ESI

Proven Performance By Design

A TransTech Company

About ESI

ESI is a single-source industry solution provider offering outstanding technical expertise in engineering and operations to the biogas utilization and RNG industries, backed by decades of experience.

We help customers develop responsible, sustainable projects that drive measurable, positive impact while protecting workers, communities, and the planet. Our mission is to advance low-carbon solutions that promote long-term value and a better future.

Our technical skills in development assistance, engineering, procurement, construction, and operations and maintenance (O&M) have been integral in the development and operation of over 100 biogas utilization projects, delivered to a diverse client base nationwide—and around the world.

Company Overview

ESI was founded as an engineering firm but **expanded to include the development, construction, operations and maintenance of facilities** in today's rapidly changing biogas industry.

Our engineers, construction managers, and facility operators have been leaders in renewable energy for more than **25 years with experience** that includes:

- Biogas gas power generation
- RNG upgrading, gas treatment
- Advanced SCADA and control systems
- Landfill gas beneficial use feasibility
- Environmental compliance management
- Condensate/leachate management
- Biogas extraction and collection
- Specialized collection and monitoring equipment
- Operational product development

ESI is a part of the TransTech Energy family of companies. Our sister companies provide a nationwide footprint for engineering, fabrication, construction, and operations.

Since 2007, ESI's engineering experience includes:

- 75+ Biogas utilization and cleanup projects
- 50+ Best-In-Class SCADA/Control Systems
- 50+ Construction/Operations projects utilizing biogas
- 25 RNG Facilities

Services Overview

Engineering
- Renewable Natural Gas
- Gas-to-Energy
- Direct Use Biogas Utilization
- Heat Recovery (CHP)
- Landfill Gas Collection and Control System (GCCS)

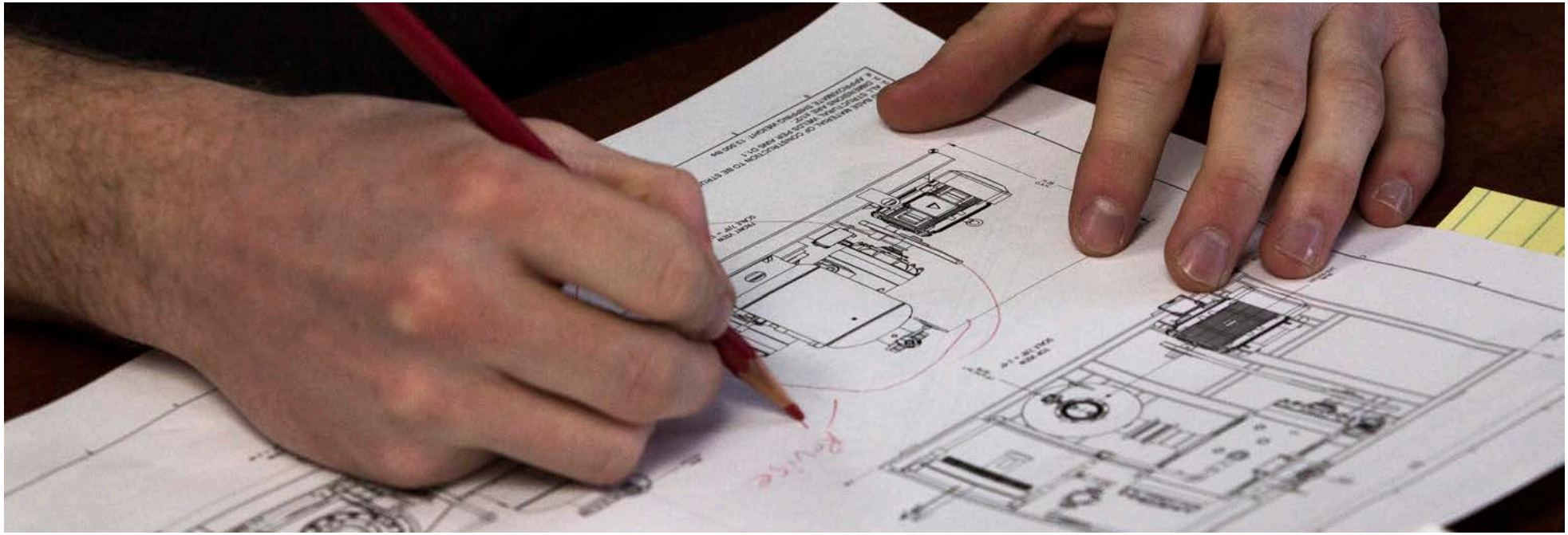
Technical Consulting
- Project Feasibility and Technology Review
- Project Development Assistance and Financial Due Diligence
- Environmental Permitting and Compliance
- Greenhouse Gas Reporting and Verification

