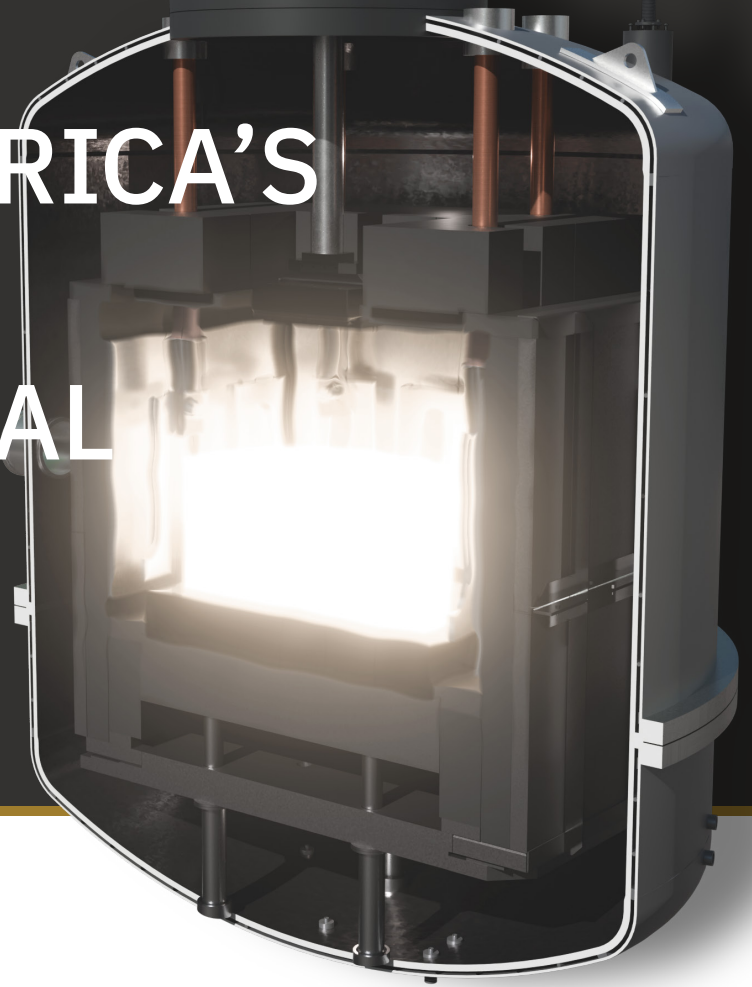


# BUILDING AMERICA'S ENERGY & ENVIRONMENTAL CAPABILITIES



## OUR DIFFERENTIATED APPROACH

Re:Build Manufacturing offers a unique combination of engineering excellence, advanced manufacturing, and U.S.-based production that addresses the most critical challenges facing energy programs.

### END-TO-END ENERGY SOLUTIONS

- Single-source accountability from concept validation through field commissioning
- Integrated capabilities: power systems, controls, fabrication, assembly, testing
- Eliminates multi-vendor coordination challenges and interface risks

### DOMESTIC MANUFACTURING EXCELLENCE

- U.S.-based design, engineering, and manufacturing facilities
- ISO 9001 certified quality management systems
- Secure supply chain with vendor management

### RAPID DEVELOPMENT TO DEPLOYMENT

- Manufacturability for Design™ (MFD) and field serviceability
- Accelerated prototype to production timelines
- Flexible scaling from pilot systems to full production

### MULTI-SECTOR ENERGY EXPERTISE

- Renewable energy systems (solar, wind, hydro)
- Energy storage and battery systems
- Power generation equipment
- Grid infrastructure and smart energy
- Industrial energy systems

# EARLY-STAGE CONCEPT DEVELOPMENT & SYSTEM ENGINEERING

## PROGRAM DEVELOPMENT & SYSTEM ARCHITECTURE

### TECHNOLOGY ROADMAPMING & FEASIBILITY

- Product and technology roadmapping
- Energy system concept and feasibility studies
- Environmental impact and risk analysis
- Technical and economic feasibility assessment
- Market analysis and regulatory landscape evaluation
- Technology gap identification

