



Industrial Assessment Center

U.S. DEPARTMENT OF ENERGY

Newsletter

Executive Information

The work described in this newsletter is for the period of 01/03/2019 to 05/31/2019 based on the activities of the West Virginia University Industrial Assessment Center (WVU-IAC). The center supports and carryout activities that are funded by US DOE Industrial Assessment Center program, EPA’s Pollution Prevention (P2) program and USDA’s rural energy audit program. The center promotes “efficiency improvement” through structured on-sight assessments that target energy efficiency, environmental and process waste, lean and smart manufacturing. Technical assistance and training is also provided to the interested entities. Our clients range from local small businesses in the rural settings to small and medium sized enterprises (SME) nationwide.

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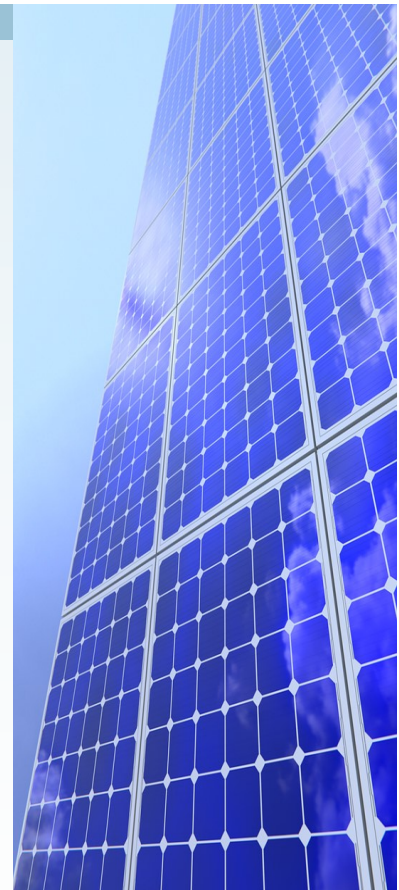
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Overview of Programs

IAC Program:

The [Industrial Assessment Center](#) at [West Virginia University \(WVU-IAC\)](#), is one of many centers around the country, funded by the [U.S. Department of Energy](#) to provide no-cost energy, waste, water, cyber security, and smart manufacturing assessments to small and mid- sized manufacturers. A team of students and professors do the engineering measurements in assessing how each facility utilizes energy and resources. Then, the [WVU-IAC](#) identifies the opportunities to save energy, reduce waste, and improve productivity.

Small and medium sized manufacturers may be eligible to receive a no-cost assessment provided by the [WVU-IAC](#). The [WVU-IAC](#) team performs detailed process analysis to generate specific recommendations with cost and resource savings, implementation cost, and payback on investment. Within 60 days the plant receives a confidential report detailing the analysis, findings and recommendations.

Eligibility for IAC Assessment:

- Within Standard Industrial Codes (SIC) 20-39 and NAICS 33-39
- Water and waste water treatment facility or institutional facility
- Within 3 to 4 hour drive from Morgantown
- Gross annual sales below \$100 million
- Fewer than 500 employees at the plant site
- Annual utility bills more than \$100,000 and less than \$2.5 million
- No in-house professional staff to perform the assessment

More info about [IAC Program](#)

P2 Program:

Reduction of waste at the source level by providing Technical Assistance and Training is one of the most effective methods to assist facilities with identification, development and adoption of [Pollution Prevention](#) (P2) approaches.

The [Industrial Management and Systems Engineering Program](#) at [West Virginia University](#) is offering Technical Assistance and Training Programs for the food and beverage manufacturing and processing facilities in the state of West Virginia to assist facilities with identification, development and adoption of Pollution Prevention (P2) methods.

Technical Assistance program involves on-site P2 assessments. The project team makes a planned visit to the facility to assess and gather data on energy, water, material and human use. The data and inputs from the facility managers is used to develop P2 recommendations. A detailed report based on the findings of the on-site visit are submitted to the facility within a few days from the on-site P2 assessment. The report contain several recommendations concerning

- Energy efficiency
- Water and material waste reduction
- Lean implementation
- Air Pollutant and Greenhouse Gas Evaluations

Training Workshops are organized to train businesses/facilities about the source reduction techniques to help them adopt and implement P2 approaches, and to increase the development, adoption, and market penetration of greener products and sustainable manufacturing practices.

- [Participate in the Technical Assistance program and/or Training Workshops](#)
- To learn more about the [P2 program](#)

USDA Program:

This program is specifically designed to provide energy efficiency assistance to agricultural producers and for-profit small business located in the rural parts of West Virginia. The project team conducts on-site energy audits specifically developed for agricultural producers and rural small businesses and a detailed [energy assessment report](#) is submitted to the client.

