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**BEATING THE RED GOLD RUSH: COPPER THEFT
AND HOMELAND SECURITY**

by

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December 2015

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SECURITY**

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Submitted in partial fulfillment of the
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ABSTRACT

This thesis is a comparative case study comparing and contrasting the efforts of three countries (United Kingdom, France, and Italy) in their fight to reduce copper wire theft incidents within their nations. The ultimate goal of the research is to highlight the significant threat posed to critical infrastructure from copper thieves and to offer best-practice recommendations to policymakers within the United States in response, based on the experiences of the three targeted nations. An analysis of the data reveals that the United Kingdom has had the most success in the reduction of reported copper wire theft incidents, primarily due to its multi-faceted approach to the problem, which includes heavy regulation of the scrap recycling industry, centralized law enforcement operations, and enhanced criminal statutes.

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LIST OF ACRONYMS AND ABBREVIATIONS

BART	Bay Area Rapid Transit
BMRA	British Metals Recycling Association
BTP	British Transport Police
CPF	Compagnie Francaise des Ferrailles
COPE	Community Oriented Policing Enterprise
DHS	United States Department of Homeland Security
DOE	United States Department of Energy
ENA	Energy Network Association
FAS	Federation of American Scientists
FBI	Federal Bureau of Investigation
FEDEREC	French Federation of Recycling Enterprises
FSI	Ferroviedello State Italiana
EuRIC	European Recycling Industries Conference
ISRI	Institute for Scrap Recycling Industries
NARC	North American Reliability Corporation
NCIC	National Crime Information Center
NICB	National Insurance Crime Bureau
NRC	National Research Council
NWC	National Water Commission
OCLDI	Central Office for Combating Mobile Criminality
POLFER	Italian Railway Police
RFI	Rete Ferroviaria Italiana
SEA-TAC	Seattle-Tacoma
SNCF	French National Railway
USC	United States currency

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I. INTRODUCTION

A. INTRODUCTION

How does the theft of copper wire affect homeland security? At first glance, it appears the two subjects would not be inter-connected with each other in any meaningful way; however, further analysis leads to the conclusion that copper wire theft incidents in the United States can have an extraordinarily detrimental effect on homeland security. The U. S. Department of Energy estimates that copper wire theft causes approximately \$1 billion dollars' worth of damage every year in the United States to facilities and businesses deemed by the government to be critical infrastructure.¹

As far back as 2008, the Federal Bureau of Investigation (FBI) reported that the theft of copper wire in the United States had a variety of detrimental effects, including impeding the “flow of electricity, telecommunications, transportation, water supply, heating, and security and emergency services.”² The FBI further concluded that copper theft constituted a risk to public safety and national security.³

The copper wire theft problem is not confined to one community, region, or state; instead, it is a problem that touches every corner of the nation. Every single part of the United States has been adversely affected by copper wire theft issues, particularly as the price of copper on the open market reached historic highs between 2010 and 2012. In order to find ways to effectively mitigate the problems associated with copper wire theft, policymakers and law enforcement practitioners in the United States must examine methods and practices undertaken by other nations to discover best practices in their efforts against copper wire theft.

¹ Brady Mills, “Metals Theft: Is This Billion Dollar Crime on Your Radar?” *National Sheriff Magazine*, September–October 2014, <http://www.isri.org/docs/default-source/scrap-metals-theft/sheriff-magazine-feature-article-september-2014.pdf?sfvrsn=2>, 12.

² “Copper Theft Threatens U.S. Critical Infrastructure,” Federal Bureau of Investigation, September 8, 2008, accessed September 6, 2015, <https://www.fbi.gov/stats-services/publications/copper-thefts>.

³ *Ibid.*, 1.

1. Problem Statement

Copper wire theft is an issue that can potentially have extraordinarily adverse implications for critical infrastructure assets located throughout the United States. Conservative estimates, as referenced earlier, place the overall financial losses to corporate and government entities within the continental United States at approximately \$1 billion a year.⁴ In addition to financial losses to private entities, copper wire theft can also disrupt or destroy varied pieces of critical infrastructure, including railroads, the electrical grid, hospitals, public communications, and a wide variety of other public utilities.⁵ Even seemingly minor instances of copper wire theft can have major implications, such as in early 2013 when two thieves stole approximately 7,200 feet of copper wire from Federal Aviation Administration property at the Seattle-Tacoma International Airport, disabling runway approach lights and seriously threatening the safety of aircraft using the facility.⁶

Currently, there are no coordinated mechanisms in place to determine the exact amount of copper wire theft incidents that have occurred in the United States. None of the prevention and enforcement methods that have been developed and deployed within the United States have proven effective at deterring incidents of copper wire theft. Unless a new strategy is developed, the United States likely will face an ever-increasing amount of copper wire theft, similar to that which has occurred within the European Union over the past 20 years. There are no elements within the United States homeland security environment to date that have undertaken a significant examination of the success or failure of European Union nations to combat the ever increasing problems associated with copper wire theft.

⁴ Mark Koba, "Copper Theft 'Like an Epidemic' Sweeping US," *CNBC*, July 30, 2013, accessed May 1, 2015, <http://www.cnbc.com/id/100917758>.

⁵ "Precious Metal: Copper Theft Threatens U.S. Infrastructure," Federal Bureau of Investigation, December 3, 2008, accessed May 1, 2015, https://www.fbi.gov/news/stories/2008/december/copper_120308.

⁶ "Two Charged for Copper Wire Theft at Sea-Tac Airport," Federal Bureau of Investigation, June 18, 2013, accessed May 2, 2015, <http://www.justice.gov/usao-wdwa/pr/two-charged-copper-wire-theft-sea-tac-airport>.

2. Research Questions and the Chapters

What are effective methods that have been deployed in other nations to reduce the amount of copper theft incidents involving critical infrastructure, and are there lessons that can be derived from these methods and applied in the United States to reduce the incidents and scope of copper wire theft?

In order to answer those questions effectively, each chapter in this thesis plays a specific role. In this introductory chapter, the problem, research methodology, and a review of the literature related to the topic are outlined. Chapter II presents a deep exploration of the worldwide extent of the copper theft problem followed by a thorough exploration of the current problem in the United States and its linkage to the homeland security enterprise. Chapters III, IV, and V contain detailed case studies of three different European Union nations (France, Italy, and the United Kingdom) that have extensive experience confronting the extensive issues cause by copper wire theft. Chapter VI is comprised of a detailed analysis of the results of the three case studies presented earlier, as well as an analysis of how the lessons learned from each case study can be applied to current and potential future policies in the United States. The final chapter, Chapter VII, contains specific conclusions and key findings related to the thesis, as well as policy recommendations for the United States.

3. Research Design and Methodology

The research design utilized for this project is the “multiple case studies” technique. Research for this thesis included a structured focus comparison of three nations and their enforcement and prevention strategies related to copper wire theft. The three-nation sample provided the opportunity to critically analyze different strategies in varied environments that could be replicated in the United States.

Prior to determining viable options for the United States, it was first essential to explore the successes or failures other nations have experienced as they designed and implemented policies and programs specifically for the purpose of combating copper wire theft. A strong effort was made to identify three countries in the European Union

that designed and implemented different types programs and approaches, as well as identifying nations that experienced varied levels of success addressing the problem.

Ultimately, the three countries identified for the project were the United Kingdom, France, and Italy. Each country has had over a decade of experience in its attempts to combat rising levels of copper wire theft. Most importantly, each country was found to have implemented policies and approaches unique to its nation, which led to varying results and conclusions that demonstrate a variety of options to policymakers and homeland security practitioners in the United States.

Comparing the criminal justice efforts of three different countries can be very difficult, especially in the light of the fact that there is no standard method of capturing statistical data related to copper wire theft. Each country analyzed in this thesis has a different method of maintaining data related to copper theft and different internal organizations that are tasked with combating the problem. As such, it was imperative to develop metrics that could be easily applied to all three countries to effectively interpret which countries were successful and which were failures. Each of the metrics chosen for this project can be objectively applied to each nation that was studied.

The first metric involves ascertaining whether or not legislative changes were implemented specifically to increase regulation of the legitimate scrap recycling industry. Each of the three countries selected for the case study is a democracy that relies on a parliamentary system of government. Additionally, each of the three countries is capitalistic in nature and relies on a variety of regulatory measures to control commercial interests within its respective nation. In effect, each country relies on relatively the same method to propose legislation, pass legislation, and implement new regulatory measures with relation to industries operating within its borders. Therefore, the legislative change metric can be applied without bias to each case.

For the same reason, this researcher developed a second metric that examines whether or not enhancements to criminal law were made to increase the level of punishment associated with copper theft offenses. Each nation's legal process operates in a manner similar to the other two nations, and enhancements in nationwide criminal

statutes have evolved from measures implemented within the parliamentary styles of government. As such, the criminal penalty metric can be applied equally to Italy, France, and the United Kingdom.

The third metric evaluates changes within each nation to its criminal justice strategy that afford its law enforcement agencies the ability to become more effective at copper theft enforcement. While each nation examined relies on different approaches to criminal justice efforts, each nation is heavily reliant on a combination of national and local police forces to enforce criminal laws within its borders. While each country has different agencies, the basic structure of large national police forces supplemented by small regionally controlled forces is present in all three case studies. Therefore, the metric can be applied equally to all nations, regardless of the specific internal structure of the agencies.

The final metric is the most difficult of the four to evaluate impartially simply because of the varied method in which criminal justice statistics are captured and reported by each government. The last metric is a measurement of whether or not there were measured reductions in the amount of incidents of copper theft reported following the implementation of the various initiatives through analysis of a variety of different reports, including government publications, media stories, and industrial reports. There is no standardization of reporting across all three nations, and the case study analysis is heavily reliant on figures published by a variety of different entities in each country; however, it is still possible to impartially evaluate the efforts of each nation against the other two nations by examining the available pertinent statistics regarding copper theft.

To effectively measure the success of each nation within the four specified metrics, the researcher developed a rating scale to evaluate each individual category. The rating scale is simple in nature and places each metric on a scale between 1 and 5. For all four metrics, 1 is representative of the least success in achieving the goal of the metric, and 5 is representative of the most success. An explanation of the ratings for each metric follows.

- A. Increased regulation of scrap recycling industry:
 - 1. No legislative proposal for enhanced legislation.

