



**CALIFORNIA STATE SCIENCE FAIR
2017 PROJECT SUMMARY**

Name(s) Marco R. Evans	Project Number J0311
Project Title The Heat is On: Reusing and Repurposing Heat Loss from a Clothes Dryer	
Abstract Objectives/Goals My goal was to design an efficient heat exchanger to recapture the heat lost from a household clothes dryer. The recaptured heat was used to heat our laundry room. Methods/Materials I constructed a test box to measure the temperature changes of each design and measured the temperature changes with two digital thermometers. First, I tested the designs in the test box and then I tested each design in the laundry room. The problem can really be broken down into two steps; the exchange of heat from the heated dryer air to the heat exchanger and then from the exchanger to the room air. I started with the simplest design of a pipe with fins and progressed to a box that affected both the area available for heat exchange and the type of air flow. Results The greater the surface area of the design, then the more heat was exchanged. A simple pipe in the test box changed the temperature in 30 min by 12.9C, while the pipe with fins (1.7x larger) changed the temperature by 21.4C. The second design was a rectangular box which had a surface area 2.5 times greater than the pipe and raised the test box temperature by 23 C and by adding fins it raised it by 37C. Inserting baffles in to the rectangular box, created turbulent air flow that further increased the heat captured. I calculated both the heat capacity of the air in the test box and heat transfer in the laundry room. Conclusions/Discussion I was able to test 3 different heat exchanger designs that recaptured heat from a clothes dryer. Increasing the surface area increased the heat exchange and fins transferred more heat. Heat transfer was also affected by the type of air flow since the insertion of baffles lead to more heat transfer. Even though the heat exchangers captured only some of the heat from the dryer, it was enough to heat our laundry room and reuse some heat that would have been lost to the environment.	
Summary Statement I designed and tested heat exchangers to capture and reuse the heat lost from a clothes dryer to heat a room.	
Help Received Jim Evans and Bob Rosenbloom	