With the coming advent of 5G, there is a rush to develop low power IoT sensor modules. To reduce waste, teams are looking to power these devices with ambient thermal energy. In this paper, we will describe our successes with energy harvesting modules based on thermoelectric generators (TEGs) which are driven by the thermal differential between the core and surface of tree trunks, which, unlike modules based on photovoltaic cells, are both discrete and provide power during the day and night. We will also describe the progress we have made in developing XBEE networks that will collect data from sensors powered by our TEG modules.

With the coming advent of smart devices, there is a rush to develop low power IoT sensor modules. To reduce battery waste, teams are looking to power IoT devices with seebeck effect. A phenomena by which the temperature difference between two different types of conductive material produces a slight voltage difference between the two materials. In this paper, we will describe our successes with energy harvesting modules based on thermoelectric generators (TEGs) which are driven by the thermal differential between the core and surface of tree trunks. With the goal of establishing a XBEE network, creating a smart forest for IoT solutions.

With the coming advent of smart devices, there is a rush to develop low power IoT sensor modules. To reduce waste, developers are looking to power these devices with various sustainable energy sources, in our case, natural energy harvesting. In this paper, we will describe our success extracting energy from the thermal gradient between the core of a tree and the outside ambient temperature. This is possible through thermoelectric generators (TEGs) which are driven by the Seebeck Effect. Unlike modules based on photovoltaic cells, TEGs are discrete and provide power during both day and night. We will also describe the progress we have made in developing XBEE networks which collect environmental data from sensors powered by natural energy harvesting modules.