The United States lacks efficient separation of waste materials and recycling methods, resulting in an environment that generates more waste than able to maintain. Landfills contribute to pollution, carbon emissions, and other environmental hazards that are detrimental to future generations. Along with this issue, the demand for energy is projected to increase with our current growing population, therefore, repurposing waste to energy is a resourceful approach to addressing the landfill crisis. My technical project attempts to reduce the amount of waste sent to landfills by repurposing it to act as a feedstock to generate electricity, while my STS project delivers knowledge that can be a basis for explanations into how specific waste management approaches might not be conducive for certain countries or regions. My technical project delivers a design of a power plant that can convert the municipal solid waste generated in the city of Boulder, CO, to electricity that can power it (the city). My STS project offers a study of how Rwanda has approached curbing plastic waste, and by doing so, explains why an approach to curbing waste, such as implementing the power plant designed in my technical project, is only an effective approach for some countries and not for others.

Municipal solid waste is made of molecules that can generate electricity. For my technical project, my team and I designed a power plant that processes municipal solid waste from Boulder, CO in multiple gasifiers to produce syngas, which is then fed to a solid oxide fuel cell coupled with a Rankine cycle to generate electricity. A lot of carbon dioxide was generated within our process to produce electricity, and it was captured using a stripper and an absorber, and then stored underground.

For my STS project, I relied on Rwanda's radical management of plastic waste to show how waste management approaches taken by some countries might not be feasible for other countries. Since 2008, Rwanda, a developing country in the East African region, has placed an

almost total ban on plastics. In the country, the importation, sale, and use of plastic bags is generally illegal and traffickers caught having illegal plastics are liable and can be fined or even jailed. Countries all over the world have been encouraged to adopt similar policies on the use of plastics as doing so has positively impacted the country's economy and overall development. However, without proper knowledge of the forces responsible for the successful implementation of Rwanda's zero tolerance policy on the use of plastics and how they influence one another in doing so, groups concerned about the effects of using plastics and how to restrict them remain inadequately informed about the level of applicability of Rwanda's approach in other countries around the world. The forces responsible for Rwanda's approach can be analyzed using the STS framework of actor-network theory. More details about these forces and how they interact will be presented, helping the reader determine if their (the forces) respective nature and interaction is the case for other countries or regions that are advised to consider implementing Rwanda's anti-plastic approach.

Both my STS and technical projects were related by the fact that they both contribute to the discussion about how to properly manage waste to reduce the amount of it that is sent to landfills where it contributes to pollution. My technical project delivers an approach that converts waste to a useful material in energy, while my STS project provides some insight into the feasibility of implementing such an approach in certain countries or regions. Coupling knowledge from both my technical and STS projects supports the conclusion that countries with varying sociotechnical dimensions have to employ varying approaches to managing waste.