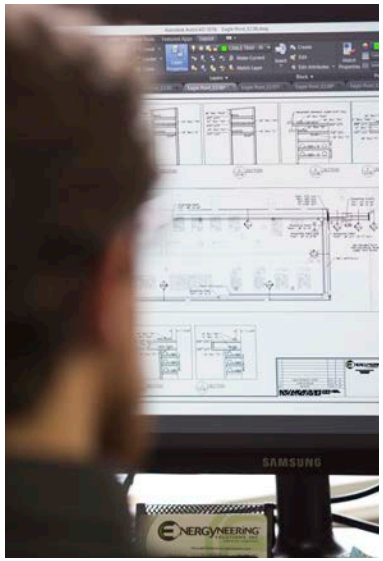
EPC
- Construction Management Oversight
- Turn-Key Biogas Utilization Facilities

Facility Operations
- 24-7 Facility Operations
- 3rd Party Major Maintenance Services
- Cylinder Head Rebuild Program
- Custom Products for Facility Operations

SCADA/Controls
- Supervisory Control and Data Acquisition (SCADA) System
- PLC Panel Design, Programming, and Controls
- Flare Controls Integration w/ Utilization Facilities

Lifecycle Data Management
- Integrated Analytics
- Continuous Improvement
- Run-Time Optimization
- Predictive Maintenance





Engineering Services

ESI has served as the primary/lead engineer for hundreds of diverse biogas projects, providing services that include: process, mechanical, electrical, and controls engineering. Our team of professional engineers is licensed in over 30 states and has proven their ability on projects nationwide and internationally.

Our engineering team has been integral in the engineering design of diverse biogas projects including:

- Renewable Natural Gas facilities
- Biogas-to-energy facilities
- LFG/Digester gas (DG) utilization feasibility studies
- Landfill gas collection and control projects
- Landfill gas treatment systems
- Anaerobic digester projects
- And many more biogas & renewable fuels projects

Landfill Gas Collection & Control (GCCS)

Backed by over six decades of experience that spans all aspects of landfill gas (LFG) collection and control, ESI can serve as a single source provider for every phase of your LFG project—from project development, engineering, construction, controls integration and SCADA, through operations & maintenance—or deliver standalone services to suit your needs.

ESI has played a pivotal technical role in LFG engineering, operations, controls, and technical consulting across a variety of successful projects, including over 30 GCCS and flare systems

EPC & Construction Management (CM)

ESI is an industry leader in Construction Management and Oversight for biogas utilization projects, with the experience and knowledge to deliver all your Biogas projects to completion—on time and within budget.

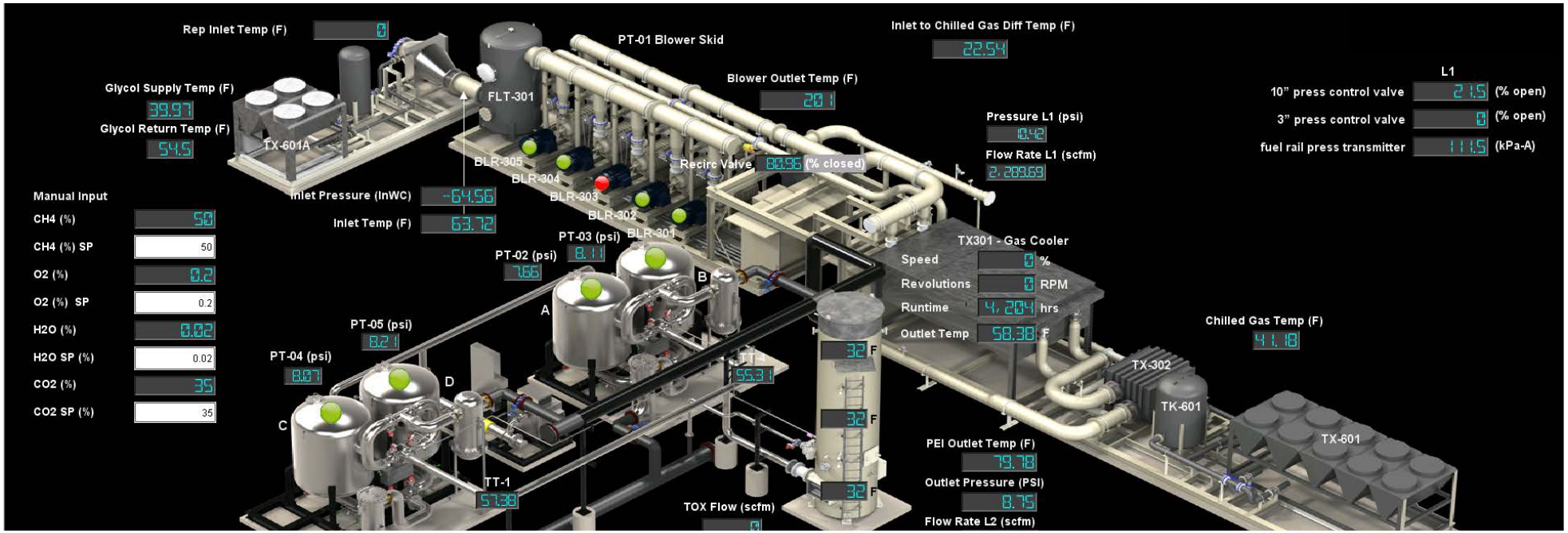
Our proven approach lets us supply complete construction management teams, best-in-class technology and equipment, and trusted project-specific partners to meet your most challenging biogas project demands.

