

# SPELLMAN HIGH VOLTAGE ELECTRONICS CLEAN TECH COMPETITION | 2021

## Executive Summary

### Introduction

The emphasis on Science, Technology, Engineering and Math (STEM) education focuses



on helping young people see the relevancy of STEM in their world. The Spellman High Voltage Electronics Clean Tech Competition (SHVE CTC) was developed to excite students by engaging them in STEM innovation. The competition began in 2012, and has progressed from a Singapore and California-centered event, to include over 5000 student researchers from over 70 nations by 2020. Themes have touched on a wide range of environmental impact issues, including “**Clean Water for All**” in 2013, “**Feed the World**” in 2015, and “**Solving Climate Change**” in 2018. For 2021, that theme is “**Protecting Planet Earth**” and under that umbrella there are two categories: *Low Cost* and *High Tech*.

### The Competition and Project Based Learning

The SHVE CTC is a worldwide competition to challenge international High School students to come up with a clean technology solution to the challenges put forth by the Competition committee. Students are encouraged to work in groups to come up with the most sustainable solution to each annual challenge, with Finalist teams creating prototypes of their solutions. The Finals event brings together the top 10 teams per category from across the globe, competing for one of the two \$10,000 grand prizes. In 2020, Finalists from India, the United States, Canada, Singapore, and the Philippines, competed in a virtual, live-streamed Finals with 40 total nations competing despite the COVID-19 pandemic.

It is critical that students understand how to develop solutions collaboratively. Termed “project based learning,” (PBL) educators are now learning how to implement ways to present STEM (Science, Technology, Engineering and Math) in a way that more closely mirrors what they will find in the workplace: collaborative thinking and project implementation.

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## How it Works

The SHVE CTC begins with the creation of a theme, which is then announced by email to over 30,000 teachers and educators around the globe. Teams register in sizes of 1-3 on the website, and submit a paper for the first round that is judged a minimum of three times by a panel of volunteer professionals from various STEM fields. From this list, the top 20 teams in each category are selected as semi-finalists, and the top 10 teams in each category are invited to compete at the Finals event. These 20 teams are each awarded a \$200 stipend to create a prototype of their invention, which they will present alongside their research to a panel of judges at the Finals. Each team in the Finals wins a monetary prize, and the top team in each category is paired with a Mentor that will continue to help guide them as they modify and improve their invention towards the goal of acquiring a patent.

## Engaging the Community

The competition is hosted in a different location almost every year. This helps to spread awareness of the issues the competition aims to rectify by putting the competition squarely in the cross hairs of local communities. Teachers, students and the general community are encouraged to attend. While all are invited to observe the ingenuity on display, some may be asked to serve as a judge or speaker at the event. In 2020, the Competition turned to a virtual format, with the Facebook Live streamed Finals reaching over 10,000 individuals. This experience has led the Competition to decide to live stream all future Finals events, regardless if they are held physically or virtually.

## Opportunities for Employees

We look to get as many people involved as possible, and employees of our sponsors are always a great and welcomed resource. They can be utilized for a multitude of tasks to help the competition succeed. Some may look to engage the community through their children's school, while others may host STEM workshops to educate the public, and a few are usually invited to serve as judges or mentors for the competition as well! Widespread involvement at all levels of the organizations involved is important to the competition, and helps it become a cohesive organism that has help from top to bottom.