Eligibility: Rural agricultural producers and for-profit small business are eligible to receive energy audit through this program. A for-profit small business is defined as any business that employs less than 500 people in a designated rural area and makes under a certain revenue based upon the type of business.

Benefits: Our energy audit recommendations can help save from 5 to 10 % of energy costs in areas of lighting, HVAC and building envelope thermographic analysis per year. The analysis of high energy consuming processes could result in even higher cost saving recommendations.

Using the [energy assessment report](#), the clients can apply for financial assistance through USDA-REAP grants and guaranteed loans programs. The grants range from \$1,500 to \$250,000, and cannot exceed 25% of total project costs. The maximum guaranteed loan is \$25 million, which may not exceed 75% of total project costs.

Audit costs: As a participant in this program the client is only expected to pay \$125 for a full energy audit of their facility and will receive a comprehensive [energy assessment report](#). This type of audit normally averages around \$3,000 but funding from the USDA covers the majority of the cost.

[More info about program](#)

A Glimpse of this Cycle

- Fifteen on-site assessments have been completed during this cycle under IAC, P2, and USDA program's.
- Dr. Bhaskaran Gopalakrishnan, Director [WVU-IAC](#) attended [Inaugural West Virginia Manufacturing Summit](#) held in Morgantown, WV.
- Roseline Mostafa, an MSIE student have joined the [WVU-IAC](#) in Summer 2019.
- Goutham Kumar Reddy Challa successfully finished his problem report on “Evaluation of a Marketing Strategy Based on the Concept of Virtual Energy Audit”.
- Omar Al-Shebeeb successfully finished his Dissertation on “Analysis of the Integration of DFM Techniques and Effective Machining Parameters Selection in Metal Parts Manufacturing”.

Recommendations from On-site Assessments

The [WVU-IAC](#) has conducted several assessments at various manufacturing facilities in the states of West Virginia and Ohio. The team has given several energy efficiency, lean, waste, water and smart manufacturer recommendations to improve the functionality of the manufacturing facilities.

Sample Recommendations

IAC Assessment Recommendation Newell, WV

Install Smart Sensors to Automatically Adjust the Air to Fuel Ratio of the Burners in the Kilns

Installing smart combustion controls to adjust the air/fuel ratio of the burners to improve the overall combustion system efficiency of the kilns.

Energy Savings: 86,400 MMBtu/yr Natural Gas consumption is reduced as a result 97,632 lbs of CO₂ emission is reduced.

Implementation Cost: \$432,000

Total Savings per year: Energy Cost Savings: \$274,752/ yr

Payback Period: 19 months.

IAC Assessment Recommendation Newell, WV

Replace Existing Burners on the Kilns with Energy Efficient Self-Recuperative Burners

Replace the existing burners with the self-recuperative burners to preheat the intake air on the kilns. This measure will reduce natural gas consumption since warmer combustion air leads to increase in combustion efficiency.

Energy Savings: 44,573 MMBtu/yr Natural Gas consumption is reduced as a result 5,036,749 lbs of CO₂ emission is reduced.

Implementation Cost: \$375,000

Total Savings per year: Energy Cost Savings: \$141,742/yr

Payback Period: 32 months.

IAC Assessment Recommendation Jackson Center, OH

Install a Proximity Sensor with a Timer on the Powder Coat Exhaust Fan

Install a proximity sensor along with an electromechanical timer on the 15-hp “Powder Coat Exhaust Fan” motor. Optimal operation of the exhaust fan motor will result in reduced electrical energy consumption . MotorMaster+4.0 BestPractice software was used during the development of this assessment recommendation.

Energy Savings: 10,140 kWh/yr Electricity consumption is reduced as a result 22,207 lbs of CO₂ emission is reduced.

Implementation Cost: \$1,275

Total Savings per year: Energy Cost Savings: \$715/yr

Payback Period: 22 months.

P2 Assessment Recommendation Parkersburg, WV

Sell Potato Peel Waste (PPW), Rejected Potatoes and Potato Chips as Bio Digester Feed

Sell Potato Peel Waste (PPW) Rejected Potato and Potato Chips as Bio digester Feed or for industrial starch use.

Energy Savings: 136,556 kWh/yr Electricity Consumption is reduced as a result 299,057 lbs of CO₂ emission is reduced.

Implementation Cost: \$0

Total Savings per year: Net Cost Savings: \$5,600/yr

Payback Period: 0 months.