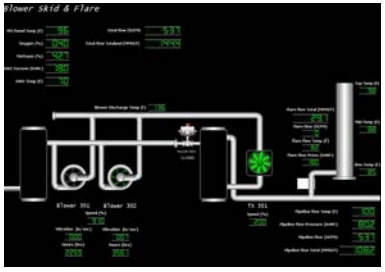
With a nationwide portfolio of over 50 completed projects (new and retrofit), our seasoned project and construction management teams, field service personnel and strategic partners have delivered projects as specified, on schedule, and within budget, again and again.

Facility Operations & Maintenance

ESI delivers expert operations and maintenance (O&M) services for a nationwide portfolio of biogas utilization, RNG, and power generation facilities.

As a Total Solution Provider, we bring unique, cross-functional value to every aspect of facility O&M. In addition to our standard suite of O&M solutions, we offer integrated analytics solutions utilizing data from O&M, controls & monitoring, and SCADA—for continuous improvement, run-time optimization, and predictive maintenance.





SCADA Systems

As a biogas industry pioneer, ESI was an early proponent of advanced Supervisory Control and Data Acquisition (SCADA) and controls systems for renewable energy facilities. Today, we're the industry leader in cutting-edge SCADA system development, with over 30 SCADA/Control systems installed, all uniquely tailored to the biogas industry.

Additionally, ESI's state of the art panel shop builds custom control panels to UL 508A, 698A, and hazardous locations standards. Our Balance of Plant (BOP) panels are designed and built for facility master control which coordinates the overall skid function and interconnectivity for the panels.

Renewable Natural Gas

ESI is an industry leader in Renewable Natural Gas (RNG) facility engineering, design, construction, and technical consulting. We help RNG investors develop a wide range of biogas resources including landfill gas (LFG), agricultural waste, animal waste, recycled organics, and other anaerobic digester sources

While ESI is technology agnostic, as a true third-party engineer we maintain relationships with virtually every one of the leading RNG technology suppliers in the industry. We're committed to providing clients with best-in-class solutions optimal for the unique needs of each project.

Anaerobic Digester

ESI is an industry leader in project evaluation/feasibility, permitting, facility engineering design, optimization, controls integration, technical consulting, and operations & maintenance (O&M) for anaerobic digester (AD) gas utilization projects.

ESI has delivered facility-engineering, controls integration, operations, and maintenance (O&M) services for an array of biogas utilization facilities at anaerobic digester sites nationwide.

We understand the unique challenges of AD biogas utilization projects —particularly with regards to integration of the biogas utilization facility with the digester to achieve maximum capacity operations.

Biogas-to-Energy

ESI is widely recognized as an industry leader in delivering cutting edge technical solutions for the Biogas-to-Energy industry—serving in both a consultative capacity and as a full-service EPC or O&M contractor.

As a true single source provider for Biogas-to-Energy projects, ESI can manage all aspects of your biogas-to-energy project from preliminary development, engineering, equipment procurement, permitting, construction, controls integration, SCADA, and startup through to the ongoing operation of your facility.