### PROOF-OF-CONCEPT DEVELOPMENT

- Rapid prototyping for validation
- Proof-of-concept prototype builds
- Trade study analysis execution
- Requirements validation workshops
- Performance demonstrations and testing

### SYSTEM ARCHITECTURE DESIGN

- Systems engineering and architecture development
- Requirements analysis and specification
- Energy system architecture design
- Grid integration and interconnection planning
- Control and power management strategy development
- Communication and monitoring architecture design
- Interface control documents

### INTEGRATION PLANNING

- Component selection and supplier evaluation
- Supply chain architecture and risk mitigation
- Manufacturing strategy and location planning
- Cost modeling and lifecycle analysis
- Preliminary design reviews

# CUSTOM ENERGY GENERATION & STORAGE SOLUTIONS

## POWER ELECTRONICS & BATTERY SYSTEMS

### POWER SYSTEM DESIGN

- Electrical and power system design documentation
- High-voltage and power distribution design
- Power generation system architecture
- AC/DC power conversion systems
- Transformer and switchgear integration
- Cable and interconnection design engineering

### ENERGY STORAGE SYSTEMS

- Battery energy storage system (BESS) design
- Custom battery pack engineering
- U.S.-based battery management systems (BMS)
- Grid-scale energy storage solutions
- Microgrid and distributed energy resources
- Peak shaving and load leveling systems

### RENEWABLE ENERGY INTEGRATION

- Solar PV system design and integration
- Wind turbine component engineering
- Hydroelectric system design
- Hybrid renewable energy systems
- Energy management and optimization
- Renewable energy forecasting integration

### GRID INTEGRATION & SMART ENERGY

- Grid connectivity and smart energy enablement
- SCADA/HMI and energy management system integration
- Utility interconnection engineering
- Demand response systems
- Virtual power plant (VPP) integration
- Distributed energy resource management (DERMS)

### POWER CONVERSION & ELECTRONICS

- Inverter and converter design
- Power conditioning systems
- Harmonic filtering and power quality
- Reactive power compensation
- Maximum power point tracking (MPPT)
- Grid-forming and grid-following inverters

# COMPREHENSIVE ENVIRONMENTAL TECHNOLOGY & EQUIPMENT

## ENVIRONMENTAL SYSTEMS & SOLUTIONS

### ENVIRONMENTAL MONITORING SYSTEMS

- Air quality monitoring equipment design
- Water quality monitoring systems
- Emissions monitoring systems (CEMS)
- Environmental sensor networks
- Real-time data acquisition and reporting
- Compliance monitoring and reporting systems
- Remote sensing and telemetry integration

### EMISSIONS CONTROL & AIR QUALITY

- Emissions control system design
- Scrubbers and pollution control equipment
- Particulate matter capture systems
- NOx, SOx, and VOC reduction technologies
- Carbon capture and sequestration systems
- Flare and thermal oxidizer design
- Stack monitoring and analysis systems

### WATER & WASTEWATER TREATMENT

- Water treatment system design
- Wastewater treatment equipment
- Filtration and purification systems
- Chemical dosing and control systems
- Sludge handling and dewatering
- Water recycling and reuse systems
- Industrial process water treatment

### CLIMATE & SUSTAINABILITY TECHNOLOGIES

- Carbon capture, utilization, and storage (CCUS)
- Greenhouse gas reduction systems
- Industrial decarbonization solutions
- Waste-to-energy systems
- Thermal energy recovery
- Process optimization for energy efficiency
- Circular economy equipment design

### ENVIRONMENTAL PROCESS SYSTEMS

- Chemical processing for environmental applications
- Bioreactor and biological treatment systems
- Advanced oxidation processes
- Ion exchange and membrane systems
- Distillation and evaporation systems
- Solvent recovery and recycling
- Hazardous waste treatment equipment