2. Proposal for enhancements but no legislative approval.
 3. Legislative approval for enhanced regulation.
 4. Approval and implementation of enhanced regulations.
 5. Approval, implementation, and resulting in documented reduction in theft.
- B. Legal changes to criminal statutes:
1. No legislative proposal for increased penalties for copper theft convictions.
 2. Proposal for enhancements but no legislative approval.
 3. Legislative approval of enhanced penalties.
 4. Approval and implementation of enhanced regulations across entire nation.
 5. Approval, implementation, and resulting in documented reduction in theft.
- C. Changes to criminal justice strategy:
1. No change in enforcement efforts and tactics.
 2. Documented examples of enhanced cooperation internally.
 3. Creation of national task force specifically related to copper theft.
 4. Centralization of copper theft operations under one law enforcement component.
 5. Centralization of operations and involvement in international operations.
- D. Measurable reduction in copper theft incidents:
1. Increase in copper theft incidents.
 2. No change in amount of incidents as a result of initiatives.
 3. Reduction of less than 50 percent for reported incidents.
 4. Reduction of more than 50 percent for reported incidents.
 5. Reduction of more than 50 percent for reported incidents, independent of copper commodity price index.

While it is difficult to validate the success of one independent nation over another, the metrics that have been developed for this thesis allow for an impartial evaluation of the efforts of each nation based on quantifiable metrics.

Prior to undertaking the case study analysis, it was first necessary to undertake a comprehensive examination of available literature and research specifically related to the problems associated with copper wire theft.

B. A REVIEW OF THE LITERATURE

Over the past 10 to 15 years, there has been a marked rise in the number of copper and precious metal thefts from industries in the United States and throughout the world. The law enforcement community has attempted with great effort to understand the underlying causes for metal theft and develop ways to combat the problem. The primary driver behind the anti-metal theft campaign has been law enforcement entities operating inside the European Union that coordinate their activities using with international organizations such as Interpol, Pol Primett, and the United Nations.

European agencies have made great strides combating the problem on their continent. They have also been successful at increasing public awareness and engaging political entities in the fight against precious metal theft by linking the issue to the hot topic of terrorism. Researchers have demonstrated that precious metal thefts from various critical infrastructure facilities could have dire consequences for the citizens of Europe, as well as their overall economy.

Unfortunately, the increased awareness of precious metal theft from industrial sources has not made its way into the homeland security lexicon of the United States. Little thought has been given by researchers to the problems that concentrated metal theft could cause to the critical infrastructure of the United States. While private entities, such as electrical firms, have published documents highlighting the danger of metal theft, very little coordinated action has been taken by law enforcement and governmental bodies to solidify security measures and fully explain the problems that society could face as a result of metal theft.

The majority of research within the United States has been funded and conducted by private organizations. Within the last five years, however, law enforcement agencies have begun to work together to solve the ongoing metal theft epidemic, and a variety of sources have highlighted the success of public-private partnerships in reducing metal

theft. Additionally, a variety of researchers have begun to publish literature expounding upon the unintended consequences of metal theft and the overall vulnerability of critical infrastructure assets within the United States.

This literature review explores four items associated with copper wire and precious metal theft from critical infrastructure: a definition of key concepts, an exploration of the impact of copper and metal theft on homeland security, the unintended consequences of copper and metal theft, and solutions for combating copper cable theft.

1. Defining Key Concepts

The issue of the effect of precious metal theft on critical infrastructure is a difficult topic for many outside of certain industrial circles to understand. As a result, many governmental organizations and private entities have gone to great lengths over the past five years to push literature out to law enforcement organizations, private trade groups, and political entities. The majority of the documentation is designed to simplify the concepts associated with precious metal theft and relate them to more easily understood types of crime and terrorism. For instance, a significant report published by the U. S. Department of Energy in 2010 sought to provide a brief synopsis of the issues faced by electric companies in the United States when they are targeted by copper wire thieves.⁷ The report was clearly designed to provide policymakers in the United States a broad overview of the potential economic catastrophe to the electrical grid that could result from a large-scale theft operation. Unfortunately, the report focused only on the financial implications of metal theft and included no detailed exploration of the overall homeland security implications of the topic.

A variety of other sources have tried to present the homeland security implications of metal theft, albeit it in a very limited manner. The National Research Council (NRC) in 2012 and published through the National Academies Press undertook the publication of a primer on the terror implications associated with an attack on the electrical grid. In the final report, the NRC noted how the private industry has spent years preparing for a comprehensive terror attack on the electrical system within the United

⁷ P. A. Baker et al., "The 'Red Gold' Rush and Severe Electrical Burns," *Burns* 34 (2007): 885–887.

States.⁸ While the report highlighted measures that would be taken in the event of a coordinated terror attack, it lacked the imagination to address other issues, such as metal theft, which could have an equally damaging effect on the electrical grid. The report is valuable for the purposes of this research because it outlines the broad effects of a disruption to the electrical system. The research developed in the report could easily be extrapolated onto other forms of disruption, including attacks from metal thieves.

Aside from the Department of Energy report and the report funded by the National Research Council, there are multiple other documents and research pieces that can be utilized to define the key concepts associated with precious metal theft. Most of the research has been published by private entities. For example, the North American Reliability Corporation, an organization founded and funded by large private utility support corporations, funded a research piece authored by Louis Dabdoub in 2011 that focused strongly on the economic impact of copper wire theft on the electrical grid.⁹ While the piece was heavily slanted towards identifying private means to combat the issue of wire theft, it did conceptually identify the link between copper wire theft and a disabling of utilities to provide an adequate power supply to the citizens and industry of the United States.

Jasvir Gill's research piece, also funded by the North American Reliability Corporation and published in 2011, expounded upon the data in the Dabdoub piece by further clarifying the link between copper wire theft and catastrophic electrical grid failure.¹⁰ Gill's research requires critical examination, however, because his stated goal within the piece is to advance a series of defense measures to utility providers from a corporation he owns and operates.

⁸ National Research Council, *Terrorism and the Electric Power Delivery System* (Washington, DC: National Academies Press, 2012), http://www.wiresgroup.com/docs/reports/WPF_Terrorism%20and%20The%20Electric%20Power%20Delivery%20System.pdf.

⁹ Louis Dabdoub, *Electrical Facility Threats and Violence*, North American Reliability Corporation, October 20, 2011, accessed September 30, 2014, http://www.nerc.com/files/6_Dabdoub_10-20_v2.pdf.

¹⁰ Jasvir Gill, *Continuous Monitoring: A New Approach to Secure Critical Infrastructure* (Atlanta, GA: North American Reliability Corporation, 2011, accessed October 1, 2014, http://www.nerc.com/files/5_Jasvir_Gill_AlertEnterprise_Continuous_Monitoring_V1.0.pdf.

Overall, the available literature designed to identify the key concepts associated with precious metal theft is not substantial. The pieces included in this review account for approximately 70 percent of the research currently available directly related to the topic. Further research is necessary within this subtopic to define fully the key concepts in terms easily understood by policymakers and law enforcement leaders.

2. Exploring the Impact of Copper and Metal Theft on Homeland Security

The amount of usable research currently in the field that explores the impact of copper and metal theft on homeland security is far less extensive than the key concepts section. There has not been a significant amount of analysis regarding the specific effect of copper and metal theft on homeland security. Furthermore, a review of the research available indicates that the issue has not meaningfully affected the organizations charged with defending the United States homeland.

The only major government document specifically tied to the issue was published in August of 2011, shortly before the 10-year anniversary of 9/11. The report, issued by the Department of Homeland Security, was directed at governmental entities and private interests with a vested interest in homeland security infrastructure (e.g., electrical grid, railroads).¹¹ The document is incredibly short, and as with most governmental bulletins, is lacking in substantial detail and is devoid of notations listing additional resources. When the document was published, the Department of Homeland Security (DHS) put those industries and agencies responsible for protecting critical infrastructure on notice that DHS viewed copper theft as a clear and present danger to the homeland security apparatus.

In the years following the release of the Department of Homeland Security report, multiple other federal, state, and private organizations have published documents highlighting the extensive problems associated with copper wire theft and their associated

¹¹ “DHS Warns Copper Thefts on the Rise,” *Homeland Security News Wire*, August 18, 2011, accessed June 1, 2015, <http://www.homelandsecuritynewswire.com/dhs-warns-copper-thefts-rise>.

costs. Many of these reports are similar in nature to the DHS report and merely highlight the problem rather than proposing intervention strategies.

Shortly after the publication of the DHS report, researchers tied to the electric industry began publishing pieces describing the actual damage that could be wrought by a series of concentrated copper wire thefts. For example, Douglas Carpenter and Richard Prevost, writing for a publication called *The Electricity Grid* in 2012, surmised that the nationalization of the electrical grid of the United States would produce a better overall security plan for the industry.¹² Carpenter and Prevost provided no comprehensive research to support their theory; however, the value of their work lies within the extensive discussion of how ill equipped the electrical industry is to fending off a major attack. The piece went on to describe the ramifications of a coordinated attack on the grid, including estimated financial losses and likely civilian casualties. Carpenter and Prevost's work is the only private research to date that discusses in detail the vulnerability of the electrical grid in the United States.

In order to explore the homeland security ramifications of a strike on the electrical grid of the United States, it is also necessary to examine what measures have been introduced in Europe to combat similar problems. The European Union and its plethora of law enforcement organizations are far ahead of the United States in recognizing and identifying the threat to infrastructure from precious metal thieves. Furthermore, many countries in the European Union have passed measures with enhanced penalties for criminal convictions that identify copper thieves as terrorists.

Founded in early 2010, Pol-Primett is the largest organization created to address copper wire theft in the European Union. In 2015, the organization was comprised of law enforcement, intelligence units, and private industrial partners from eight member nations, including the United Kingdom, France, Italy, Portugal, Spain, Bulgaria, Greece, and Poland. Pol-Primett has published perhaps the most extensive anti-copper wire theft document currently available to researchers. The document, titled *Metal Theft: An Emerging Threat to Europe's Economic Security*, not only detailed the overall effect of

¹² Douglas Carpenter, and Richard Prevost, "Toward Further Development of the U. S. Electrical Transmission System: My Grid, Your Grid, Our Grid," *The Electricity Grid* 25, no. 6 (2012): 10–20.

copper theft on critical infrastructure, it also provided a blueprint for how public-private partnerships could attack the problem through a variety of means.¹³ In addition to the extensive research provided by the organization, the document also provided a detailed listing of subject matter experts and governmental documents available from each of the member nations.

