Heat Recovery System Automation & Optimization

Energy & Power Innovation Centre

FUNDER:

Ontario Centres of Excellence

INDUSTRY PARTNER:
Carbon Cap Inc.

TIMELINE:

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RESEARCH TEAM:

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KEY STATS:

There is a potential to save 15-25% in natural gas costs related to flue gas recovery if this automated system is deployed to upgrade existing residential apartment buildings in the GTHA.

Context: Hundreds of residential apartment buildings in the GTHA are using older boiler systems with an efficiency of 50-70% for domestic hot water and space heating needs. The waste flue gas produced from this process is released into the atmosphere at a very high temperature with very little being done to reclaim the energy present.

Industry Challenge: The Industry Partner has designed an innovative waste heat recovery system from flue gas produced by conventional boiler systems. The manual operation and control system needs to be automated in order to commercialize it, revolutionizing the boiler industry, and helping to offset a great deal of carbon from the atmosphere in the process.

Solution: A Programmable Logic Controller (PLC) was programmed to facilitate the automatic control and operation of the existing prototype at a mock boiler room. As part of the automation system, additional equipment was researched and installed to enable data logging and remote monitoring and control of the system.

Impact of the project: Once all safety checks have been verified, the system needs to be inspected prior to deployment at various housing complexes in the GTHA. The functional automated system can potentially provide a 15-25% savings on natural gas costs. This would invariably lead to more manufacturing jobs, training to support installation and maintenance needs, as well reducing the carbon footprint of Ontario.

Mohawk's role: Mohawk college faculty and students are experienced in the areas of PLC programming, instrumentation and control systems. The combined experience of 25+ years in these areas provided confidence to achieve the project outcomes. The success of this project allowed the faculty to showcase this expertise as well as the capabilities of Mohawk students to translate their knowledge into practical work.