University Cooperative Research Center

Clemson University &

Georgia Institute of Technology



Dear RISE Prospective Member,

Conceiving of, designing, and implementing effective and evolving information technology, control, communication, and computer technologies for enabling a sustainable smart grid is not a matter of simply adding on or making minor modifications to the existing electric grid operation and control practices. It rather requires an in-depth understanding of the electric power system operating as a super system that contains independent, complex systems interacting among themselves to achieve the common goal of efficient and reliable electric energy 'make-move-use.'

The future energy delivery system requires flexibility in order to supply reliable energy with adequate power quality at the lowest cost to the consumer. It is clear that real-time operations and control technologies will adapt and evolve to distributed network control to increase the flexibility of the electric energy system. To develop this future electric grid, a new "mega-infrastructure" system of systems must emerge from the convergence and amalgamation of a physical power system, information and communication system, cyber-security, and electricity market system.

The National Science Foundation has approved the RISE concept as unique in the nation, and invited the team to hold a planning meeting to prepare a full center proposal. We hope your industry is excited about the RISE center, and is able to participate in the planning meeting and hopefully become a founding member of the RISE center. Upon request we can provide more information to learn about the RISE Center, upcoming planning meeting and joining the RISE Center. We invite you to *RISE with US*.

Sincerely,

G. Kumar Venayagamoorthy

On behalf of RISE

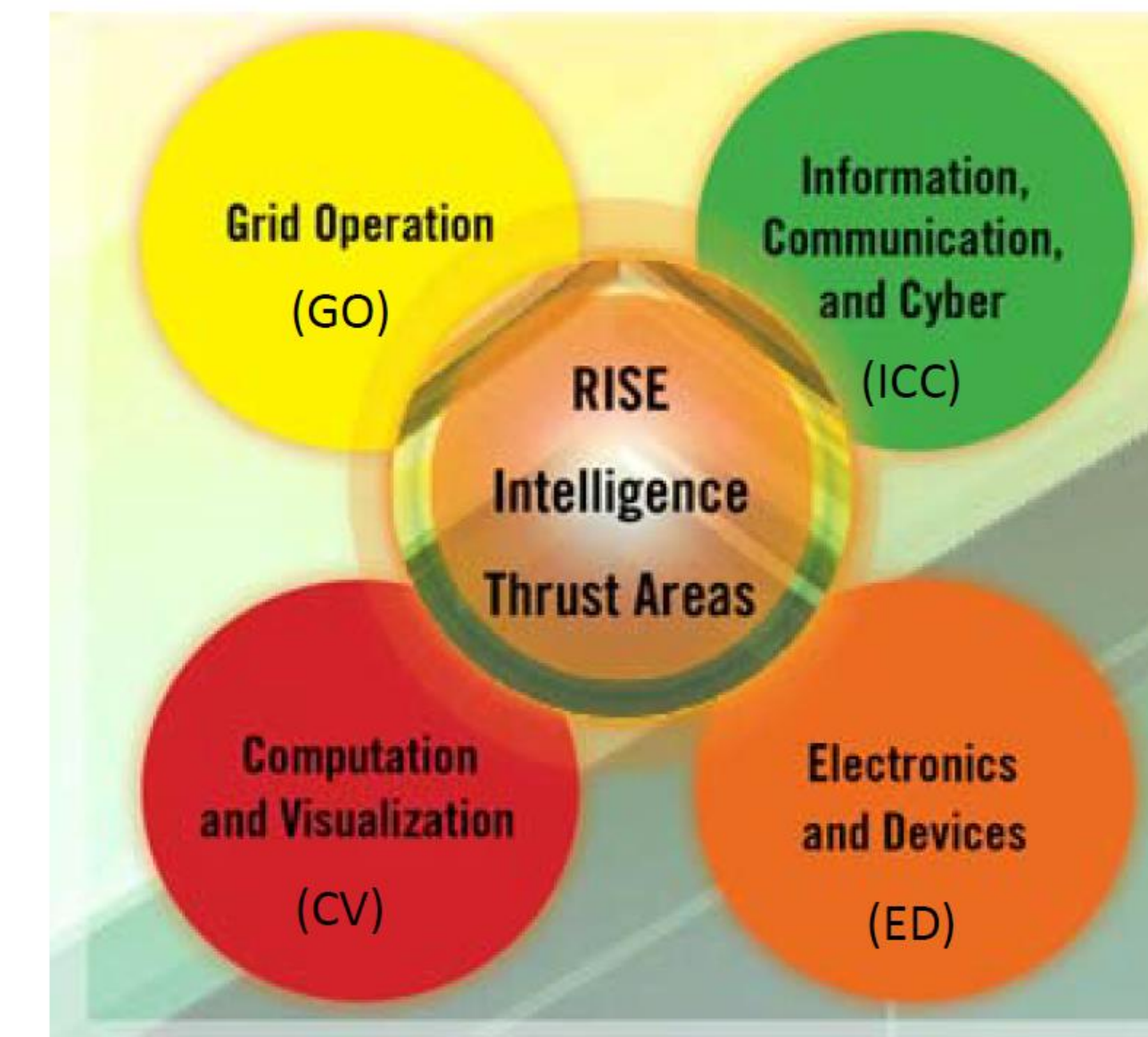
RISE Vision & Mission

The *RISE vision* is the creation of a flexible, resilient, cost-effective and sustainable electricity infrastructure, from generation to end-user operations.

The mission of the center on Real-Time Intelligence for Smart Electric Grid Operations (RISE) is to define, initiate and accelerate the transformation of electricity infrastructure operations end-to-end to fulfill the goal of dramatically improved grid reliability, resiliency, efficiency and sustainability leading to lower cost of energy delivered. This requires the evolution of a new operating paradigm for the new electric energy industry, academe, and government.

