

**Thesis Project Portfolio**

**Ukraine Food Crisis: Understanding the Impacts of War on the Global Supply Chain and  
Applying to Future Events**  
(Technical Report)

**The Economic Impact of the Russian Invasion of Ukraine on the Energy Market in The  
European Union**  
(STS Research Paper)

An Undergraduate Thesis

Presented to the Faculty of the School of Engineering and Applied Science  
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In Fulfillment of the Requirements for the Degree  
Bachelor of Science, School of Engineering

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## **Sociotechnical Synthesis**

My Capstone research project is focused the Russian invasion of Ukraine and understanding how a wide spectrum of compounding has contributed to the global food crisis. The focus of this paper will be to understand the impact that a military invasion has on a major global food exporter and the countries that it supplies. The end goal of this analysis is to have an understanding of how to prepare for future global catastrophe, and be proactive in mitigating food crises around the world. The human and social dimensions are important to consider because each country within the EU has varying resources and trade relations, and thus will be impacted by this crisis differently. Ukraine is a major global food exporter but as the Russian invasion of Ukraine drove food production down, countries that relied heavily on Ukraine for their food supply, needed to find alternative sources. Not all countries are able to keep up with skyrocketing prices from these other food sources, increasing food insecurity. My STS research paper focuses on the European energy crisis related to the food crisis through the natural gas role in fertilizer production. Susan Leigh Star describes properties of infrastructure as being as much of a part of our human organization and just as problematic and complicated as any other organization. The specific properties, infrastructure becomes visible upon breakdown and that it embodies existing standards, will be focused on to analyze the how the Russian Invasion and energy crisis has exposed the disparity in energy security and investment in energy infrastructure between countries in the European Union and how countries have suffered economically. The methods that will be used to conduct my research include data analysis of natural gas price, countries storage capability, and the reliance of energy sources on Russia pre-invasion. This data is coming from the International Energy Association (IEA), the European Commission, and the World Bank. Case study research will also be conducted to understand the reaction to the crisis and success of Germany, France, Estonia, and Hungary in storing energy and reducing high

energy prices. I expect to find that wealthier countries have more ability to invest in energy storage infrastructure and build new terminals to bring in LNG and also have the ability to buy the higher prices, thus able to keep energy prices lower and faring better economically. Whereas, poorer countries unable to diversify sources of energy through infrastructure investment will have to continue to increase energy prices and have suffered greater economically. This thesis will have a deeper understanding of how to prepare for future global catastrophe, and be proactive in mitigating food and energy crises around the world.