

Juan Palma: Hello. Our project is the self-automated smart dog house. Our team's name is EMP. The team members are Enrique Hernandez, Fernando Murillo, Carlos Ramos and Juan Palma.

Juan Palma: We chose to make this project to create a Eco Friendly Smart Dog House with a practical design catered to pets rather than aesthetics that would give them adequate care when their owners are away.

Juan Palma: The dog house will be able to run all of its components without increasing the owner's energy bill. More importantly, the dog house will not leave a considerable carbon footprint for the increased comfortability of our pets.

Juan Palma: The target audience is any one that lives with a dog. The focus is on individuals who travel, have busy schedules or simply want an improved lifestyle for their pet.

Juan Palma: There were two major problems that we noticed in other models. They were too expensive or inefficient. There are various custom built for dog houses but they did not seek to improve the wellbeing of our pets. Instead, they were simply built with more expensive material with luxurious style in mind over comfortability. There were other models that aimed to provide AC cooling to the dog house but they used generators to support the large power consumption that would not be practical with solar panels.

Enrique Hernandez: These are some of the earlier designs of our project and what we aimed to design and build. Some of the main features seen on this 3D model are the Automated water system located on the left side of the dog house where it measures accurate water level and fills tank when low. Next to the water system we have the Dog feeder system that stores food and distributes portions throughout the day based on a timer. On top of the water, we have the temperature control unit that can read real time temperatures inside the dog house and display them, as well as adjust the temp with a PID controller. The control unit located on the back of the dog house is used to troubleshoot and make adjustments to the systems. Finally on top of the dog house we have the humidifier which cools the dog house and the solar and battery which provide power to the entire Dog house with clean energy.

Enrique Hernandez: The timeline here represents our goals and plans for the semester to construct the project dog house. We first allocated 1 week to change the timeline and adjust to meet real time requirements with current circumstances surrounding society. We then gave ourselves 1 week to gather all necessary materials necessary for each component of the dog house. Once all materials were gathered, we began construction with a total of 2 weeks per system to ensure we could build and test for errors. Most components needed more materials due to errors which caused delays of ordering items to finish construction which we did not account for. The construction of the dog house was done within the allotted time as materials were easy to acquire. Once all components were finished, we assembled the dog house to display all systems as we intended.

Enrique Hernandez: The water system of the dog house was constructed with an Arduino nano unit for a compact setup to ensure all items would fit within the box unit and deal with less wires. The unit uses a 2 x 16 lcd screen to display water tank levels and show how the system is operating the water pump on/off. The LM 317 module was used for the input of voltage necessary for the system unit and distribute 5v to the Arduino and lcd screen while powering a 12v pump. Most of the circuit board components use resistors and capacitors to store and ensure power does not overload the unit to cause any malfunctions. When the water pump is below 20% of the tanks level the pump activates and begins to fill the water container until it reaches 100% capacity.

Carlos: My name is Carlos I am responsible for implementing the automated food dispenser feature of the doghouse. The feeder works by having a servo-motor open and close a lid on the food container. The servomotor is connected to an Arduino uno which controls how often the food is dispensed and the amount of food dispensed. The dispenser twice a day. The speed in which the lid opens, and closes can also be changed to control the amount of food dispensed. The longer the lid stays open the more food will be dispensed. This is useful since smaller dogs will need less food and bigger dogs will need more food.

Juan Palma: Hello, I am Juan Palma and I was in charge of the temperature control. The components that were used were a PID control, a solid-state relay with a heat sink, a k-type thermocouple and a humidifier. The way the set-up works is that we have the power supply from the solar panels connected to the relay, humidifier and PID control. The PID control receives data about the environment's temperature from the K-type thermocouple. This received temperature is compared to our desired temperature and if we are not at the desired temperature, then the PID messages the Relay to turn on the humidifier. This process is repeated by the PID control until the desired temperature is in range.

Fernando: Hello guys, I am Fernando. I was in charge with setting up a proper Solar Panel and Power supply for our automated doghouse. The off grid solar system consists of 1 one-hundred-watt solar panel, 1 charge controller, 1 12 volts battery, 2 breakers and a fused distribution block, and a power inverter. Also, 1 ground distribution block for proper grounding. I connected the design in this order: First, I connected the solar panel outputs to the solar panel inputs on the charge controller. Then, I connected the positive terminal of the battery to the charge controller and the positive of the load from charge controller to the DC fused power distribution block. Our Automated Water and Feeder require a 12-volt source which are connected to the load output of the charge controller with a fused power distribution block. The PID Controller is then connected to the inverter's AC outputs and the inverter's DC inputs are connected to the Fused power distribution block. Lastly, all of the negative terminals are connected to the battery's ground distribution block as seen on the diagram. In case of a shortage or over current, there are circuit breakers at the positive wire of the solar panel and at the positive terminal of the battery. So, with proper components, wiring and safety

precautions, the solar system installation is well built and flawless to power the automated doghouse.

Carlos: We learned that creating a renewable energy product is more complex than we initially thought. For example, we had to convert DC power to AC for the humidifier. We learned to manage our budget to keep costs low while keeping it efficient. This was difficult since solar panels are expensive but essential for making the house efficient. Because we had to work remotely, we had a few miscommunications, and we were not able to help each other as much as we would have been able to if we met up on campus every week. Meeting up and working together is essential.

Carlos: If we continue working on it, we have some improvements we would like to make. We would like to make the design more durable and aesthetically pleasing by using 3d printed materials, instead of using cardboard and plastic bottles. We would like to improve the automated feeder code and add functionality by adding a screen and having a simple user interface. We could also make it more affordable and accessible by having different sized models.

That is all for our presentation. Thank you for your time.