## Problem Statement

Cyber attacks against the power grid are a growing concern.

Using CyHelics, our group is creating a virtual distribution & transmission power grid that we can simulate cyber attacks against to help showcase potential attack and defense scenarios.

## Requirements & Constraints

Current Requirements

* Use CyHelics to combine multiple substream programs and run concurrently (functional)
  + Include both power grid model analysis and cyber security focused programs
* The simulation will be capable of handling multiple attack simulations, based on the OWASP top 10. (functional)
* Create a power grid with several transmission models that connect with several distribution models and demonstrate proper power flow. (functional)
* Power Grid will include multiple load types. (functional)
* The power grid interface will be able to simulate different grid set ups (functional)
* The interface must be easy to use for non technical users. (non-functional)
* The simulation will be tested in a VM environment. (functional, maintenance)
* The user must be able to select how much of the grid they want to simulate an outage for, with specialized attacks for each one. (non-functional)
* The simulation will be integrated with cyber defense products such as Security Onion. (functional)
* The simulation will be set up in a dockerized environment. (functional)

## Engineering Standards

* Helics and pandapower uses an open source BSD-3 clause license.
* OpenDSS is open source, no listed license.
* MITRE ATT&CK Framework is an industry standard knowledge base for use in pentesting, gap assessments, threat intelligence/hunting, and more.
* OWASP Top 10 as a security guidance standard.
* Python is an industry standard interpreted scripting language.

## Intended Users and Uses

**Who benefits from the results of your project?**

The general population benefits from the project. It ensures that the companies running their power grid have substantial protection against attacks.

**Who cares that it exists?**

Power grid companies, city planners, maintenance companies, city politicians, city citizens, researchers.

**How will they use it?**

* Find weaknesses
* Improve their grid
* Test future expansion