CASE STUDY – FOOTHILLS LANDFILL & UPPER PIEDMONT LANDFILL RENEWABLE NATURAL GAS FACILITIES

3,000 SCFM LFG-to-RNG (Foothills, Upper Piedmont)

As a single source provider, ESI managed all aspects of these renewable natural gas projects from preliminary development through engineering, equipment procurement, permitting, construction, controls integration, SCADA, and startup, in addition to the ongoing day-to-day operation of these facilities ESI's outstanding ability to deliver seamless integration of multiple technologies (mechanical, electrical, and controls) supplied by multiple equipment vendors enables us to produce a unified operating facility—designed to maximize facility safety, performance, and uptime.

UNIQUE CHALLENGE

ESI maintained clear communication on project timelines while managing procurement challenges due to industry-wide supply chain issues.

- Worked closely with developer partner
- Designed for operability - leveraged 25 years of experience in turnkey EPC projects & in-house fabrication for balance of plant equipment fabrication to minimize supply chain challenges and maintain project critical path

SCOPE OF WORK:

- Due Diligence Assistance
- Pipeline Technical Coordination
- Electric Utility Technical Coordination
- Environmental Permit Review & Analysis
- Basis of Design
- Electric Single-Line with Load Schedules
- Preliminary Permit Documentation
- Landfill Gas Reserve Analysis
- Detailed Engineering Design
- Procurement of Major Equipment
- Construction Management
- Operations & Maintenance Contract

CASE STUDY – CENTRAL MISSOURI LANDFILL RENEWABLE NATURAL GAS FACILITY

3,000 SCFM LFG-to-RNG

ESI provided the full suite of engineering services for a 3,000 SCFM landfill gas to renewable natural gas (RNG) facility. ESI's scope for the project included civil, structural, geotechnical, process, mechanical, electrical, network, and controls engineering services. In addition our sister companies Maddox Industrial Group (MIG) and Bendel Tank & Heat Exchanger handled installation, construction, fabrication for all equipment and structural needs.

UNIQUE CHALLENGE

ESI maintained managed procurement, installation, construction, and commissioning timelines.

- Worked closely with developer partner to meet project schedule and budget objectives.
- Designed for operability - leveraged 25 years' experience in turnkey EPC projects & in-house fabrication for balance of plant equipment fabrication to minimize supply chain challenges and maintain project critical path.
- Partnered with sister companies Maddox Industrial Group (MIG) for all process piping and installation needs.
- Partnered with sister company Bendel Tank & Heat Exchanger to facilitate Heat Exchanger construction, fabrication, and installation on landfill site.

SCOPE OF WORK:

- Due Diligence Assistance
- Pipeline Technical Coordination
- Electric Utility Technical Coordination
- Environmental Permit Review & Analysis
- Detailed Engineering Design
- Electric Single-Line w/ Load Schedules
- Preliminary Permit Documentation
- Landfill Gas Reserve Analysis
- Procurement of Major Equipment
- Construction Management
- Operations and Maintenance Contract

CASE STUDY – LOESS HILLS LANDFILL RENEWABLE NATURAL GAS FACILITY

4,000 SCFM LFG-to-RNG

As a single source provider, ESI managed all aspects of this renewable natural gas project from preliminary development through engineering, equipment procurement, permitting, construction, controls integration, SCADA, and startup, in addition to the ongoing day-to-day operation of these facilities ESI's outstanding ability to deliver seamless integration of multiple technologies (mechanical, electrical, and controls) supplied by multiple equipment vendors enables us to produce a unified operating facility—designed to maximize facility safety, performance, and uptime.

UNIQUE CHALLENGE

ESI maintained clear communication on project timelines while managing procurement challenges due to industry-wide supply chain issues.

- Worked closely with developer partner
- Designed for operability - leveraged 25 years of experience in turnkey EPC projects & in-house fabrication for balance of plant equipment fabrication to minimize supply chain challenges and maintain project critical path

SCOPE OF WORK:

- Due Diligence Assistance
- Pipeline Technical Coordination
- Electric Utility Technical Coordination
- Environmental Permit Review & Analysis
- Basis of Design
- Electric Single-Line with Load Schedules
- Preliminary Permit Documentation
- Landfill Gas Reserve Analysis
- Detailed Engineering Design
- Procurement of Major Equipment
- Construction Management
- Operations & Maintenance Contract

CASE STUDY - GLACIER RIDGE LANDFILL RENEWABLE NATURAL GAS FACILITY DESIGN

ESI provided the full suite of engineering services for a 3,100 scfm landfill gas-to-renewable natural gas (RNG) facility. ESI's scope for the project included civil, structural, geotechnical, process, mechanical, electrical, network, and controls engineering services. The facility utilizes two, sequential, Air Liquide Membrane Systems for CO2, O2, and N2 removal.

