We’re harnessing the power of data analytics to unlock previously unrealized opportunities in the energy sector.

At Case Western Reserve University, Director of the SDLE Research Center Roger French has built a ground-breaking platform which is taking traditional reliability testing into a new scientific frontier. The platform, known as Energy Data Science (EDS), utilizes three tenets: an epidemiological approach, big data analytics and predictive modeling. Using state of the art facilities in the SDLE Center, our faculty and students are working to improve building energy performance and to extend the lifetime of critical energy materials.

**Strengths and Assets**
- 192 terabyte high-performance computing cluster
- One-acre outdoor exposure research facility
- Structural equation modeling to map degradation pathways
- Conducting multi-generational product studies using big data
- Connecting real-world data to accelerated test results
- Ingesting and analyzing massive amounts of data
- Open source software
- Assessing products from various perspectives - materials, components and systems level studies
- Demonstrated success with numerous longstanding partners
- Studying diverse and complex sample populations

**Opportunities**
- Safety critical applications
- Products and systems with long lifespans
- Technologies with a high cost or risk of failure
- Edge devices and advanced metering infrastructure

**Partner Benefits**
- Longer product lifetime
- Reduced warranty risk
- Improved process for design and deployment
- Better performance information
- Enhanced decision making capabilities
- Cost savings through reduced energy consumption
“Q-Lab Corporation has a great relationship with the SDLE Center. Not only is the work they do very highly respected, Professor Roger French and his team are extraordinarily responsive and easy to work with.”

— Sean Fowler, Technical Marketing Specialist at Q-Lab

CURRENT RESEARCH PROJECTS

**Solar**

Module Level Exposure and Evaluation Test for Real-world and Laboratory-based Photovoltaic Modules: Common Data and Analytics for Quantitative Cross Correlation and Validation  
Technical Lead: Roger French

Photovoltaic Backsheets: Correlation of Long-Term Field Reliability with Accelerated Laboratory Testing  
Technical Lead: Laura Bruckman

Network Modeling for Rapid Optimization of Lifetime, Efficiency and CapEx of PERC Solar Cells  
Technical Lead: Roger French

Reliability and Power Degradation Rates of PERC Modules Using Differentiated Packaging Strategies  
Technical Lead: Roger French

**Building Energy Efficiency**

Lifetime and Degradation Science of Coated Fly-Ash Loaded Polyurethane: a Degradation Mechanism and Pathway Focus  
Technical Lead: Laura Bruckman

Data Analytics for Virtual Energy Audits and Value Capture Assessments of Buildings  
Technical Lead: Alexis Abramson

**Cross Cutting Topics in EDS**

Rapid Qualification of New Fossil Energy Alloy Materials Aided by Data Analytics  
Technical Lead: Jennifer Carter

Lifetime and Degradation Science Studies of Architectural, Protective and Marine Coatings  
Technical Lead: Laura Bruckman

Interested in working with the Energy Data Science platform? Contact Chris Littman, business development director and operations manager of SDLE, at 216.368.0374 or christopher.littman@case.edu.

[energy.case.edu/research/energy-data-science](http://energy.case.edu/research/energy-data-science)