In order to articulate the threat to the United States homeland effectively, further research will need to be obtained from European governmental sources as well as members of the Pol-Primett organization. Pol-Primett has paved the way for researchers in the United States to devise ways to begin notifying policymakers of the potential threat to the homeland, as well as best practices from an organization with an extensive experience combating the issue of precious metal theft.

It is difficult to estimate the exact number of research pieces available from foreign organizations and governmental bodies as there is no dedicated clearinghouse for publications of that nature. Extensive research is needed accessing each of the country's governmental library databases to overcome the lack of research in the United States.

3. Unintended Consequences of Copper and Metal Theft

The most thoroughly researched section of the current research problem is the section regarding the unintended consequences of copper and metal theft. Research has already been proffered in the two previous sections that demonstrated that one of the major consequences of copper and metal theft is the overall threat it creates for critical infrastructure within the United States and the European Union. What about the other consequences of copper and metal theft?

One of the most interesting unintended consequences identified is the threat to the public health system. Multiple researchers in the medical industry have published pieces in journals as diverse as the *American Journal of Forensic Medicine and Pathology* and *Burns*. Writing in *Burns* in 2007, P. A. Baker et al. clearly identified that those

¹³ Pol-Primett, "Metal Theft: An Emerging Threat to Europe's Economic Security" (draft, Pol-Primett, United Kingdom, 2013), <http://www.agenformedia.com/assets/files/pdf/Pol-PRIMETT%20Research%20Paper%20February%202013%20Version%206.pdf>.

individuals intent on stealing copper cable from electrical plants and railroads risked severe, life threatening, burns and injuries each time they attempted to do so.¹⁴The premise of the research of Baker and his associates was also explored by Allison Taylor and her research partners in a 2003 piece titled “Death During Theft from Electric Utilities.” In their research, Taylor and her companions noted the marked rise in electrical burn cases reported by hospitals in the United States over the previous 10 years.¹⁵

While research on burn victims certainly does not directly support the hypothesis that precious metal theft is a threat to homeland security, it is valuable in the sense that it can be presented to policymakers so they can foster a greater understanding of the inherent dangers associated with such crimes. Further research is needed to directly tie electrical burns sustained during a criminal operation to an actual threat to the homeland security of the United States.

Aside from the topic of unintended consequence of burn victims, the British House of Commons Transport Committee has published the only relevant piece regarding the impact of copper wire theft on railroads. While no extensive research has been published cataloging the damage caused to United States railroads by copper thieves, the British government produced a report both highlighting the number of reported theft incidents along with the consequences of large scale theft.¹⁶ It should be noted that the research compiled by the House of Commons applies directly to private entities, as railroads operating within the United Kingdom’s boundaries were privatized between the years of 1994 and 1997.

The House of Commons research is valuable as it provides a framework that can be adapted for an exploration of copper thefts from United States railroads, the bulk of which are owned by private corporations. The British report established the direct and indirect costs of copper wire theft, as well as the overall damage caused to the

¹⁴ Baker et al., “The ‘Red Gold’ Rush and Severe Electrical Burns,” 885–87.

¹⁵ Allison Taylor et al., “Death during Theft from Electric Utilities,” *American Journal of Forensic Medicine and Pathology* 24, no. 2 (2003): 173–76.

¹⁶ House of Commons, Transport Committee, *Cable Theft on the Railway*, 14th report (2012), 1–23, <http://www.publications.parliament.uk/pa/cm201012/cmselect/cmtran/1609/1609.pdf>.

transportation network.¹⁷ Executives from Network Rail, the primary owner and operator of rail infrastructure in England, Wales, and Scotland, stated at a hearing that they had sustained direct costs of nearly £43 million pounds associated with copper wire theft between the years of 2008 and 2011.¹⁸ Network Rail officials also estimated that approximately 3.8 million passenger journeys on rail in the United Kingdom were disrupted or cancelled in 2011 as a result of copper wire theft incidents. The indirect costs to the overall economy of such disruptions are nearly incalculable.¹⁹ The research could have gone further and explored some of the more minute details of disruption, including delays to passenger train and freight trains, and the overall impact of such delays on the economy as a whole.

To better understand the effect of copper wire theft on United States railroads, it is necessary to conduct research that examines the amount of reported criminal cases, the actual monetary damages resulting from theft, and the direct and indirect results to the overall economy of the United States. Researchers should also review documentation from the U. S. Department of Transportation, the Federal Railroad Administration, and the Surface Transportation Board, as well as the private advocacy group called the American Association of Railroads. The only way to clearly demonstrate the threat posed by copper thieves to United States' railroads is to explore actual data that has already been collected by those entities.

In addition to the economic disruption caused to railroads by copper thieves, there has been additional research into the unintended consequence precious metal thieves have on the overall costs associated with the products they steal. A piece published in the *Journal of Research in Crime and Delinquency* in 2014 hypothesized that copper thieves directly impacted the overall economy by skewing the price of the commodities they stole within the legitimate marketplace.²⁰ The research noted that fluctuations in the price

¹⁷ Ibid.

¹⁸ Ibid., 8.

¹⁹ Ibid.

²⁰ Aiden Sidebottom, Matt Ashby, and Shane Johnson, "Copper Cable Theft: Revisiting the Price-Theft Hypothesis," *Journal of Research in Crime and Delinquency* 51, no. 5 (2014): 684–700.

of precious metals have the potential to affect many different facets of the overall economy, including consumer costs and the overall costs associated with constructing and operating critical infrastructure.²¹

In order to round out this section of the research, more consideration should be given unidentified, unintended consequences, of metal theft. As noted earlier, the purpose of highlighting unintended consequences is to engage policymakers at a more direct level than the abstract hypothesis of the overall direct effect of precious metal theft on homeland security.

4. Solutions for Combating Copper Cable Theft

There have been many publications issued by a variety of entities over the past 10 years highlighting various methods that have been used to detect and prevent precious metal theft from critical infrastructure. The bulk of the publications have been presented by private industries, such as security firms, intent on advancing their own products. Additionally, reports have been issued over the past three years from industrial groups as diverse as the American Public Power Association, Westar Energy, Southern Maryland Electric Cooperative, and the National Electrical Manufacturer's Association, among others. Within the United States, there has been no significant research published that adequately addresses how to combat copper cable theft. As previously mentioned, the Pol-Primett publication provided a blueprint for how the European Union has attacked the problem.

The most extensive research, and proposal, published to date regarding the United States approach was written by Jennifer Morrissey and David Shaffer in 2014. They published a proposal for a two-pronged approach to combat wire theft utilizing both public and private resources.²² The strength of their argument is that it mirrors one of the major approaches highlighted within the Pol-Primett document. Morrissey and Shaffer adequately argued that neither government nor private industry is capable of attacking

²¹ Ibid.

²² Jennifer Morrissey, and David Shaffer, "United States: Critical Infrastructure Security: The Need for a Twofold Approach," Mondaq, April 17, 2014, [http://www.mondaq.com/unitedstates/x/307928/OilGasElectricity/Critical InfrastructureSecurityTheNeedForATwofoldApproach](http://www.mondaq.com/unitedstates/x/307928/OilGasElectricity/Critical+InfrastructureSecurityTheNeedForATwofoldApproach).

precious metal theft working on their own.²³ Instead both entities must work together in concert to develop new strategies and funding mechanisms to adequately begin to solve the problem.²⁴ The majority of the research of Morrissey and Shaffer was drawn from documents produced by state and local partnerships, as well as recommendations from the Congressional Research Service.

Aside from the Morrissey and Shaffer document, there are two other research pieces that address solutions for combating precious metal theft. Working on a grant from the United States Department of Justice Office of Community Policing in 2010, Brandon Kooi compiled an extensive document aimed at informing state and municipal agencies nationwide of the growing number of cases of scrap metal theft throughout the country.²⁵ Though Kooi did not extend his research or recommendations beyond scrap metal, his hypothesis could easily be applied to the issue of copper metal theft. The other noteworthy item with Kooi's research is that he derived his statistical data directly from the uniformed crime reports compiled by the Federal Bureau of Investigation. The FBI data revealed the clearest picture available noting the marked rise in metal theft throughout the country.²⁶

Kevin Whiteacre's 2008 article, published in *Metals Theft Database Pilot Study*, only included information on scrap metal theft, similar to the Kooi piece. The value of Whiteacre's research lies in its study of 678 reported types of metal theft in a four state radius surrounding Indianapolis, Indiana during the first quarter of 2008.²⁷ His research is one the only studies available in the United States that specifically looked at actual crime data to support his overall hypothesis that metal theft is increasing nationwide.

²³ Ibid.

²⁴ Ibid.

²⁵ Brandon Kooi, "Theft of Scrap Metal," *Problem-Oriented Guides for Police Problem-Specific Series*, no. 58 (2010), http://www.popcenter.org/problems/pdfs/metal_theft.pdf.

²⁶ Ibid.

²⁷ Kevin Whiteacre, *Metals Theft Database Pilot Study* (Indianapolis, IN: University of Indianapolis Community Research Center, 2008), <https://www.ncjrs.gov/pdffiles1/225026.pdf>, 1–11.

C. SYNOPSIS

The material presented in this literature review is a synopsis of the bulk of material currently available that demonstrates the homeland security threat posed by precious metal theft. As indicated previously, more extensive research should be obtained from foreign entities to examine how they have fought the problem of metal theft over the past 10 years. Additionally, government entities and homeland security practitioners need to conduct research in cooperation with private entities in the United States to ascertain just how significant the threat to infrastructure is and the ultimate consequence of not adequately protecting critical resources from precious metal thieves.

D. CONCLUSIONS

The ultimate goal of this thesis is to present options to homeland security practitioners and policymakers in the United States for confronting the worldwide copper theft epidemic. As the world economy continues to expand and the price for copper continues to soar, the United States and its many components of critical infrastructure will continue to be adversely affected by copper wire theft.

In order to find an effective way forward for homeland security practitioners in the United States, this thesis includes a comprehensive case study analysis of three countries well versed in the fight against copper theft, the United Kingdom, France, and Italy. By effectively analyzing each country's successes and failures a clear path may be developed for the United States to combat the problem effectively.