The *RISE Mission* will be accomplished by focusing on the following main objectives:

- To develop an end-to end grid operational system of systems architecture with emphasis on the Integration of power system, communication and information systems, computational systems, cyber systems, market systems, and policy
- To develop scalable grid intelligence (end-to-end) for real-time operations
- To develop real-time dynamic energy management systems
- To educate the next generation of system engineers who understand the interdisciplinary nature of the new electric energy industry important to member companies.



The *RISE Thrusts* are:

GO Thrust: Real-Time Power Systems: Computation, Control, Devices, Economics, Intelligence Instrumentation and Measurements, Modeling, Operations, Optimization, Policy, Protection, Simulation, Stability, and Sustainability

ICC Thrust: Cyber Security, Communication, Computational Networks, Control and Estimation, Intelligence

CV Thrust: Computing Paradigms and platforms, Data and Visualization, Analytics, Information Technology, Intelligent Systems, Real-Time Systems

ED Thrust: Active Assets, Electric Machines, Energy Storage, Electric Vehicles, Power Electronics, Renewable Energy Sources

RISE Faculty Directory



Dr. Richard Brooks, Clemson University



Dr. Marilyn Brown, Georgia Tech



Dr. Keith Corzine, Clemson University



Dr. Shijie Deng, Georgia Tech



Dr. Ronald Harley, Georgia Tech
Site Director



Dr. Simona Onori, Clemson University



Dr. Maryam Saedifard, Georgia Tech



Dr. Rajendra Singh, Clemson University
Site Director



Dr. Melissa Smith, Clemson University



Dr. G. Kumar Venayagamoorthy,
Clemson University,
RISE Executive Director



Dr. Kuang-Ching Wang, Clemson University



Dr. Zach Wartell, UNCC



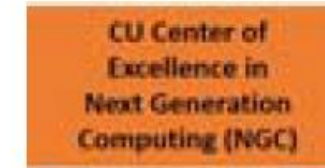
RISE WITH US

RISE Centers and Laboratories

Battery Aging and Characterization Lab at Clemson University:
International Center for Automotive Research (CUICAR)
<http://cuicar.com>



Clemson University Center of Excellence in Next Generation
Computing (NGC) <http://citi.clemson.edu/viz>



Clemson University SCE&G Energy Innovation Center
<http://clemsonenergy.com>



Clemson University Real-Time Power and Intelligent Systems
(RTPIS) Laboratory <http://rtpis.org>



Georgia Institute of Technology National Electric Energy Testing,
Research, and Applications Center (NEETRAC)
<http://www.neetrac.gatech.edu/>



The Charlotte Visualization Center at UNCC (VisCenter)

<http://viscenter.uncc.edu>



More details on RISE available from:

