



### Assessment Overview: Pratt & Whitney

A team of students & faculty from the Syracuse University IAC performed an industrial assessment for Pratt & Whitney. The assessment was sponsored by the Department of Energy (DOE), and was led by Center Director Jackie Anderson, PhD., a faculty member in the Department of Mechanical and Aerospace Engineering. In October 2022, the team conducted an assessment that considered energy, possible waste, and process related improvements. This was accomplished through analyzing larger energy consuming pieces of equipment and systems with the goal of finding energy-saving methods. The team was able to recommend 10 potential energy-saving recommendations to the facility that would result in approximately \$185,000 in annual savings.



This is an example of a solar panel array that we would recommend to the facility in this case study. Given ample roof space, a solar panel array could significantly reduce annual electricity costs for a company, allowing it to expand in its manufacturing capabilities.

*Photo from Daily, AEC. "What Are 'the Good, the Bad, & the Ugly' of Rooftop Solar Photovoltaic Systems?" ArchDaily, ArchDaily, 27 Mar. 2020, <https://www.archdaily.com/934122/what-are-the-good-the-bad-and-the-ugly-of-rooftop-solar-photovoltaic-systems>.*

#### Applications

The Syracuse University Industrial Assessment team was able to identify opportunities that decrease energy usage, increase demand capacity, and enhance quality of life at the facility for the employees. This was accomplished after conducting an assessment that examined the manufacturing process from receiving to shipping, in addition to further analyzing larger energy consuming pieces of equipment. The team’s goal was to identify significant cost-saving and energy-saving opportunities that would provide the facility with annual savings.

#### Summary

Through the Department of Energy’s Industrial Assessment Center (IAC) located at Syracuse University, this Thermal Barrier Coating manufacturer was able to realize significant savings from reductions in energy costs. Through various recommendations regarding lighting, waste heat from equipment, compressor systems, electrification, and solar energy, the company would be able to save ~\$185,000 annually.

#### Company Background

Pratt & Whitney is an American aerospace manufacturer, and a subsidiary of Raytheon Technologies. Its headquarters are in East Hartford, Connecticut, and primarily manufactures aircraft engines, in addition to gas turbines for industrial and power generation, and marine turbines. They were founded in 1925, with this location

having 237 employees, and \$78 million in revenue.

#### Points of Interest

One major problem that this facility was facing revolved around their utility company. Over the course of 2021, this facility used approximately 30,000,000 kWh, which was the limit placed on them by their utility company. This was something that limited the growth of the company as they are not able to expand or add any new equipment. Because of this, P&W asked for ways to overcome this major issue. While conventional recommendations were able to save a combined 261,965 kWh, the Syracuse University IAC wanted to evaluate other options.

The primary solution was to recommend installing a solar panel array. An array rated for 6,000 kW could possibly save 1,006,250 kWh for the facility. With the company producing over a million kWh on their own, this would allow for further expansion and growth for the company and this facility.

## Assessment Recommendations

Assessment Recommendations	Annual Resource Savings	Total Annual Savings	Capital Costs	Simple Payback
De-lamp in Over-lit areas	Electricity: 45,727 kWh Demand: 63 kW	\$4,882	None	Immediate
Pay Utility Bills on time	Avoided Cost: \$1,969	\$1,969	None	Immediate
Eliminate Use of Space Heaters	Electricity: 25,200 kWh Natural Gas: -108 MMBtu Demand: 38 kW	\$1,491	\$53	0.04 Years
Duct Compressor Waste Heat	Natural Gas: 553 MMBtu	\$6,343	\$792	0.12 Years
Duct Outside Air to Compressor	Electricity: 19,816	\$1,823	\$447	0.25 Years
Install More Efficient Lighting	Electricity: 3,924 kWh Demand: 5.376 kW Avoided Cost: \$14.13	\$433	\$284	0.66 Years
Utilize Setback Timers on Equipment	Electricity: 4,612 kWh	\$423	\$627	1.48 Years
<b>Install Photovoltaic Solar Panels</b>	<b>Electricity: 1,006,250 kWh</b> <b>Demand: 6,000 kW</b>	<b>\$158,273</b>	<b>\$259,521</b>	<b>1.64 Years</b>
Replace Electric Furnaces with a Gas Furnace Substitute	Electricity: 161,616 kWh Demand: 222 kW Natural Gas: -681 MMBtu	\$9,454	\$16,991	1.8 Years
Exhaust Equipment Waste Heat	Electricity: 1,070 kWh	\$98	\$369	3.76 Years
Total	Electricity: 1,268,216 kWh Demand: 6,328 kW Natural Gas: -235 MMBtu Avoided Cost: \$1,983	\$185,189	\$279,082	

