

## **Thesis Portfolio**

Technical Thesis: The effect of policy making on America's perception on climate change urgency and renewable energy adoption  
(Technical Report)

STS Thesis: Complexity of American Climate Politics and Public Numbness on transitioning to a Renewable Energy Society  
(STS Research Paper)

An Undergraduate Thesis

Presented to the Faculty of the School of Engineering and Applied Science  
University of Virginia • Charlottesville, Virginia

In Fulfillment of the Requirements for the Degree  
Bachelor of Science, School of Engineering

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Department of Electrical and Computer Engineering

## **Table of Contents**

Sociotechnical Synthesis

Technical Report Title

STS Research Paper Title

Thesis Prospect

**Sociotechnical Synthesis**

The complex nature of the American political system on climate change and the resistance for our society to adopt more renewable energy and transition to a clean society necessitates a further analysis. With top climate scientists and multinational agency confirmation that impending four-degree Celsius emissions tipping points will cause warming inevitability and lead to irreversible effects, it is more evident than ever that severe impacts that will affect future generations, needs to be stopped. Data was collected from a case study based on the 2021 Texas extreme winter storm power outages where both qualitative and quantitative evidence was used to determine the root causes for societal numbness towards climate action, as well as the complexity in the politics surrounding the topic.

The STS and technical papers are not related, but are both heavy recent events in the past year with high value. The automated temperature tracking door locking system designed and constructed by my technical capstone team is a device that denies entry through a door to a person whose body temperature falls within an unsafe or potentially ill temperature range. A person who wishes to seek entry through a door will first approach the device and place their wrist underneath the scanning-area, which will simultaneously allow a motion detector to awake the system as well as sense the body temperature through a medical grade temperature sensor. After the temperature data is sent to a server via Bluetooth connection to be analyzed and stored in a database, the door will then decide whether to unlock itself to the person depending on their recorded body temperature. In addition to the temperature locking device's ability to deny entry to potentially unwell users, the database will be readily available for system owners to view through a private webpage and will show the number of user entries or denials and their associated temperatures. Societal and ethical concerns largely arise from privacy concerns attached to temperature data for user entry. Privacy laws indicate that temperature systems that deploy facial recognition scanners or collect personal information are privacy breaches, but the system aimed to be created strictly takes in numerical temperature data without a person's name attached. Another societal concern is that the webpage database for system owners could allow data to be traded, but can be alleviated through the fact that personal data is not stored. Finally, since the door locking mechanism requires the door to be locked by default, societal concerns could arise in terms of safety hazards and is a technical issue that should be further examined. The technical subject of the STS prospectus and the technical topic for the Department. of Electrical and Computer Engineering is not related.