

Grant Title	Recipient Organization	Project Summary
Shared uPMUs for Data-Driven Real-Time Distribution Monitoring, Modeling and Analysis	Iowa State University	Demonstrate the usefulness of uPMUs in MidAmerican systems and provide big data tools for analysis.
Distributed Solar and Wind Power Generation Planning in Rural and Underserved Areas	Iowa State University	Plan for distributed rural solar and wind units with economics, efficiency and sustainability.
Toolkit for Identification, Characterization and Energy Evaluation of Low-Efficiency Rural Housing	Iowa State University	Toolkit to identify least energy efficient homes and motivations for efficiency investments.
Utility Workforce Assessment and Strategy Planning	University of Northern Iowa	Identify issues and develop a plan to impact current and future talent pipeline.
Development of Low Cost, Safe and High-Performance Sodium Batteries for Wind Energy Storage	Iowa State University	Sodium batteries will be developed to cheaply and safely store wind energy to reduce the cost and increase the reliability of electricity.
Wind Turbines in Cold Winter	Iowa State University	Study wind turbine icing physics and develop novel anti-/de-icing strategies to protect Iowa wind turbines in cold winter.
Strategies for Building Soil Carbon and Generating Carbon Negative Energy in Iowa Counties	Iowa State University	Advances renewable natural gas and power production using Iowa waste resources.
A New Paradigm to Solve Unit Commitment and Optimal Power Flow Problems	Iowa State University	Dispatch schedules optimized with realistic constraints will lower the cost of a reliable grid.
Wastewater Case Studies to Prove Ratepayer Benefits in Underserved Iowa Communities	Baldrige Environmental Services, LLC	Prove the affordability of meeting the DNR regulations with civil engineers' oversight while saving energy.
Smart Peak Power Avoidance	Iowa State University	Optimize the operation and management of energy intensive in-barn manure drying systems.
Iowa Rural Energy Planning	University of Northern Iowa	Create workforce development for 20 employees in various energy career fields.
Paired Electrolyzer for Conversion of Crude Glycerin and Waste CO <sub>2</sub>	Iowa State University	Create an electrolyzer powered by renewable electricity for conversion of glycerin & carbon dioxide to valuable chemicals.
Developing an Iowa Energy Curriculum for Secondary Classrooms	University of Northern Iowa	Develop and disseminate an energy curriculum (with career connections) for Iowa secondary students.
Low-Cost Biobased Composite Material for Ultra-Durable and Recyclable Wind Turbine Blades	Iowa State University	Develop low-cost, biobased recyclable turbine blade material with high durability.
An Origami Structural Design for Natural Gas Pipeline Rehabilitation	Iowa State University	Prevent future pipeline leakages using a novel origami design of the liners.

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Iowa Rural Healthcare Micro-Grid Feasibility Analysis	The Energy Group	Analysis of island-able technologies to determine the cost effectiveness of distributed generation.
Grow Energy Workforce Development Program for Rural Iowa Communities	Energy Association of Iowa Schools	Workforce energy training and certification for students and building operators in rural southwest Iowa.
Storing Excess Solar/Wind Electricity as Biorenewable Fuels by Electrocatalytic Biomass Conversion	Iowa State University	Develop a technology to store the intermittent solar/wind electricity as biofuels.
Predicting Battery Lifetime with Early-Life Data for Grid Applications	Iowa State University	Develop and teach a software tool for improving prediction of battery lifetime.
Improve Battery Energy Efficiency via Structural Design and 3D Printing for Electric Vehicles	Iowa State University	Create a novel structure of all-solid-state EV battery and apply 3D printing to manufacture it.
Mobile Power for Rural Wastewater Treatment and Community Resiliency	Baldrige Environmental Services, LLC	Create a mobile power trailer/unit for innovative small town wastewater treatment, powered by solar/battery storage to increase resilience.
Building Enclosure Council of Iowa Educational Programs	Building Enclosure Council of Iowa	The council plans five Building Science educational events per year, including one large event that has multiple subjects.
Developing a Pilot-Scale Business Model for Monetizing Carbon Capture on Solar Energy Farms	Impact 7G	Create a business model for monetizing carbon capture on utility-scale solar energy farms on reclaimed land.
GIS Tool to Plan Mitigation and Recovery of Gridlines Under Natural Hazards to Improve Resiliency	Iowa State University	Develop a geographic information system (GIS) mapping tool for planning mitigation and enhancing situational awareness of power utilities.
Artificial Intelligence-Assisted Robotic Mapping of Underground Infrastructure	Iowa State University	Develop an AI-robot platform to automate mapping of underground infrastructure.
From the Landfill to the Grid: Repurposing Used Batteries for Resilient Grid Storage	Iowa State University	Refurbish spent lithium-ion batteries for second-life applications on the electric power grid.
Control and Coordination of Solar+Storage for Enhanced Resiliency	Iowa State University	Enhance grid resiliency by control of solar plants/devices with storage.
Micro-DERMS: DERMS for Real-Time Monitoring and Control of Mobile Microgrids and DER Distribution Grid	Iowa State University	Develop a cost-effective technology to integrate renewables into utility data systems.
Advanced 3D Optical Sensing and Peening Technologies for Crack Mitigation in Natural Gas Pipelines	Iowa State University	Develop a pre-service inspection and crack mitigation solution for gas pipelines.
Electrical Energy from Ethanol	University of Iowa	Create electricity from ethanol by creating low cost, scalable ethanol fuel cell systems.
Modeling Solar Radiation Potential and Urban Heat Utilizing Mobile Sensors and Topographic Data	University of Northern Iowa	Create detailed solar radiation and urban temperature maps across Iowa with web-based dissemination.
Driving Electric in Rural NE Iowa: An Analysis, Planning, Workforce and Major Employer Partnership	Winneshiek Energy District	Create an EV prosperity collaborative for communities, employers, workers and individuals in northeast Iowa.

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Recycling of Used and End-of-Life Li-Ion Batteries to Extract Lithium, Anode and Cathode Materials	Iowa State University	Develop a scalable recycling process for sustainable recover of critical materials from lithium-ion batteries.
Mining Smart Meter Data for Modeling and Mitigating EV Charging Impacts to Distribution Grids	Iowa State University	Model EV charging impacts on distribution systems for better infrastructure planning and operation.
Continuous Thermal to Electrical Harvesting from Industrial and Residential Waste Heat	Legov Systems Group	Scale-up of an energy harvester for continuous operation and pilot scale testing.
Laser Surface Engineering of Natural Gas Pipelines for Extended Service Life	Iowa State University	Develop laser surface engineering technologies to extend pipeline service life.