



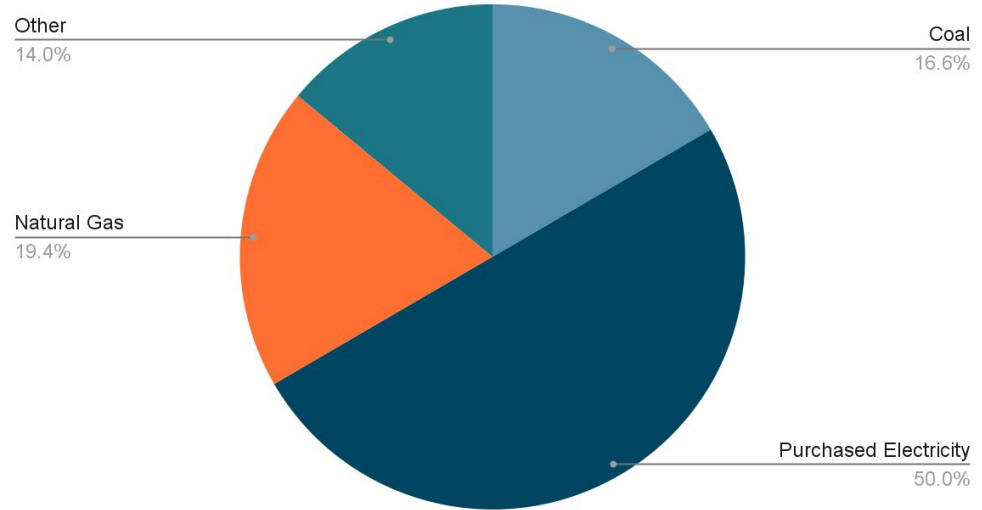
# SDG Group Project

Taha Shaikh & Rida Subzwari  
Dec 2021

# Background

- Since 2014, Virginia Tech dining services has handled roughly 7.1 million meals per year
  - Only 0.6% of these meals have been served in reusable to-go containers since 2014

Virginia Tech Energy Use in 2019



- Virginia Tech contributed about a quarter of a million tons of CO<sub>2</sub> in 2019
- Energy intensive buildings on campus account for 70% of main energy cost
  - Ex. Squires Student Center, McBryde Hall, etc.
  - Currently, these buildings aren't powered using renewable energy

# Key Stakeholders

**Location:** Blacksburg, VA (Virginia Tech Campus)

**Target Group:** Students/faculty with on-campus dining meal plans

**Stakeholders:** Virginia Tech administration, dining services suppliers/manufacturers, waste management

# Non-biodegradable Plastics

- Virginia Tech uses 7 types of plastics in containers and disposable silverware
  - #3-7 cannot be recycled and are dumped in landfills
- How can these plastics be reused and recycled instead of going directly into the trash?



# Project Goals & Initial Idea

- Our main aim is to address waste caused by non-biodegradable plastics used by Virginia Tech dining.
  - These plastics generate a huge carbon footprint and is a leading contributor to material pollution from campus.
- Our initial idea is to provide a service in which non-biodegradable plastics can be recycled and used in the context in dining services at Virginia Tech

Non-biodegradable plastics collected by students and staff for 3D printing

Fed into Plastic Pulverizer, plastics are sanitized and ground up into filament

Filament used to 3D print plastic utensils or personal projects using mobile app or software

# Initial Idea



# Team Roles & Competences

- Rida – Industrial Systems Engineering
  - Service integration within VT Dining
  - System design overview
  - Economic viability assessment
    - Research, filament
  - Administrative feasibility
- Taha – Computer Engineering & Mathematics
  - Technical design of plastic pulverizer
  - Creating potential 3D models for printing and reuse
  - Computer Engineering can be used for designing a platform or mobile application for someone to print a personal item or 3D utensils/cookware

# Critical Ideas

1. Circles of Sustainability
  - a. Project is capable of improving economic, political, ecological, and cultural aspects of VT Dining
2. Culture of Sustainability
3. Creative Practices
  - a. Has potential to inspire people to turn trash into creative, functional items rather than tossing them
  - b. Spread to other schools and dining halls can improve how waste is managed on a smaller scale
- 4.

# Opportunities, Metrics, & PR

- Success for this project looks like:
  - Less material waste (landfill) coming out of dining halls
  - Increased use of Plastic Pulverizer & money saved on 3D printing filament
- Students can share their recycled projects and receive meal plan credit for large number of uses or particularly innovative model designs
- 3D printing in Kelly Hall and student labs can be leveraged to give students more opportunities to print projects
- Showcase interesting projects in dining halls near trash receptacles to get the word out about recycling trash and creating interesting products