Prior to examining each individual nation, it is first necessary to understand the overall extent of the copper theft epidemic throughout the world and in the United States. The next chapter explores the extent of the overall problem and the specific relation of copper wire theft to homeland security in the United States.

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II. THE COPPER THEFT EPIDEMIC

A. INTRODUCTION

Before attempting to find a reasonable path forward for the United States in the fight against copper wire theft, it is first imperative to explore the current level of the problem in the country and the significant impact it has had on homeland security. It is also important to understand why thieves target copper and the overall extent of the copper theft problem throughout the rest of the world. Understanding the extent of the problem in the United States and the reasons behind the ever-growing amount of thefts, as well as the extent of the problem throughout the world will afford the opportunity to explore best practices and find reasonable solutions to mitigate the problems currently confronted by law enforcement practitioners throughout the nation.

The exploration of the copper theft problem in this chapter includes the following elements: an explanation of why copper is targeted by thieves throughout the world, a review of the extent of the copper theft problem throughout the world, examples of damage to critical infrastructure in the United States and their linkage to the homeland security enterprise, as well as a review of the current level of theft in the United States, and the approaches that have been used in the past to combat the problem.

B. WHY COPPER?

Why is copper such a sought after commodity, and why is it so often used in facilities that are often classified throughout the world as critical infrastructure? Those questions must be answered in order to understand why the theft of copper has reached epidemic portions throughout the industrialized world.

Copper has been referred to in the press by various writers as “red gold.”²⁸ The demand for copper throughout the world has soared since the early part of the twenty-first century. In addition, copper is used in many facilities and components of critical

²⁸ Scott Berinato, “Red Gold Rush: The Copper Theft Epidemic,” CSO Online, February 1, 2007, accessed June 15, 2015, <http://www.csoonline.com/article/2121953/loss-prevention/red-gold-rush--the-copper-theft-epidemic.html>.

infrastructure because it is a superb conductor of electricity that is resistant to corrosion.²⁹ In the United States, copper products are generally used within four industrial categories: building construction, electrical, and electronic products; industrial machinery and equipment; transportation equipment; and consumer and general products.³⁰

Within those four broad categories, copper is used in a variety of ways in various different forms of infrastructure. In the energy sector, for instance, copper cabling is heavily used in all facets of the industry, including power generation, transmission, and distribution.³¹ In the railroad industry, copper cabling is used in a variety of manners, including providing electricity in high voltage electrical lines, serving as a conduit for the fiber optic networks that comprise the signaling and safety systems, and as relays for the complicated switching mechanisms used to move trains from one track to another.³²

Railroads and energy companies are not the only entities that heavily use copper wire in their facilities. The Federal Bureau of Investigation, in an assessment written in 2008, noted that copper is used in a variety of industries that are targeted by thieves including: “electrical sub-stations, cellular towers, telephone land lines, railroads, water wells, construction sites, and vacant homes.”³³ Copper’s heavy use in industrial applications has resulted in a situation where the demand for copper far outweighs the supply driving market prices for the commodity to historic highs. Furthermore, the rising cost of copper has also been the primary driver of the ever-increasing rate of thefts throughout the United States and the rest of the world.

²⁹ David Rout et al., *An Updated Assessment of Copper Wire Thefts from Electrical Utilities* (Washington, DC: U.S. Department of Energy, 2010), accessed June 4, 2015, <http://www.oe.netl.doe.gov/docs/UpdatedAssessment-Copper-Final-101210c.pdf>.

³⁰ Janice Jolly, and Maryland Dayton, *The U. S. Copper-base Scrap Industry and Its By-products: An Overview* (New York: Copper Development Association Inc., 2013), accessed August 15, 2015, http://www.copper.org/publications/pub_list/pdf/scrap_report.pdf, 14.

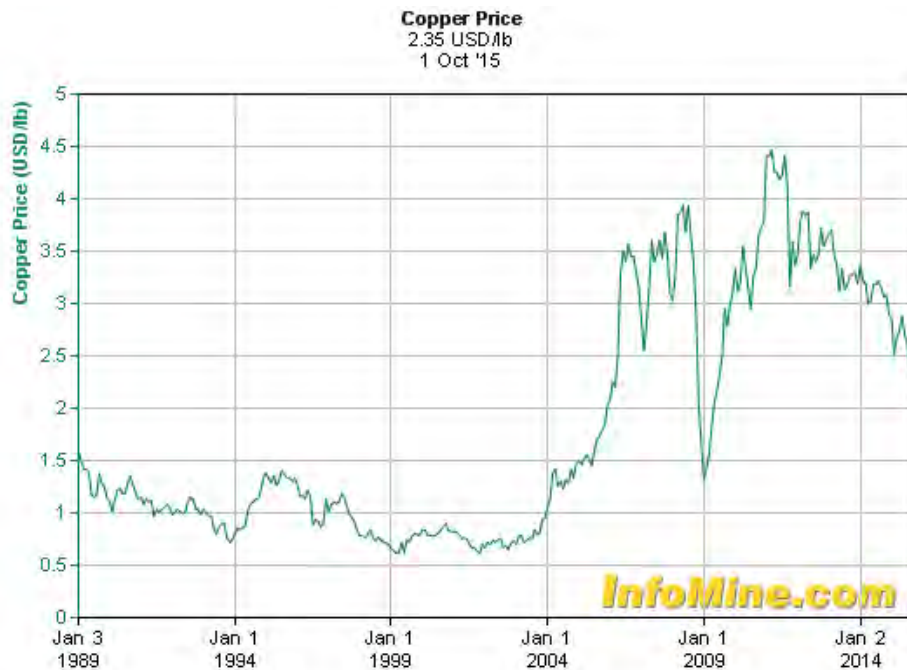
³¹ “Copper Theft from Canada’s Electricity Infrastructure,” Canadian Electricity Association, 2015, accessed September 2, 2015, <http://www.electricity.ca/media/CopperTheft/CopperTheftFactSheet.pdf>, 3.

³² Jan Falstad, “Copper Thieves Targeting Rail Lines,” *The Billings Gazette*, March 26, 2012, accessed September 1, 2015, http://billingsgazette.com/news/local/copper-thieves-targeting-rail-lines/article_be7a83ea-527b-51cb-9cf5-4fb97bec5e7b.html.

³³ Anthony Kimery, “FBI Intelligence Assessment Warns of Infrastructure Threat from Copper Thefts,” *Homeland Security Today*, December 4, 2008, accessed August 20, 2015, <http://www.hstoday.us/briefings/daily-news-analysis/single-article/fbi-intelligence-assessment-warns-of-infrastructure-threat-from-copper-thefts/60fa22ded5217a9cf594f413b073f910.html>.

As economies in countries, such as China, have expanded since the beginning of the twenty-first century the price for copper has steadily increased. The price for copper on the open market in 2003 was approximately \$0.65 cents per pound on the London Metals exchange.³⁴ By 2006, the price was approximately \$4.00 per pound, an astronomical increase by any measure.³⁵ On average, copper prices have continued to increase throughout the decade as the need for copper in developing nations has continued to expand. Figure 1 shows copper prices between 1989 and 2014, illustrating the significant spike in copper prices in 2010.

Figure 1. Copper Prices



Source: “Historical Copper Prices and Price Chart,” October 1, 2015, accessed October 5, 2015, <http://www.infomine.com/investment/metal-prices/copper/all/>.

To meet the increasing demand for copper throughout the world, various mining corporations have increased production and attempted to meet the market demand with

³⁴ Berinato, “Red Gold Rush: The Copper Theft Epidemic,” 4.

³⁵ Ibid.

copper mining initiatives. Unfortunately, the demand for copper far outpaces the amount of copper that can be safely mined each year. In fact, in spite of the increased demand for copper, the output of copper mines in the United States has not dramatically changed much over the past 15 years with the mining sector reporting a total of approximately 1.2 million tons of mined copper per year.³⁶ In order to meet the explosive demand for copper, the industry has turned to waste and scrap metal refining.³⁷

Copper, as opposed to other metals that are targeted by thieves, is easily recognizable due to its distinctive red coloring and can be located and separated with little trouble from the inside of complicated machinery and cabling structures by individuals that have no formal training in industrial applications.³⁸ The bulk of copper used in industrial applications is not tagged with unique identifying marks. In addition, as the product generally does not show any discoloration with age, it is incredibly difficult for legitimate scrap dealers to ascertain whether the copper sold to their business is a new product that was recently stolen, or an old product that was legitimately scrapped from older machinery.³⁹

As copper prices spiked throughout the world, thieves quickly realized that copper was a commodity worth stealing. In the United States, the number of theft incidents has risen dramatically each year. The National Insurance Crime Bureau (NICB) reported a staggering 81 percent rise in metal theft incidents between 2008 and 2011 alone.⁴⁰ The NICB's claim data showed approximately 13,000 claims filed between 2006 and 2008 as a result of copper wire theft incidents, compared to over 25,000 between 2009 and

³⁶ Edward Gresser, "Copper Theft Has Tripled in the U. S. over the Last Five Years," *Progressive Economy*, October 23, 2013, accessed August 19, 2015, http://www.progressive-economy.org/trade_facts/copper-theft-has-tripled-in-the-u-s-over-the-last-five-years/.

³⁷ *Ibid.*, 1.