UNIQUE CHALLENGE

The Glacier Ridge RNG project provided exciting challenges from the onset due to its location. The facility sits in a what was formerly a depressed drainage that was wrought with saturated and disturbed soils, old foundations, abandoned electrical infrastructure, and ground water monitoring wells. To further complicate matters, the site location shares a common access road with the landfill's leachate pump out system, which routinely sees traffic from several tanker trucks a day.

SCOPE OF WORK:

- Full Suite of Engineering Services
- Factory Acceptance Testing
- Balance of Plant PLC Panel
- SCADA System & Network Design
- State & Local Permitting
- Startup & Commissioning
- Construction Quality Assurance
- Construction Management Support
- Process Hazards Analysis
- Operator Training & Ongoing Support

CASE STUDY - FOUR PEAKS ENERGY CENTER FOR POWER GENERATION

ESI provided a series of upgrades to the Four Peaks Energy Center that have allowed the site to have the ultimate flexibility in how it produces power. The facility now has the ability to send power directly to the data center and capture revenue through that avenue. However, if it is more profitable to sell the power back to the grid we have created the capability for the site to accomplish that as well. By creating two ways to capitalize on power generation, ESI has given the Four Peaks facility ultimate flexibility in deciding how they want to operate their site.

UNIQUE CHALLENGE

The Four Peaks facility presented engineering design challenges as our team needed to work to integrate new equipment into the existing facility. Our team of engineers worked collaboratively to find the best design that worked with the existing system to achieve the flexibility the Nodal team was looking for. We additionally needed to integrate the new load shed system into the existing facility controls, which has legacy controls and was not set up for external load in conjunction with producing its own power. This was equally a design exercise and a mechanical hardware installation challenge for the ESI team.

SCOPE OF WORK:

- Installing the data center
- Installing the new transformer and breaker
- Integrating the new equipment into the existing facility infrastructure
- Remote monitoring and metering
- In house load shed system

CASE STUDY - DAVIS LANDFILL GAS TO ENERGY FACILITY

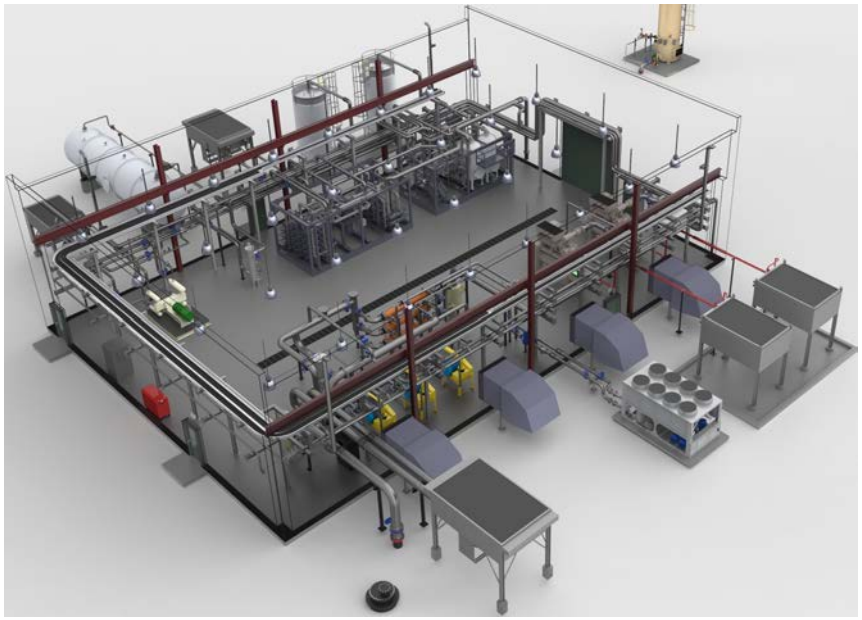
ESI provided engineering, procurement and construction management services to the Davis Landfill for the installation of landfill gas handling equipment and a CAT 3520 generator on a 1.6 MW site. ESI designed and fabricated a 750 scfm blower skid at our primary campus in Sisters, Oregon for this project. The upgrades to the Davis Landfill will utilize excess Landfill gas produced by the Davis County Landfill to power an onsite data center.