### REGULATORY COMPLIANCE ENGINEERING

- EPA compliance engineering
- State and local environmental permitting
- Environmental impact assessments
- Compliance documentation and reporting
- Best Available Control Technology (BACT) analysis
- Maximum Achievable Control Technology (MACT) compliance

# INTELLIGENT MONITORING & CONTROL SOLUTIONS

## CONTROL SYSTEMS & AUTOMATION

### CONTROL SYSTEM DESIGN

- PLC, SCADA, and HMI development
- Control system programming and commissioning
- Power management and control strategy verification
- Distributed control systems (DCS)
- Process automation and optimization
- Remote monitoring and control

### SCADA & HMI SYSTEMS

- SCADA system architecture and implementation
- Human-machine interface (HMI)
- Real-time data acquisition and visualization
- Alarm management and notification
- Historical data trending and reporting
- Web-based monitoring portals

### CONDITION MONITORING

- Condition monitoring system integration
- Predictive maintenance algorithms
- Vibration analysis and diagnostics
- Thermal imaging and hotspot detection
- Oil analysis and contamination monitoring
- Performance degradation tracking

### SAFETY & PROTECTION SYSTEMS

- Safety system and protection validation
- Fault detection and isolation
- Emergency shutdown systems
- Arc flash protection
- Ground fault detection
- Cybersecurity implementation

### SENSOR & INSTRUMENTATION INTEGRATION

- Sensor, meter, and monitoring device testing
- Voltage, current, and power measurement
- Temperature, pressure, and flow sensors
- Environmental monitoring (humidity, dust, gas)
- Data acquisition systems
- Wireless sensor networks

# COMPREHENSIVE DESIGN & ANALYSIS SERVICES

## ELECTRICAL & MECHANICAL ENGINEERING

### ELECTRICAL ENGINEERING

- High-voltage system design
- Electrical load analysis and calculations
- Short circuit and arc flash studies
- Cable sizing and routing design
- Grounding and lightning protection
- Power system modeling and simulation

### MECHANICAL DESIGN

- Detailed CAD design models
- Structural design and analysis
- Enclosure and housing design
- Thermal management and fluid flow design
- Mounting and support structures
- Design for manufacturability reviews

### THERMAL MANAGEMENT

- Cooling system design and optimization
- Heat exchanger selection and integration
- Computational Fluid Dynamics (CFD) analysis
- Thermal runaway prevention
- Environmental control systems
- Temperature monitoring and control

### PERFORMANCE MODELING & SIMULATION

- Simulation and performance modeling
- System load, capacity, and efficiency testing
- Computational and simulation validation testing
- Energy yield analysis
- Transient stability studies
- Power flow and voltage analysis

### FIELD SERVICEABILITY ENGINEERING

- Design for field serviceability
- Maintenance access and ergonomics
- Modular design for component replacement
- Diagnostic and troubleshooting features
- Spare parts strategy
- Service documentation and training materials

# HEAVY INDUSTRIAL & PRECISION MANUFACTURING

## ADVANCED MANUFACTURING & FABRICATION

### PROCESS DEVELOPMENT

- Manufacturing process flow development
- Welding and fabrication procedures
- Custom equipment and tooling fabrication processes
- Assembly and integration procedures
- Testing, inspection, and certification protocols
- Critical process parameter definition
- Process capability and qualification studies
- Quality control plan development

### WELDING & FABRICATION

- Structural steel fabrication
- Stainless steel and aluminum welding
- TIG, MIG, and stick welding
- Certified welders (AWS, ASME)
- Weld inspection and non-destructive testing
- Pressure vessel fabrication (ASME compliance)

### HEAVY FABRICATION & ASSEMBLY

- Custom fabrication equipment and tooling design
- Material handling and heavy lift systems
- Large-scale structural assembly
- Skid and frame fabrication
- Piping and manifold assembly
- Equipment mounting and installation