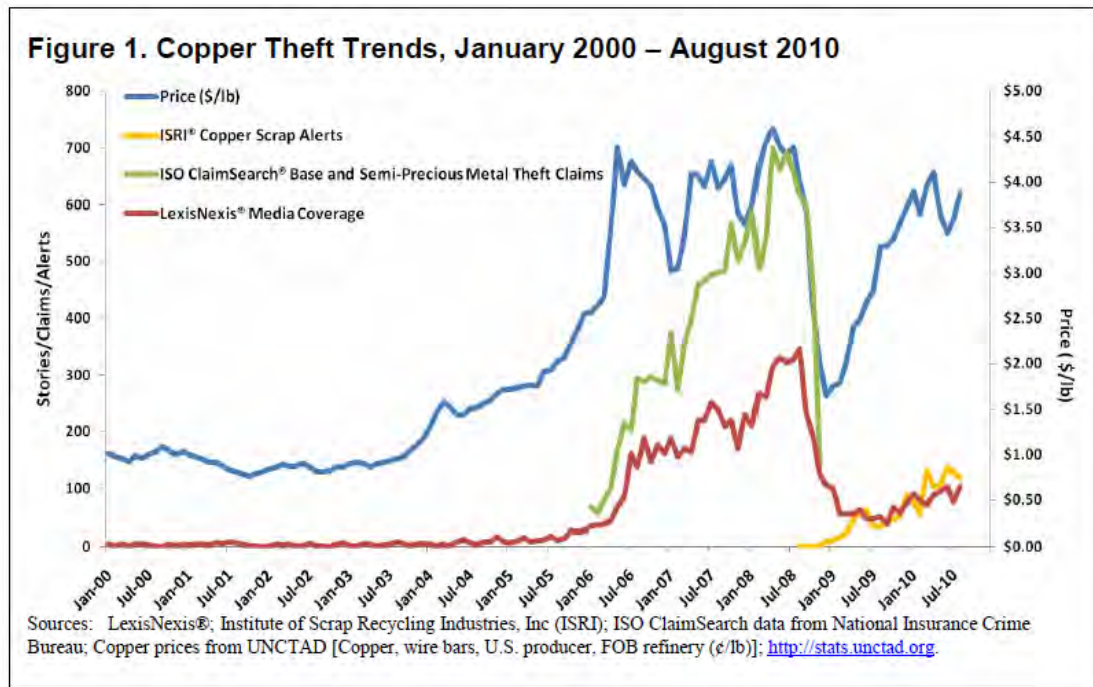
³⁸ Megan Sever, "Energy and Resources," *Geotimes*, October 1, 2006, accessed August 16, 2015, <http://www.geotimes.org/oct06/resources.html>.

³⁹ *Ibid.*

⁴⁰ "Metal Theft Report: Metal Theft Claims and Questionable Claims from January 1, 2009 to December 31, 2011," National Insurance Crime Bureau, March 8, 2012, accessed August 5, 2015, <https://www.nicb.org/newsroom/news-releases/metal-theft-report>.

2011.⁴¹ A chart created by the U. S. Department of Energy in 2010, which includes data from the Institute for Scrap Recycling Industries as well as media reports and information the NICB, demonstrated the clear rise in copper theft incidents in relation to copper prices in the United States between January of 2000 and August of 2010 (see Figure 2).

Figure 2. Copper Theft Trends January 2000–August 2010



Source: Rout et al., *An Updated Assessment of Copper Wire Thefts from Electrical Utilities*, 2.

The Department of Energy graph (Figure 2) accurately demonstrates that as copper prices rise, reported incidents of copper theft generally show a corresponding rise. Copper theft is not limited to small-scale operations either. In fact, the Federal Bureau of Investigation has repeatedly warned businesses and governmental entities that organized crime outfits commit large-scale thefts targeting cellular phone towers, railroads,

⁴¹ “Copper Theft on the Rise across U. S.,” *Times Free Press*, July 2, 2015, accessed August 12, 2015, <http://www.timesfreepress.com/news/breakingnews/story/2015/jun/02/copper-theft-rise-across-us/307532/>.

electrical sub-stations, and other vital components of critical infrastructure.⁴² As long as the price of copper remains high, it will continue to present an appealing target for both minor criminals and large organized crime groups.

While the data presented in this section predominantly references incidents and data from the United States, the copper theft issue is a problem that has plagued a variety of nations throughout the entire world.

C. A WORLD PROBLEM

The list of nations that have been adversely affected by copper theft is staggering. Government and media reports from diverse nations throughout the world highlight the deepening problem of copper theft, particularly as the price of the commodity has been driven to record levels as economies have expanded. Copper theft reports have flooded the media from locations as geographically diverse as Zambia, England, the United States, and the Philippines.⁴³ Media reports indicate that countries in the European Union appear to have been the hardest hit by copper thieves over the past 10 years.

For example, the Home Office of the United Kingdom reported that the nation suffered \$1.16 billion (U. S. currency [USC]) in losses associated with metal theft in calendar year 2010.⁴⁴ Thefts in the United Kingdom have occurred in virtually every sector of critical infrastructure. This has caused issues such as 16,000 hours of passenger delays over three years to the railroads and nearly 6,000 theft incidents from electrical companies throughout the nation in 2011, which caused blackouts in over 25,500 homes.⁴⁵ The United Kingdom is not alone in its susceptibility to metal theft.

⁴² “Copper Theft Threatens Critical Infrastructure,” *Brief of the Day*, December 12, 2008, Institute for Preventive Strategies at the Center for Rural Development, accessed September 2, 2015, http://www.preventivestrategies.net/public/osdb/pdfs/5972/12_9_08_OSDB.pdf.

⁴³ Sever, “Energy and Resources.”

⁴⁴ David Thomas, “Clamping Down on Metal Theft,” *Security*, February 1, 2013, accessed August 15, 2015, <http://www.safecommunitiesalgarve.com/wp-content/uploads/2013/08/Clamping-down-on-metal-theft.pdf>, 39.

⁴⁵ Tom Parry, “Out-dated Scrap Metal Laws Blamed for £1 Billion a Year Theft Epidemic,” *Daily Mirror*, November 6, 2011, accessed August 8, 2015, <http://www.mirror.co.uk/news/uk-news/out-dated-scrap-metal-laws-blamed-90122>.

Countries of all shapes, sizes, and economic backgrounds have been targeted by copper thieves in recent years. In Jamaica, for instance, the country's three major public utilities, the Jamaica Public Service (Electric), the National Water Commission (NWC), and LIME (telecommunications) have reported cumulative losses \$12.6 million (USC) associated with metal thefts between 2009 and 2012.⁴⁶ Estimates from law enforcement authorities in Portugal pegged the annual losses from utilities and businesses in the country in 2011 to be approximately \$48 million (USC).⁴⁷ In South Africa, it is estimated that copper cable thefts cost the nation's electrical providers nearly \$500 million (USC) per year due to the extensive costs associated with outages and repairing facilities destroyed by thieves.⁴⁸

Various types of infrastructure are appealing to copper thieves. For instance, railroads throughout Europe are heavily targeted by copper thieves, and nearly every major country has reported extensive issues associated with copper theft incidents. The state railway company of Germany, Deutsche Bahn, reported that thefts from the railroad rose approximately 50 percent between 2010 and 2011.⁴⁹ In Greece, the national railroad company reported losses of \$13 million (USC) associated with copper theft over a period of two years, while the Czech Republic reported losses of \$25 million (USC) in 2010 alone.⁵⁰ Aside from the heavy monetary costs of copper wire theft to railroads, the damage to infrastructure often causes a variety of consequences. In Belgium, for instance, the national railroad infrastructure corporation, Infrabel, repeatedly cites copper theft

⁴⁶ "10 Steps to a Scrap Metal Solution," Caribbean Policy Research Institute, 2012, accessed June 19, 2015, http://www.capricaribbean.com/sites/default/files/public/documents/briefing_paper/10_steps_to_a_scrap_metal_solution_full_brief.pdf.

⁴⁷ Parry, "Out-dated Scrap Metal Laws Blamed," 39.

⁴⁸ D. Y. Dzansi, P. Rambe, and L. Mathe, "Cable Theft and Vandalism by Employees of South Africa's Electricity Utility Companies: A Theoretical Explanation and Research Agenda," *Journal of Social Sciences* 39, no. 2 (2014): 180, <http://www.krepublishers.com/02-Journals/JSS/JSS-39-0-000-14-Web/JSS-39-2-14-Abst-PDF/JSS-39-2-179-14-1588-Dzansi-D-Y-T/JSS-39-2-179-14-1588-Dzansi-D-Y-T-Tx%5B6%5D.pdf>.

⁴⁹ International Union of Railways, *Metal Theft on the Railways* (Paris: International Union of Railways, 2013), http://uic.org/IMG/pdf/security_leaflet-metaltheft2013-pages.pdf.

⁵⁰ *Ibid.*, 6.

incidents for the extensive delays and service disruptions to trains that operate throughout its nation.⁵¹

Clearly, there has been demonstrable damage to the economies and critical infrastructure facilities of countries throughout the world. How though have thieves targeted the United States, and how do those theft incidents have a measurable impact on homeland security?

D. ATTACKS IN THE UNITED STATES

As noted in the previous section, copper wire theft is clearly an issue throughout the world posing significant economic implications for a variety of nations in differing geographic locations throughout the world. Does the theft problem have an impact on the homeland security enterprise in the United States? The answer lies within an explanation of what defines critical infrastructure in the United States, coupled with a review of reported theft incidents that have occurred throughout the nation.

The Department of Homeland Security defines critical infrastructure as those sectors that:

Compose the assets, systems, and networks, whether physical or virtual, so vital to the United States that their incapacitation or destruction would have a debilitating effect on security, national economic security, national public health or safety, or any combination thereof.⁵²

Presidential Policy Directive 21 further articulates that critical infrastructure in the United States exists within 16 clearly defined sectors: chemical, commercial facilities, communications, critical manufacturing, dams, defense industrial base, emergency services, energy, financial services, food and agriculture, government facilities, healthcare and public health, information technology, nuclear reactors and materials, transportation systems, and water and wastewater systems.⁵³ Quite simply, critical

⁵¹ “Cable Theft Surge Prompts Railways to Seek EU Action,” *EurActiv*, October 29, 2012, accessed August 15, 2015, <http://www.euractiv.com/transport/growing-cable-thefts-prompt-rail-news-515740>.

⁵² “10 Steps to a Scrap Metal Solution,” Caribbean Policy Research Institute.

