

# WVU POLLUTION PREVENTION NEWSLETTER

DECEMBER 2024

## INDUSTRY FOCUS: BOILER AND STEAM SYSTEMS

Welcome to the latest edition of the WVU Pollution Prevention Newsletter! In this issue, we are excited to introduce the dedicated members of the WVU Pollution Prevention Team, committed to environmental stewardship. Explore valuable insights as we share best practices for enhancing energy efficiency and reliability and reducing operating costs of boiler and steam systems in industrial facilities. Lastly, discover the range of services we offer to support Small and Medium-sized Enterprises and businesses throughout West Virginia. Stay informed, inspired, and engaged with our commitment to environmental excellence and community impact.

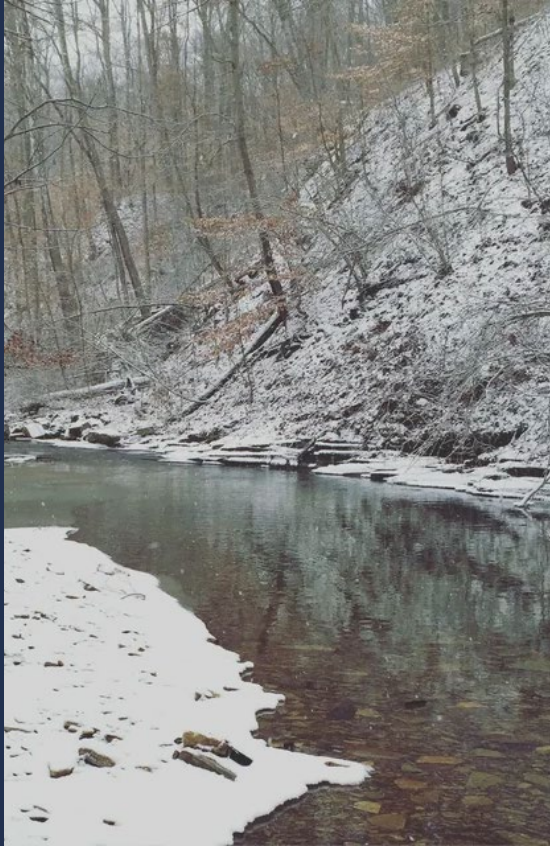
### FEATURED IN THIS EDITION

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# WHAT IS POLLUTION PREVENTION



**Pollution Prevention (P2)** is one of the key approaches towards an initiative to improve the energy efficiency and productivity of key industries while prioritizing environmental sustainability. The initiative focuses on reducing or preventing pollution at its source.

The primary objective of our Pollution Prevention program is to provide technical assistance to Small and Medium Enterprises in **key industries** and within **disadvantaged communities** in West Virginia by assisting with identification, development, and implementation of P2 methods. The recommendations provided to the industries are designed to help the business lower operational costs by reducing expenditures, water and energy usage, waste, and disposal costs, while at the same time maintaining and often improving productivity.

## **Key Industries:**

1. Food and Beverage Manufacturing and Processing
2. Chemical Manufacturing, Processing, and Formulation
3. Automotive Manufacturing and Maintenance
4. Aerospace Product and Parts Manufacturing and Maintenance
5. Metal Manufacturing and Fabrication

## OUR SERVICES

1. **Pollution Prevention Assessments:** The project team will make a planned visit to your facility to assess and gather data on energy, water, material, and personnel use. Assessment data along with input from the facility managers will be used to develop P2 recommendations. A detailed report based on the findings will be submitted to the facility shortly after the on-site assessment.
2. **Energy Audits/Assessments:** Applying for a USDA-REAP grant and need an assessment? Want to save money? The project team will visit your facility and identify opportunities to improve energy efficiency. A detailed report will be provided to the business, including estimates of implementation costs, energy use savings, energy cost savings, and simple payback period for each identified opportunity.
3. **Training Workshops:** Training workshops will be conducted to help businesses learn P2 Best Practices, tools, techniques, and resources available, and how to modify their process or site to improve energy efficiency, productivity, and environmental sustainability.
4. **Technical Assistance:** The project team can provide on-site or off-site technical assistance on a variety of industrial concerns related to topics including pollution prevention, energy efficiency, sustainability, environmental impact, and process improvement. Contact us for assistance!
5. **USDA-REAP Application Assistance:** Applying for grant funding can be a challenge, especially for the small businesses that do not have an expert at grant-writing on the payroll. Our project team can help you navigate the application process and assist with completing the application for USDA-REAP funding.

