Energy Data Science

DATA ANALYTICS FOR INFORMED DECISION MAKING

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

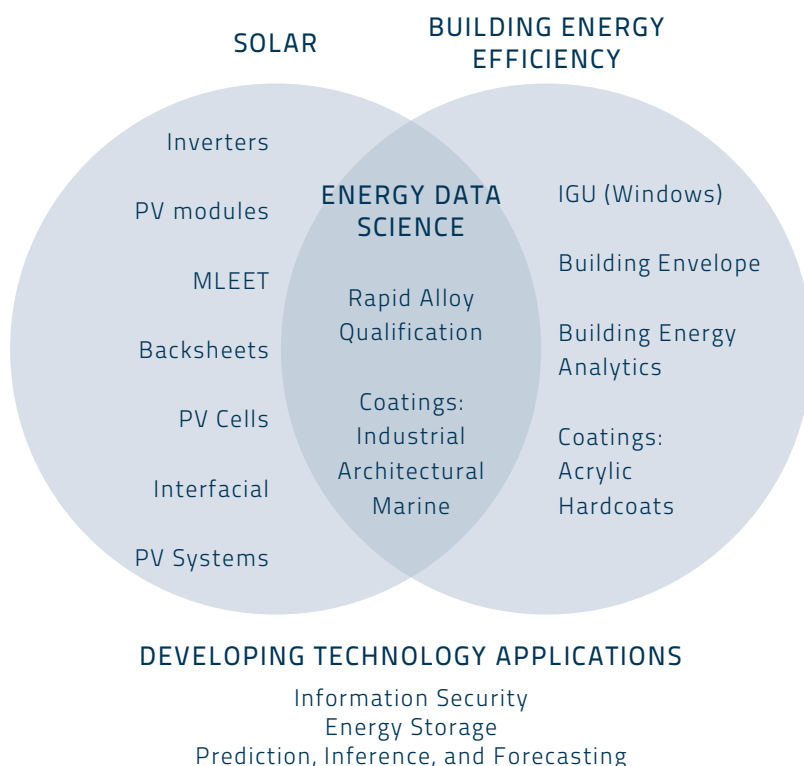CASE WESTERN RESERVE
UNIVERSITY ___ EST. 1826
think beyond the possible℠

Lifetime and Degradation Science
A New Scientific Discipline

"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

SOLAR

BUILDING ENERGY EFFICIENCY

Inverters

PV modules

MLEET

Backsheets

PV Cells

Interfacial

PV Systems

ENERGY DATA SCIENCE

Rapid Alloy Qualification

Coatings:
Industrial
Architectural
Marine

IGU (Windows)

Building Envelope

Building Energy Analytics

Coatings:
Acrylic
Hardcoats

DEVELOPING TECHNOLOGY APPLICATIONS

Information Security
Energy Storage
Prediction, Inference, and Forecasting

CURRENT RESEARCH PROJECTS	TECHNICAL LEAD
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	Roger French
Photovoltaic Backsheets: Correlation of Long-Term Field Reliability with Accelerated Laboratory Testing	Laura Bruckman
Network Modeling for Rapid Optimization of Lifetime, Efficiency and CapEx of PERC Solar Cells	Roger French
Reliability and Power Degradation Rates of PERC Modules Using Differentiated Packaging Strategies and Characterization Tools	Roger French
Building Energy Efficiency	
Lifetime and Degradation Science of Coated Fly-Ash Loaded Polyurethane: a Degradation Mechanism and Pathway Focus	Laura Bruckman
Data Analytics for Virtual Energy Audits and Value Capture Assessments of Buildings	Alexis Abramson
Cross Cutting Topics in EDS	
Rapid Qualification of New Fossil Energy Alloy Materials Aided by Data Analytics	Jennifer Carter
Lifetime and Degradation Science Studies of Architectural, Protective and Marine Coatings	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

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