⁵³ “Critical Infrastructure Sectors,” U.S. Department of Homeland Security, accessed September 2, 2015, <http://www.dhs.gov/critical-infrastructure-sectors>.

infrastructure in the United States could easily be defined as “something that people depend on, either directly or indirectly, for their lives and well being, in any time frame.”⁵⁴

Within those 16 defined sectors there are a variety of examples over the past 10 years of attacks perpetrated by copper thieves. In the water and wastewater system sector, for example, a variety of incidents have been covered in the media over the past decade. In 2007, for instance, copper thieves stole \$50.00 worth of copper tubing from water wells in San Bernadino County, California, resulting in residents being forced to conserve water for over 10 days.⁵⁵ In 2014, copper thieves disabled the drinking water supply in the Kalihi Valley in Hawaii when they stole approximately 2,000 feet of tubing from telemetry cables that were designed to alert officials about problems with the water supply.⁵⁶

Aside from water sector issues, copper wire thieves also have been known to cause serious problems for emergency services. In Camden, New Jersey in 2011, thieves stole the brass, which contains copper, fittings from fire hydrants throughout one neighborhood resulting in the hydrants becoming useless. During a 12-alarm fire in the town, the fire department could not effectively use water from the hydrants resulting in the destruction of a swath of property that left 12 families homeless.⁵⁷

Citizens in other communities in the United States have also had their lives and homes directly threatened as a result of copper theft. For instance, in Luther, Oklahoma, thieves were arrested in August of 2015 after they had rendered the town’s tornado sirens

⁵⁴ Fred Cohen, “What Makes Critical Infrastructures Critical?” *International Journal of Critical Infrastructure Protection* 3, no. 2 (2010): 53.

⁵⁵ Sara Lin, “Copper Thieves Target Wells,” *Los Angeles Times*, September 14, 2007, accessed August 26, 2015, <http://articles.latimes.com/2007/sep/14/local/me-copper14>.

⁵⁶ Marisa Yamane, “Copper Wire Thieves Are to Blame for Water Outage,” *KHON2*, April 10, 2014, accessed September 14, 2015, <http://khon2.com/2014/04/11/copper-wire-thieves-are-to-blame-for-water-outage/>.

⁵⁷ Edward Collimer, “Weak Economy Drives Theft of Copper Wiring,” *Philadelphia Inquirer*, June 15, 2011, accessed September 3, 2015, http://articles.philly.com/2011-06-15/news/29660661_1_copper-wiring-area-scrap-yards-metal-savengers.

useless when they stole copper wiring from the systems.⁵⁸ Unfortunately, the attack on the warning system was not the first instance of such an attack in the United States. In April of 2008 residents in Jackson, Mississippi found out during an actual storm that five of their tornado warning sirens had been rendered inoperable by thieves who had previously stolen copper wiring from the siren's housings.⁵⁹

The transportation sector is another sector in the in the United States that has also been hard hit by copper thieves in recent years. One of the most dangerous of the reported theft incidents occurred at the Seattle-Tacoma (SEA-TAC) International Airport in February of 2013 when two thieves stole over 3,000 feet of copper wiring from runway light towers.⁶⁰ Had the theft not been discovered by employees before an aircraft actually landed, the safety of aircraft landing at the airport would have been severely impacted, especially if there had been inclement weather. A similar type of theft occurred a year earlier in Modesto, California when two men were found to have stolen thousands of feet of wiring from airport lighting towers at the Modesto Airport, rendering an entire runway out of service.⁶¹

Railroads and mass transit systems in the United States have also been routinely targeted by copper thieves. In May of 2015, two entire subway lines were disabled by thieves in New York City who stole nearly 500 feet of copper cable from lines that carry power directly to trains.⁶² The disruption in service caused by the theft was significant as service suspensions caused tens of thousands of riders to either be late for or miss work altogether.⁶³ Similar types of thefts from mass transit agencies have been reported all

⁵⁸ Heide Brandes, "Oklahoma Ex-councilman Arrested for Witness Intimidation in Theft Case," Reuters, August 11, 2015, accessed September 2, 2015, <http://www.reuters.com/article/2015/08/11/us-usa-oklahoma-witness-idUSKCN0QG26H20150811>.

⁵⁹ "FBI Cracks Down on Copper Theft," *EC Mag*, January 2009, accessed September 1, 2015, <http://www.ecmag.com/section/safety/fbi-cracks-down-copper-theft>.

⁶⁰ "Two Charged for Copper Wire Theft at Sea-Tac Airport," Federal Bureau of Investigation.

⁶¹ "Two Modesto Men Face 20 Years in Copper Theft at Airport," *The Modesto Bee*, May 14, 2012, accessed August 24, 2015, <http://www.modbee.com/news/local/crime/article3143737.html>.

⁶² Emma Fitzsimmons, and Michael Wilson, "Theft of Copper Cables Disrupts Service on A and C Subway," *The New York Times*, May 27, 2015, accessed September 2, 2015, <http://www.nytimes.com/2015/05/28/nyregion/theft-of-copper-cables-disrupts-service-on-a-and-c-subway-lines.html>.

⁶³ *Ibid.*, 2.

over the United States, including the theft of thousands of pounds of copper cabling in 2011 from the Bay Area Rapid Transit (BART) system in San Francisco, California and from the Sound Transit system in Seattle, Washington.⁶⁴

Amtrak, the nation's intercity passenger service, has been directly affected on many occasions over the past 10 years by copper thieves. In one incident in early January of 2012, thieves removed safety signaling wire from a railroad interchange in New Jersey, which effectively disabled the railroad for hours and causing mass cancellations to Amtrak service as well as numerous New Jersey Transit trains that operate over Amtrak tracks.⁶⁵ In 2013, copper thieves in Lancaster County, Pennsylvania were charged by Amtrak Police officers with the theft of nearly 40,000 pounds of copper wiring stolen from communications systems, resulting in an extended loss of rail service and a financial loss of nearly \$500,000 dollars (USC).⁶⁶

While the transportation, emergency services, and water sectors have all been targeted by copper thieves in recent years, perhaps the most affected sector of critical infrastructure in the United States has been the energy sector. The Department of Energy published a report in 2007 that noted that calculating the actual number of thefts from electric utilities was impossible because theft reports were anecdotal in nature and often based solely from media reports. Using reports from a variety of energy corporations, in 2007, the Department of Energy estimated that total value of damages associated with copper wire theft was \$900 million (USC).⁶⁷ When the Department of Energy updated its findings with a report in 2010, it included a map, using data derived from media reports,

⁶⁴ Verena Dobnik, and Jake Pearson, "Copper Thefts from the Rails Rise with Price of the Metal," *MSN News*, June 2, 2015, accessed August 4, 2015, <http://www.msn.com/en-ca/news/other/copper-thefts-from-the-rails-rise-with-price-of-the-metal/ar-BBky7vr>.

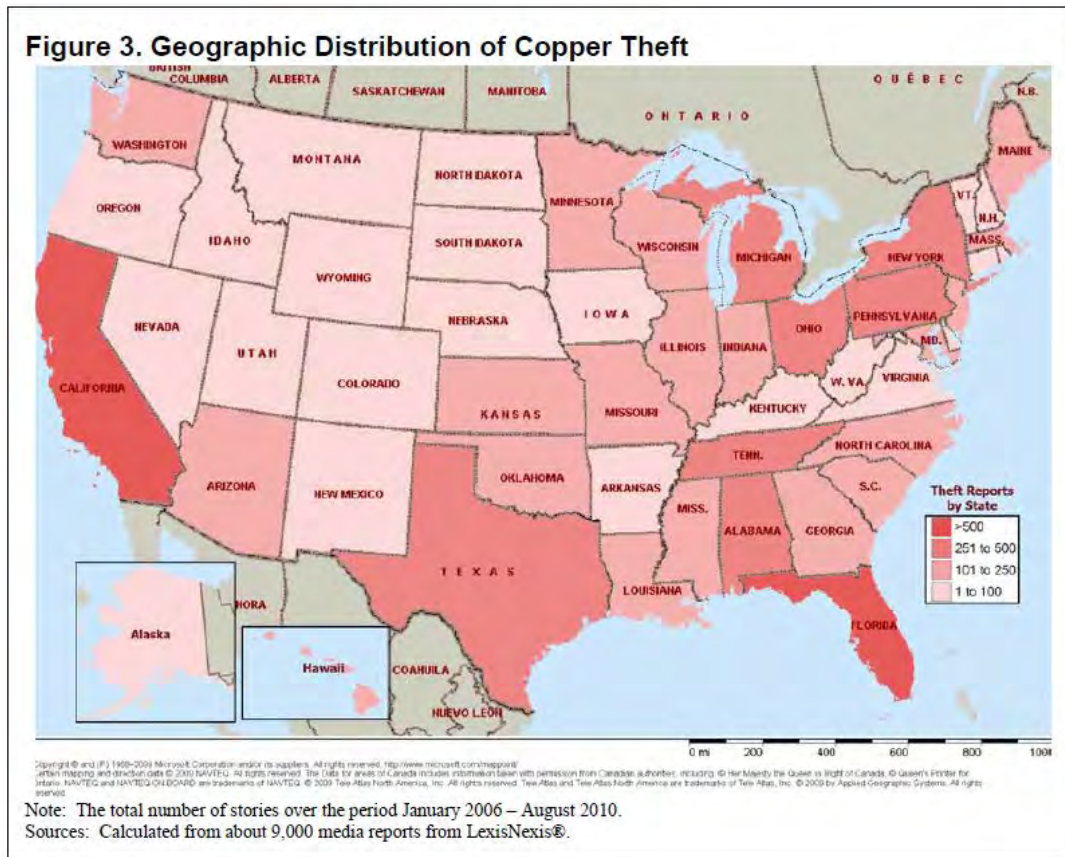
⁶⁵ Paul Nussbaum, "Copper Thieves Stealing Wires Hampering Service of Local Rail Lines," February 16, 2012, accessed August 17, 2015, http://articles.philly.com/2012-02-16/news/31067544_1_wire-thieves-metal-thieves-metal-thefts.

⁶⁶ Brett Hambright, "4 Charged with Stealing Lead, Copper Wire from Amtrak Lines," *Lancaster Online*, April 15, 2013, accessed August 27, 2015, http://lancasteronline.com/news/charged-with-stealing-lead-copper-wire-from-amtrak-lines/article_e54a5a03-27de-5a89-9bb1-e303c54caad6.html.

⁶⁷ John Ostrich, Mindi Farber-DeAnda, and Tiffany Choi, *An Assessment of Copper Wire Thefts from Electric Utilities* (Washington, DC: United States Department of Energy, 2007), <https://www.oe.netl.doe.gov/docs/copper042707.pdf>, 5.

to show how copper theft from energy providers was occurred in every state within the United States (see Figure 3).

Figure 3. Copper Theft in the United States



Source: Rout, *An Updated Assessment of Copper Wire Thefts from Electrical Utilities*, 7.