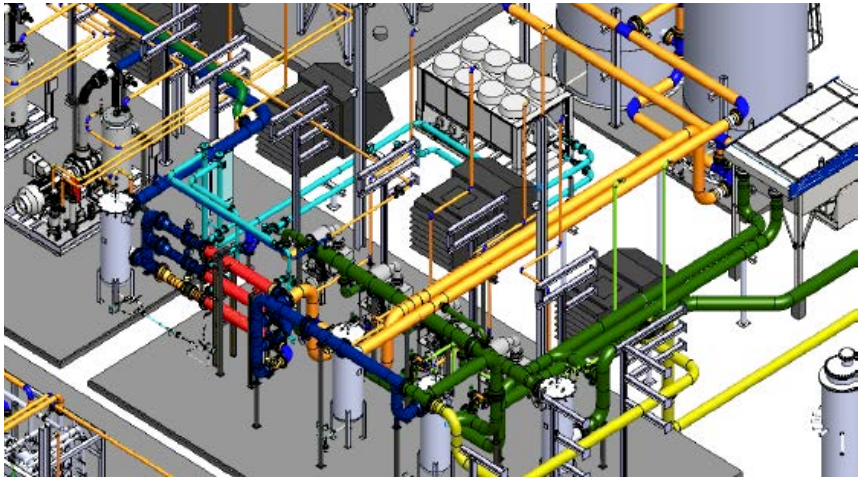
UNIQUE CHALLENGE

The Davis Landfill project required a never before implemented solution to utilizing landfill gas. Their system is operating in island mode, which means that the output of the engine is not connected to the local grid. This presents multiple challenges, most pressingly how to balance the electrical load produced by the generator with the onsite instantaneous electrical demand. This challenge is being eliminated by utilizing a proprietary load control system, which manages the energy output load out to the data center. Utilizing our extensive experience in engineering design and operations, our team is fine-tuning the system in order to control the electrical site supply and demand on an instantaneous timeframe.

SCOPE OF WORK:

- Engineering, Procurement, Construction
- Process Design
- Mechanical Design
- Structural Design
- Electrical Design
- Controls Design
- SCADA Implementation





CASE STUDY – SOUTHEAST OKLAHOMA CITY LANDFILL RENEWABLE NATURAL GAS FACILITY DESIGN

3,000 SCFM Landfill Gas Input
1800 MMBTU/day RNG Output

ESI provided full process, mechanical, and electrical engineering services for a 3,000 scfm landfill gas-to-renewable natural gas (RNG) facility in Oklahoma City, OK. The facility utilizes a membrane-based CO2 removal system integrated with a PSA based nitrogen rejection unit (NRU). ESI provided the complete facility design in 3D while also delivering a comprehensive 350-page set of construction drawings.

UNIQUE CHALLENGE

The project required seamless integration of multiple technologies supplied by multiple vendors to produce a cohesive operating facility. To streamline the integration of the facility, ESI's construction deliverables went above and beyond a standard MEP drawing package to include spool-by-spool pipe fabrication drawings, point-to-point cable termination drawings, and detailed pipe support drawings. Aria's investment in this level of design saw its return in an expedited construction schedule, prefabrication savings, and ultimately faster delivery of RNG to the market. ESI is proud to work with clients like Aria, who appreciate the value of a comprehensive and detailed design.

SCOPE OF WORK:

- Process Engineering
- Mechanical Engineering
- Electrical Engineering
- Controls Engineering Assistance
- Advanced 3D Facility Design

Our Family of Companies

Beaumont, TX
170,000 square foot fabrication facility
Metalforms

McGregor, TX
170,000 square foot fabrication facility
TransTech Fabrication

Charlotte, NC
65,000 square foot fabrication facility
Bendel Tank & Heat Exchanger

Indianapolis, IN
46,000 square foot fabrication facility
Maddox Industrial Group

Rocky Mount, NC
25,000 square foot fabrication facility
TransTech Energy

Sisters, OR
20,000 square foot fabrication facility
ESI

Mike Skov
Business & Contract Development Director
Phone: 970-819-0919
mskov@esisolutions.com

Benny Benson
President
Phone: 541-719-1123
Mobile: 541-390-7232
bbenson@esisolutions.com