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RISE Executive Director

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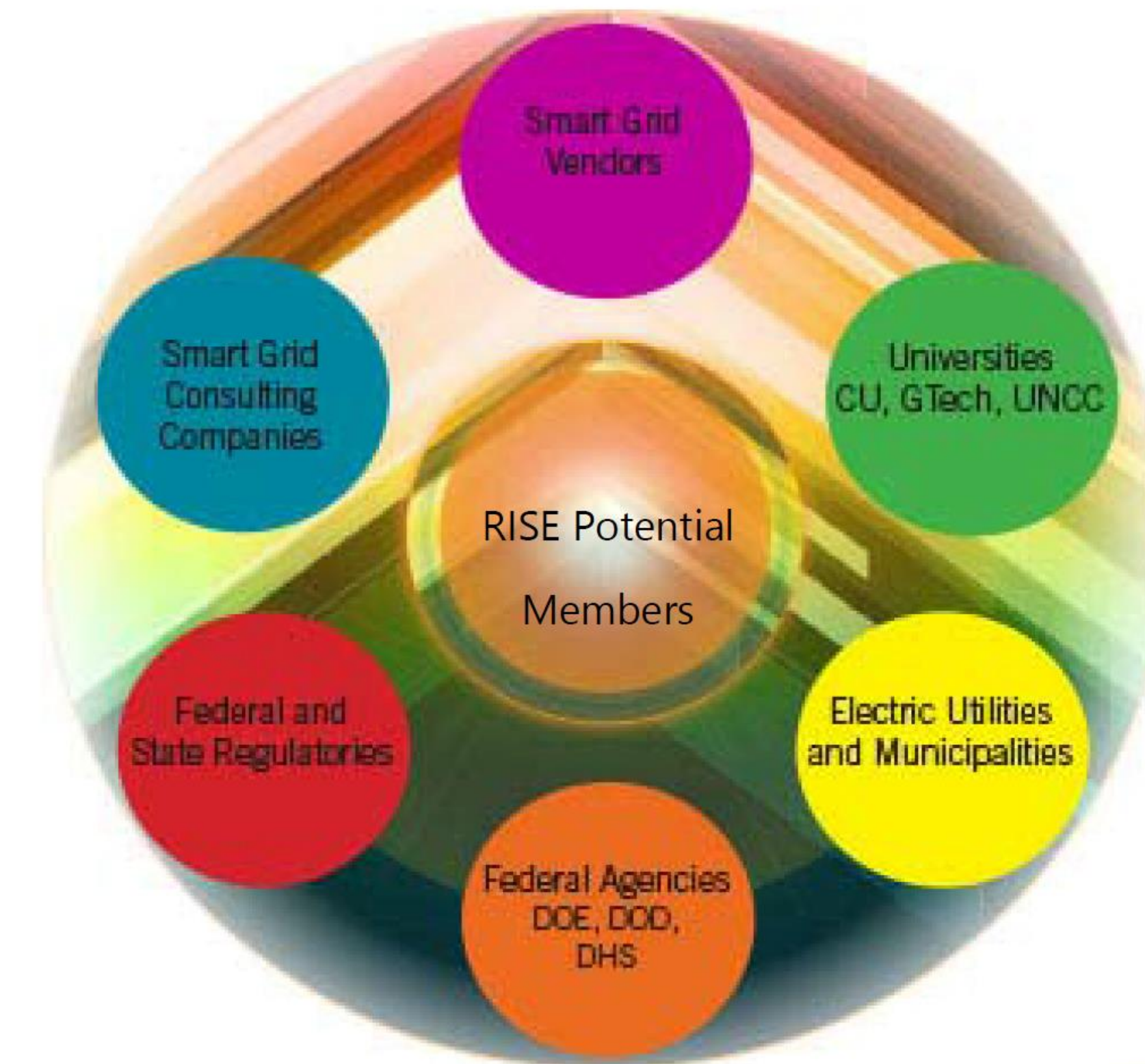
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<http://risewithus.org>

Why RISE With Us?



Membership of the center is through an annual fee for a minimum of two years. Industry membership will consist of diverse companies such as utilities, vendors, government agencies, and national laboratories from different disciplines in the scope of this center.

- All center members will have an opportunity to propose specific research problems, case studies, and focus areas for research.
- Leading-edge cost effective research projects jointly developed by university experts and Industry leaders.
- All center members will have the opportunity to contribute to RISE research, education, and innovation-ecosystem by serving as dissertation/thesis committee members and industrial mentors, as appropriate and consistent with the policies and procedures of the participating institutions.
- Additional benefits may be established in bylaws approved by the Board of Directors.