Data compiled from the Electrical Safety Foundation International found that there were nearly 7,600 hours of power outages directly attributed to copper theft in 2009.⁶⁸ Aside from the considerable costs associated with power outages, and the cost to repair those facilities that are directly impacted, copper thieves can cause a number of other outcomes equally damaging to energy companies, including causing fire and explosions that cause residual damage within the communities serviced by the provider.

⁶⁸ William Atkinson, “Preventing Copper Thievery,” *Public Power*, November 1, 2012, accessed September 2, 2015, <http://www.publicpower.org/Media/magazine/ArticleDetail.cfm?ItemNumber=36171>.

Explosions and electrocutions can also cause death to those attempting to steal wiring. In 2008, industry experts estimated that 56 serious injuries and 35 deaths were the result of theft attempts at electrical facilities located throughout the country.⁶⁹

E. THE EXTENT OF THE PROBLEM IN THE UNITED STATES

Unfortunately, as noted by the Department of Energy report, it is nearly impossible to ascertain the total damages caused by copper thieves to critical infrastructure facilities in the United States due of the lack of coordinated crime reporting.⁷⁰ The best estimate of the overall copper theft problem lies with the National Insurance Crime Bureau (NICB), which deals directly with claims filed by those directly impacted by copper thieves. The NICB estimated that in 2013, 97 percent of all insurance claims related to the theft of scrap metal were specifically related to copper.⁷¹ Additionally, a total of 39,976 copper theft incidents were reported to the NICB between 2011 and 2013.⁷² Furthermore, the Department of Energy estimates that those reported incidents, combined with a significant number of unreported incidents, ultimately results in net damages of approximately \$1 billion (USC) per year.⁷³

F. CURRENT METHODS OF INTERDICTION AND REGULATION IN UNITED STATES

The statistics and reports referenced earlier in this chapter clearly demonstrate that copper theft is a nationwide problem in the United States. Unfortunately, the problem has not been addressed on a national level. While the Federal Bureau of Investigation has been involved in a variety of operations targeting organized crime connections with metal

⁶⁹ Ibid.

⁷⁰ Rout et al., *An Updated Assessment of Copper Wire Thefts from Electrical Utilities*.

⁷¹ Mills, “Metals Theft: Is This Billion Dollar Crime on Your Radar?,” 12.

⁷² “Insured Metal Theft Claims See Three-Year Decline,” National Insurance Crime Bureau, May 8, 2014, accessed August 13, 2015, <https://www.nicb.org/newsroom/news-releases/insured-metal-theft-claims-see-three-year-decline>.

⁷³ Mills, “Metals Theft: Is This Billion Dollar Crime on Your Radar?,” 12.

theft, the primary driver behind enforcement efforts has been local law enforcement agencies.⁷⁴

A prime example of local law enforcement efforts in the United States was the approach taken by the City of Dayton, Ohio Police Department in response to a growing amount of metal thefts within their community. At first, the Dayton Police Department began to merely catalogue the amount of complaints specifically related to copper thefts using its Community Oriented Policing and Enforcement (C.O.P.E.) team.⁷⁵ After determining that reported copper theft incidents were increasing steadily between 2004 and 2006, the C.O.P.E. team invited members of the city government as well as representatives of local scrap dealers to weekly meetings aimed at developing new ways to combat the problem.⁷⁶ The working group agreed on a local ordinance that required all individuals selling scrap metal within city limits to be licensed by the city.⁷⁷ Following the passage of the ordinance scrap dealers immediately became more likely to report suspicious activity, and the theft of scrap metal within the city limits of Dayton appeared to drop significantly. Figures published by the Dayton Police Department show a drop in metal theft reports from a height of approximately 800 in 2006 to approximately 400 in 2008 (see Table 1).

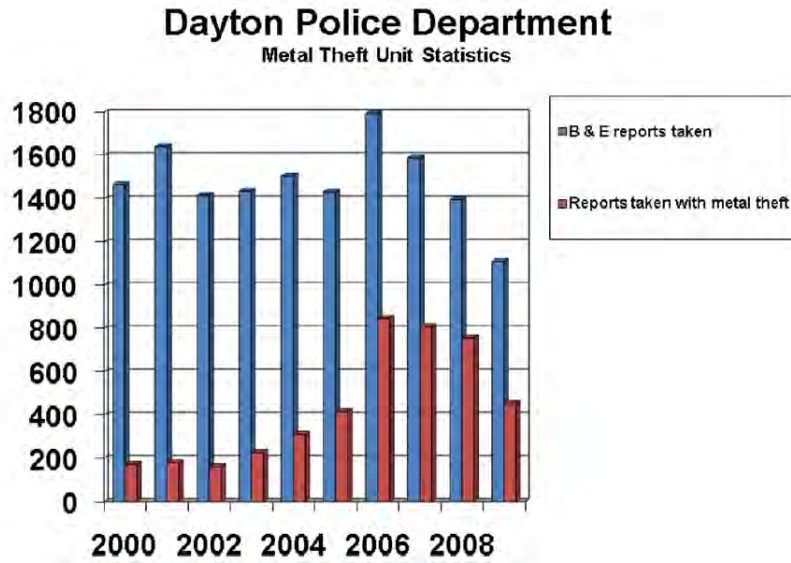
⁷⁴ Koba, “Copper Theft ‘Like an Epidemic’ Sweeping US.”

⁷⁵ Center for Problem Oriented Policing, *Metal Theft: A Major Problem in Dayton, Ohio: Identification and Reduction* (Dayton, OH: Center for Problem Oriented Policing, 2010), <http://www.popcenter.org/library/awards/goldstein/2010/10-45.pdf>.

⁷⁶ *Ibid.*, 6.

⁷⁷ *Ibid.*, 12.

Table 1. Metal Theft Statistics



Source: Center for Problem Oriented Policing, *Metal Theft: A Major Problem in Dayton, Ohio*, 19.

Other local municipalities have had success curbing the rise of metal theft incidents within their communities. For example, the City of Eau Claire, Wisconsin experienced a spike similar to Dayton, Ohio in 2006 and 2007. Detectives working for the Eau Claire Police Department initially found that scrap dealers operating within city limits were generally uncooperative and did not keep records of transactions with scrap sellers.⁷⁸ The Eau Claire Police, following a series of initial failures, eventually worked with surrounding jurisdictions and the Wisconsin State Legislature to write, and ultimately pass legislation requiring scrap dealers to record identifying information on individuals selling scrap within the state.⁷⁹ The Eau Claire Police reported a 70 percent drop in the value of metal stolen between 2006 and 2008—a drop they believe was heavily influenced by their local efforts.⁸⁰

⁷⁸ Eau Claire Police Department, *The Eau Claire, Wisconsin Metal Theft Initiative: Crime Facilitators: Where the Problem Meets the Solution* (Eau Claire, WI: Eau Claire Police Department, 2009), <http://www.popcenter.org/library/awards/goldstein/2009/09-01.pdf>.

⁷⁹ *Ibid.*, 1.

⁸⁰ *Ibid.*

Unfortunately, the Dayton, Ohio and Eau Claire, Wisconsin programs appear to be outside of the norm as far as response to copper theft within the United States goes. In addition, they were initiated before copper prices began to soar towards the end of the first decade of the twenty-first century. There is significant anecdotal evidence from a variety of sources, including from the NICB and the Electrical Safety Foundation International, that show reported incidents of copper increased significantly between 2008 and 2011—well after the reported successes in Dayton and Eau Claire.

A variety of measures have been passed by state governments in the United States over the past 10 years that are aimed at attacking the metal theft epidemic. Measures adopted by the states have included forcing dealers to maintain records of transactions, requiring identification from sellers including fingerprint data, installing a waiting period for sellers to receive payment, and enhanced penalties for metal theft offenses.⁸¹ In fact, data compiled from the Institute for Scrap Recycling Industries in 2015 showed that all 50 state legislatures had at some point between 2008 and 2015 passed legislation specifically aimed at combating the growth of metal theft in their respective jurisdictions.⁸²

Unfortunately, data collected from a variety of sources have proven that state level efforts have had no measurable impact on the overall national problem. NICB data showed that the bulk of the 41,138 metal theft claims filed between 2010 and 2013 came from five different states: Ohio, Texas, California, Pennsylvania, and Georgia. Each of the states noted in the NICB report have enacted enhanced statutes related to metal theft, employing a variety of different solutions to the problem. The statistics show that the metal theft problem is a nationwide problem and not merely a problem that can be cured with local solutions.

⁸¹ Jennifer Burnett, Elle Hull, and Nurlan Kussainov, *Scrap Metal Theft: Is Legislation Working for States?*, (Lexington, KY: Council of State Governments, 2014), http://knowledgecenter.csg.org/kc/system/files/MetalTheft_Final%20%2805282014%29.pdf.

⁸² “State Metal Theft Statutes,” Institute of Scrap Recycling Industries, 2015, <https://www.isri.org/docs/default-source/state-specific-policy-resources/state-metal-theft-statutes---compiled-as-of-april-9-2015.pdf?sfvrsn=16, 2>.

G. SUMMARY

As evidence in this thesis clearly shows, the copper theft epidemic has adversely affected the United States and many other nations throughout the world. There are a myriad of examples of how copper thieves have irreparably damaged critical infrastructure directly threatening the safety and well being of citizens all over the nation. If the copper theft epidemic were to continue unabated, it is likely that the United States will continue to lose approximately a billion dollars a year repairing and replacing infrastructure assets throughout the country.

How then does the United States design and implement a comprehensive approach to copper theft? A detailed examination of the approaches taken by three different European countries (the United Kingdom, France, and Italy) may possibly demonstrate a cohesive way forward for politicians, law enforcement, private industry, and government regulators. The following three chapters provide a detailed examination of each country and an summary of their experiences combating the copper theft problem.

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III. UNITED KINGDOM

A. INTRODUCTION

In order to determine a viable approach to combat the significant copper and scrap metal theft problem in the United States, it is first necessary to examine the successes and failures of metal theft initiatives in other nations. The first nation that this thesis explores in depth is the United Kingdom. The detailed examination of the United Kingdom will include background on the copper theft problem within the country and well as a definition of what constitutes critical infrastructure within the nation. In addition the chapter will identify relevant stakeholders in the country, combined with a review of the various regulatory and enforcement efforts that have been undertaken to date. Finally, the chapter will conclude with a brief analysis of the efforts undertaken within the nation.