### PRECISION MACHINING

- CNC machining and turning
- Sheet metal fabrication
- Laser and waterjet cutting
- Custom component manufacturing
- Tight tolerance machining
- Surface finishing and coating

### ELECTRICAL ASSEMBLY

- Control panel fabrication and assembly
- Electrical testing and commissioning equipment
- Wire harness manufacturing
- High-voltage cable termination
- Busbar fabrication and installation
- Equipment wiring and testing

### PRODUCTION INFRASTRUCTURE

- Facility layout and production infrastructure planning
- Custom equipment and component procurement
- Material flow and logistics optimization
- Production line setup and commissioning
- Operator training and work instructions
- Quality system implementation

# COMPREHENSIVE VERIFICATION & FIELD DEPLOYMENT

## TESTING, VALIDATION & COMMISSIONING

### DESIGN VERIFICATION TESTING

- Prototype system builds
- Performance analysis and efficiency optimization
- Functional testing and validation
- Load testing and capacity verification
- Environmental simulation testing
- Electrical performance verification

### SYSTEM-LEVEL VALIDATION

- Factory acceptance testing (FAT)
- Site acceptance testing (SAT)
- Performance validation in operational and environmental conditions
- System functional and performance testing
- System reliability and endurance testing
- Integration testing with existing infrastructure

### SAFETY & COMPLIANCE TESTING

- Safety, protection, and compliance verification
- High-voltage testing and dielectric strength
- Ground continuity and bonding verification
- Insulation resistance testing
- Protection relay testing and coordination
- Documentation and standards compliance verification

### ENVIRONMENTAL TESTING

- Temperature and humidity cycling
- Vibration and seismic testing
- Salt spray and corrosion testing
- Ingress protection (IP) verification
- Altitude and pressure testing
- UV and weathering exposure

### FIELD COMMISSIONING SERVICES

- Field deployment and commissioning readiness
- On-site installation supervision
- System startup and commissioning
- Performance optimization and tuning
- Operator training and technical documentation
- As-built documentation and drawings

### STANDARDS COMPLIANCE

- IEEE, ANSI, IEC standards compliance
- UL, CE, CSA certifications
- Grid code compliance
- Environmental regulations (EPA, local)
- Electrical code (NEC, CEC) compliance
- Occupational safety (OSHA) requirements

# OPERATIONAL EXCELLENCE THROUGHOUT PRODUCTION

## QUALITY SYSTEMS & CONTINUOUS IMPROVEMENT

### QUALITY MANAGEMENT SYSTEMS

- ISO 9001 certified operations
- Quality system and safety program implementation
- Statistical process control (SPC)
- First-article inspection data
- Quality assurance validation
- Continuous quality improvement

### CONTINUOUS IMPROVEMENT

- Real-time performance and efficiency monitoring
- Data-driven process analytics and optimization
- Predictive maintenance and equipment reliability implementation
- Process refinement and cost reduction initiatives
- Continuous improvement and lessons learned feedback loops
- Lean manufacturing and continuous improvement tools
- Manufacturing system optimization initiatives
- Best practice and safety enhancement implementation

### FULL-RATE PRODUCTION

- Target production volume execution
- Customer delivery schedules and project milestones
- Supply chain coordination and vendor management
- Preventive maintenance and calibration programs
- ISO 9001 and industry standards compliance maintenance

### PRODUCTION RAMP & SCALING

- Incremental production scaling
- Workforce training and certification expansion
- Process cycle time optimization
- Quality yield stabilization and defect reduction
- Automated testing and inspection implementation
- Target production rate achievement

### TRACEABILITY & DOCUMENTATION

- Material and component lot traceability
- Serial number tracking and genealogy
- Welding procedure specifications (WPS)
- Material certifications and mill test reports
- Calibration records and certificates
- Quality assurance validation

### PRODUCTION CONTROL

- Standard operating procedures and work instructions
- Operator training and certification
- Quality control plan execution
- In-process inspection and testing
- Non-destructive testing monitoring
- Final inspection and acceptance