## P2 INDUSTRY FOCUS

### Tips for Energy Efficiency in Boiler & Steam Systems

- **Optimize Air-Fuel Ratios:** When the air-fuel ratio of a boiler is optimized, it can run much more efficiently and last longer. When the air-fuel ratio is too lean – a condition where there is an excess of oxygen - the boiler cannot extract the heat from the burning fuel as efficiently. When the air-fuel ratio is too rich, the fuel is not completely burnt. This will result in reduced efficiency, increased soot build-up, and increased emissions. Either way, it's more costly than a well-tuned boiler. Facilities should consider training existing maintenance personnel to check and optimize the air-fuel ratio of the boilers or hire a professional to check and adjust air-fuel ratio once or twice a year.
- **Preheat Boiler Feed Water Using Stack Gases:** Even when a boiler is properly maintained and running efficiently, the exhaust gases still contain a significant amount of heat. By installing heat exchangers, the waste heat from the exhaust stack can be captured and used to pre-heat the feed water going into the boiler. By pre-heating the water, less heat is required to maintain the temperature of the water in the boiler at the proper temperature, saving fuel and improving efficiency.
- **Insulate Hot Surfaces on Boiler Pipes:** Hot surfaces mean that heat is being lost into the environment instead of reaching its intended destination, decreasing the efficiency of the system. Insulating hot surfaces with fiberglass, mineral wool, or calcium silicate insulation can reduce heat loss, making the system more efficient and reducing fuel costs. With the relatively low cost of insulation and a significant reduction of heat loss, insulating steam and boiler system components resulting in a short payback period, savings can be realized quickly.
- **Inspect, Repair, and Maintain Steam Traps:** Maintaining steam traps is crucial for ensuring efficiency and minimizing costs. When steam traps function correctly, they effectively remove condensate and non-condensable gases from the steam system, which prevents waste of steam and maintains optimal steam quality. This translates to reduced energy consumption since the system doesn't have to work harder to compensate for steam loss. Regular maintenance prevents the buildup of condensate, which can cause corrosion and damage to the system, leading to costly repairs or replacements. By keeping steam traps in good working order, companies can improve the reliability and longevity of their equipment, lower operational costs, and achieve significant savings on energy and maintenance expenses.
- **Repair Steam Leaks:** Steam leaks can result in steam waste at significant cost. A single steam leak can cost \$10,000+ in lost steam per year. Steam leaks can also pose a safety risk to workers in the facility. While it may require an interruption in production to repair, the relatively low material and labor costs in combination with the drastic savings make these repairs an easy decision.
- **Replace Old Burners with Efficient Models:** Burner technology has improved over time. Older boilers with original burners can be improved by replacing the burners with modern, high-efficiency burners. These burners offer several economic and environmental benefits, including:
  - Reduced fuel consumption
  - Reduced greenhouse gas emissions
  - Improved reliability
  - Improved control
  - Reduced operating costs



## HIGHLIGHTING OUR IMPACT

The WVU Pollution Prevention (P2) team takes great pride in the impact we have within the borders of West Virginia since January of 2023. From energy savings to CO<sub>2</sub> reduction, the recommendations we develop for these businesses not only help these businesses improve their sustainability, but also their bottom line!

**Look at the impact of the opportunities we have found! →**

**25** Energy Efficiency/P2 Assessments

**50** Recommendations

**With Annual Savings of...**

**\$504,637** in Energy Costs

**3,654 MWh** of Electricity

**11,897 MMBtu** of Natural Gas

**3,224 Metric Ton** CO<sub>2</sub> Equivalent



## UPCOMING EVENTS



**Webinar: Improving Sustainability with the Toxic Release Inventory**

*Friday, January 31, 2025 @ 1:00 – 2:00 PM EST*

**Topic:** Join us for a discussion of the Toxic Release Inventory and how businesses can utilize the Toxic Release Inventory tools to improve sustainability.

[Register Here](#) or use the QR Code!



**Webinar: P2 Series – Pollution Prevention Best Practices for the Chemical Manufacturing Industry**

*January 27, 2025 @ 12:00 – 1:00 PM EST*

**Topic:** Save money AND the environment with these Pollution Prevention Best Practices for the Chemical Manufacturing Industry. Part 2 of a 5-part series.

[Register Here](#) or use the QR Code!



## Webinar: P2 Series – Pollution Prevention Best Practices for the Automotive Manufacture and Repair Industry

February 24, 2025 – 12:00 – 1:00 PM EST

**Topic:** Learn about opportunities to improve the sustainability and environmental compliance of Automotive Manufacture and Repair facilities while still maintaining profitability. Part 3 of a 5-part series.

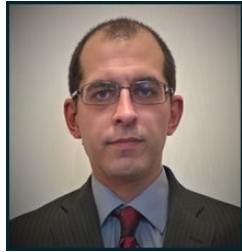
[Register Here](#) or use the QR Code!

## THE P2 TEAM

### Faculty & Staff



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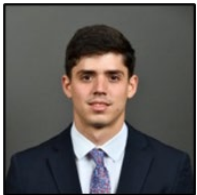


Dr. Imtiaz Ahmed  
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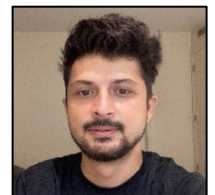
Akshay Patel



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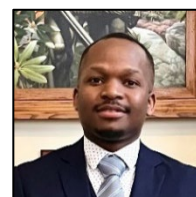
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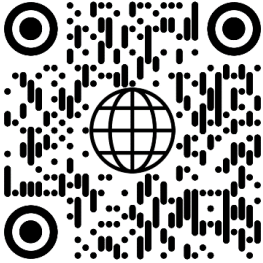
# CONTACT US

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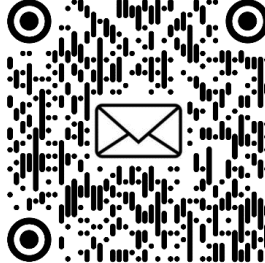
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P2 Website



Inquire about Services



Questions or Comments?