P2 Assessment Recommendation Parkersburg, WV

Employ Label Dispenser Machine for Labelling to Improve Productivity

Employ a Label Dispenser Machine after the packaging to reduce labelling time and increase productivity

Reduction of labelling time per year: 83 hrs/yr

Implementation Cost: \$1,500

Total Savings per year: Equivalent Cost Savings: \$2,075/yr

Payback Period: 3 months.

Cyber Security

Cyber terrorism is a real and growing threat. Standards and guides have been developed, vetted, and widely accepted to assist with protection from cyber attacks. WVU-IAC has conducted cyber security assessment for one of the participating SMEs using the Cyber Security Evaluation Tool (CSET). The CSET includes a selectable array of available standards for a tailored assessment of cyber vulnerabilities. Once the standards were selected and the resulting question sets answered, the CSET creates a compliance summary, compiles variance statistics, ranks top areas of concern, and generates security recommendations.

WVU-IAC is planning to use new cybersecurity assessment tool Industrial Control Systems Cybersecurity Assessment Tool provided by U.S Department of Energy. The tool promotes awareness of cybersecurity risk areas associated with Industrial Control Systems (ICS) in Industrial facilities. Tool includes 20 simple questions to characterize ICS and plant/facility operations and produces a preliminary assessment of risk (i.e high, medium, or low). It also generates a customized list of action items to help improve preparedness for a cybersecurity event

Recommendations given using CSET Tool

Area of concern: Organizational:

- Identify individuals with system security roles and responsibilities.
- Make the system design and implementation process such that it defines the security roles and responsibilities for the users of the system.
- Define a set of rules that describes the system user's responsibilities and expected behavior established and made available .

Area of concern: Monitoring & Malware:

- Deploy monitoring devices strategically to collect essential information within the system to track specific types of transactions of interest .
- Heighten the level of monitoring activity whenever an indication of increased risk exists.
- Define a organizational policy for frequency of vulnerability scans.
- Share the information obtained from vulnerability scanning process with designated personnel throughout the organization

Area of concern: Communication Protection:

- Cryptographic keys need to be established and managed using automated mechanisms.
- Maintain communication cryptographic mechanisms in comply with applicable regulatory requirements, policies, standards, and guidance.

Area of concern: Audit & Accountability:

- Enforce frequency of audit for each identified auditable event.
- System audit records should be reviewed and analyzed on a defined frequency and findings need to be reported to designated officials
- Events to be audited need to adjust within the system based on current threat information and ongoing assessments of risk.

Center Activities

- [WVU-IAC](#) team conducted a [industrial assessment](#) at the manufacturing facility of signs and decals for vending machines, Kearneysville, WV under IAC program.
- [WVU-IAC](#) team conducted a [building energy efficiency study](#) at multipurpose arena serving Huntington, WV under IAC program.
- [WVU-IAC](#) team conducted a [industrial assessment](#) at the manufacturing facility of Galvanized steel sheets, Pittsburgh PA under IAC program.
- [WVU-IAC](#) provided [technical assistance](#) to the engineering team at the manufacturing facility of Ceramic Dinnerware, Newell WV.
- [WVU-IAC](#) organized [Productivity Improvement & Energy Efficiency](#) conference.
- [WVU-IAC](#) team conducted [Ultrasonic Equipment training](#) for employees of the manufacturing facility of food grade plastic containers and covers, Mineral Wells WV.
- [WVU-IAC](#) team conducted a [industrial assessment](#) at the manufacturing facility of hot dog chili, Webster Springs WV under P2 and USDA program.
- [WVU-IAC](#) team conducted a [industrial assessment](#) at the Natural Gas compression station, Salem WV.
- [WVU-IAC](#) team conducted a [industrial assessment](#) at the manufacturing facility of Air-dried recycled pulp, Fairmont WV under IAC program.
- [WVU-IAC](#) team conducted a [industrial assessment](#) at the manufacturing facility of Thermoset Plastics, Napoleon OH under IAC program.

Resources available for efficiency enhancement

- 1) [AIRMASTER+](#)
- 2) [Pumping System Assessment Tool](#)
- 3) [Fan System Assessment Tool](#)
- 4) [Mechanical Insulation Assessment and Design Calculators](#)
- 5) [Steam System Tool Suite \(SSTS\)](#)
- 6) [Industries Facilities Scorecard](#)
- 7) [Plant Energy Profiler/Integrated Tool Suite \(ePEP\)](#)
- 8) [Combined Heat and Power\(CHP\) Application Tool](#)
- 9) [NOx and Energy Assessment Tool \(NxEAT\)](#)

The Team of IAC

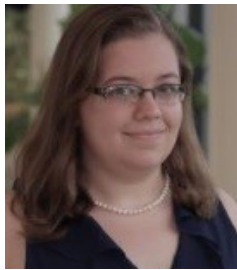


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