B. BACKGROUND

The United Kingdom, like many other nations, has been plagued by a substantial amount of metal thefts in recent years that have caused significant financial and operational problems for various parts of critical infrastructure facilities located throughout the country. It is difficult to track the precise number of metal thefts that have occurred in the United Kingdom simply because there is no required statistical crime reporting data that differentiates metal theft from the wide variety of other larcenies that are committed. The British Transport Police (BTP) and the Energy Networks Association (ENA) have developed their own metrics, based on specific crime reports and data from insurance losses, to produce meaningful statistics related specifically to metal theft. Both the BTP and ENA found that metal theft incidents increased by nearly 300 percent between 2009 and 2011, while reports of nonmetal theft related larcenies dropped significantly.⁸³

⁸³ Nick Morgan, Jacqueline Hoare, and Christos Byron, "An Evaluation of Government/Law Enforcement Interventions Aimed at Reducing Metal Theft," *Home Office Research Report 80*, 2015, https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/398511/horr80.pdf.

There are numerous news and governmental reports that extensively highlight the problems caused by metal theft in the United Kingdom. In a raid in 2011, for example, copper thieves stole nearly six miles of cabling from Network Rail property, resulting in approximately \$1,080,000 (USC) in damage.⁸⁴ Network Rail is the governmental entity in the United Kingdom responsible for maintaining the nation's heavy rail infrastructure.

In addition to the substantial damage to the rail infrastructure, the residual effects of copper theft also have resulted in a number of additional consequences. In a separate copper theft from Network Rail of a much smaller nature, damages of approximately \$123,000.00 (USC) resulted in delays to approximately 108 trains, causing an average of approximately 17 lost passenger hours waiting on delayed travel.⁸⁵ In calendar year 2010, Network Rail reported a total of 6,088 hours of delay attributed directly to copper theft as well as nearly \$255,000,000 (USC) worth of necessary repairs.⁸⁶ Delays are not only limited to heavy rail operations, as evidenced by the cancellation of 71 subway trains during rush hour in Manchester, England after a cable theft on November 21, 2007.⁸⁷

C. DEFINITION OF CRITICAL INFRASTRUCTURE

The determination of what constitutes critical infrastructure within the United Kingdom is codified in legislative language. The government of the United Kingdom defines critical infrastructure as “those facilities, systems, sites and networks necessary for the functioning of the country and the delivery of the essential services upon which daily life in the UK depends.”⁸⁸ The Civil Contingencies Act of 2004 further defined critical infrastructure as within the scope of nine sectors: food, energy, water,

⁸⁴ Sara Malm, “Gang of Thieves Stole SIX MILES of Copper Wiring Worth £700,000 Bringing down Telephone Services and Hitting the Rail Network,” *Mail Online*, January 29, 2013, accessed August 1, 2015, <http://www.dailymail.co.uk/news/article-2270339/Gang-thieves-stole-SIX-MILES-copper-wiring-worth-700-000-bringing-telephone-services-hitting-rail-network.html>.

⁸⁵ Denise Winterman, “Metal Theft: Britain’s Most Annoying Crime Wave,” *BBC News Magazine*, September 28, 2011, accessed August 4, 2015, <http://www.bbc.com/news/magazine-15062064>.

⁸⁶ *Ibid.*, 4.

⁸⁷ Luke Bennett, “Assets under Attack: Metal Theft, the Built Environment and the Dark Side of the Global Recycling Market,” *Environmental Law and Management* 20 (2008): 176–83.

⁸⁸ “The National Infrastructure,” Center for the Protection of National Infrastructure, accessed August 13, 2015, <http://www.cpni.gov.uk/about/cni/>.

communications, transport, health, emergency services, government, and finance.⁸⁹ Crime statistics produced by the Home Office showed that 47 percent (approximately 28,000 incidents) of metal theft offenses in England and Wales between April of 2012 and March of 2013 were offenses that occurred at facilities designated as part of the nation's critical infrastructure.⁹⁰

Transport and energy are those sectors that are most directly vulnerable to metal thieves because of their heavy reliance on copper wiring and the placement of facilities throughout the country. The economic effect caused by metal theft on the energy sector is substantial. The Energy Networks Association (ENA) reported that metal theft cost the energy generation industry nearly £12 million in 2010 and close to £60 million in 2011.⁹¹ Aside from economic impact, the ENA also reported numerous electrical outages throughout the country during the same timeframe.

The economic damage caused by metal theft has the potential to have a significant impact on all of the critical infrastructure sectors defined by the British government. The damage to the overall economy as a result of metal theft was estimated in 2010 to be approximately £770 million per year.⁹² The severe economic consequences greatly hamper the ability of the government and private entities to adequately make repairs and enhancements to critical infrastructure facilities.

D. STAKEHOLDERS

A wide variety of stakeholders in the United Kingdom have an interest in the protection of critical infrastructure and the reduction in the number of metal thefts in the nation. First and foremost is the government of the United Kingdom. The government of

⁸⁹ "Section A: Introduction, Definitions and Principles of Infrastructure Resilience," Cabinet Office, accessed August 4, 2015, https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/78902/section-a-natural-hazards-infrastructure.pdf.

⁹⁰ "Statistical News Release: Metal Theft, England and Wales, Financial Year Ending March 2013." Home Office Press Office. November 28, 2013, accessed August 1, 2015, https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/261774/metal-theft-england-wales-2013snr.pdf.

⁹¹ Oliver Bennett, "Scrap Metal Dealers Bill," *House of Commons Research Paper* 12, no. 39 (2012): 2–5.

⁹² Sally Lipscombe, and Oliver Bennett, "Metal Theft, Home Affairs, Science, and Environment, 2012, researchbriefings.files.parliament.uk/documents/SN06150/SN06150.pdf.

the United Kingdom has a vested interest in keeping the various military facilities located throughout the British Isles in operating condition, and it has invested an extensive amount of money in protecting those facilities from metal thieves. The government of the United Kingdom also operates Network Rail, and it is responsible for ensuring upkeep on the nation's many rail lines.

While Network Rail is ultimately responsible for the rail infrastructure, there are numerous private railroad operators throughout the nation that are directly impacted by attacks on the nation's railroad infrastructure. Currently, there are 28 different train companies that operate on Network Rail property.⁹³ Each of those operators can suffer severe financial consequences when trains are delayed or unable to operate because of metal theft attacks on infrastructure, including safety components such as signaling facilities.

Additional governmental stakeholders include the various police forces around the nation. A total of 46 different police agencies operate in the United Kingdom.⁹⁴ Agencies range in size from small county constabularies to the more well-known London Metropolitan Police and national forces, including the British Transport Police. Each law enforcement agency within the country has been directly affected by copper and metal theft within their jurisdictions. As the primary agency responsible for protecting the nation's transport services, the British Transport Police have taken the lead in recent years as the head of multiple task forces created to stem the tide of rising incidents involving copper and metal theft.⁹⁵

In addition to the various government agencies, there are numerous private stakeholders that have a vested interest in reducing the substantial amount of copper and metal thefts that have plagued the nation since the beginning of the twenty-first century. In the energy sector, there are a total of six companies, known as the "Big Six," which provide gas and electric services to approximately 50 million customers throughout the

⁹³ "UK Rail Operators," accessed August 5, 2015, <http://www.rail.co.uk/our-partners/rail-operators/>.

⁹⁴ "Police Contacts," accessed August 10, 2015, <https://www.police.uk/contact/>.

⁹⁵ Andrew McCorkell, "Copper Thefts Rise to an All-time High," *The Independent*, February 27, 2011, <http://www.independent.co.uk/news/uk/crime/copper-thefts-rise-to-an-all-time-high-2226773.html>.

country.⁹⁶ The Big Six is comprised of the following corporations: British Gas, Npower, SSE, Scottish Power, E. on, and EDF.⁹⁷

In addition to the Big Six, there are various other smaller entities that deliver power and gas to customers. The smaller entities account for approximately 7.5 percent of the customers located in the United Kingdom.⁹⁸ All energy providers in the United Kingdom have been victimized by metal thieves over the years and have sought ways to reduce the overall amount of theft and subsequent disruptions in service caused by thieves.

The Energy Networks Association (ENA) represents the bulk of energy providers in the United Kingdom. The ENA is a conglomerate industry association representing the majority of gas and electricity providers in the country.⁹⁹ The ENA has been at the forefront of private industry associations lobbying for various legislative and law enforcement initiatives designed to protect their member corporations from the financial damage and disruption caused by copper thieves.

The final stakeholder that has an important role to play in the copper theft problem is the scrap metal recycling industry, represented publicly by the British Metals Recycling Association (BMRA). The BMRA represents businesses, large and small, that specialize in processing scrap metal for reuse in a wide variety of applications. The scrap metal recycling industry is noted in BMRA literature as being a £5.6 billion a year enterprise.¹⁰⁰ As efforts to reduce copper theft have accelerated in the United Kingdom, the BMRA has become more active in law enforcement operations and ensuring that their

⁹⁶ “The Big Six Energy Companies,” U. K. Power, June 1, 2012, <https://www.ukpower.co.uk/the-big-six-energy-companies>.

⁹⁷ “Who Are the ‘Big Six’ Energy Companies?” *BBC News*, March 27, 2014, <http://www.bbc.com/news/business-24670741>.

⁹⁸ Edmund Reiden, “Independent Suppliers Reach Record 7.5% Share of Domestic Market” [news release], Cornwall Energy, 2014. <http://www.cornwallenergy.com/News/Press-releases/Independent-suppliers-reach-record-7-5percent-share-of-domestic-market>.

⁹⁹ “ENA Group Members,” Energy Networks Association, 2015, <http://www.energynetworks.org/info/about/membership/ena-group-members.html>.

¹⁰⁰ “About the British Metals Recycling Association (BMRA),” British Metals Recycling Association, accessed August 3, 2015, http://www.recyclemetals.org/about_bmra.

member's voices are heard by politicians considering legislative changes to the rules governing the scrap metal business.

E. INTERDICTION THROUGH LEGISLATIVE ACTION, REGULATION, AND ENFORCEMENT

To combat the extensive metal threat problem in the United Kingdom, the government and various private industry stakeholders have relied on a variety of methods. Initially, the methods used to combat the rising metal theft problem in the first decade of the twenty-first century mirrored the traditional law enforcement and security methods that have been used since policing became a profession. Police respond to the scene of a metal theft, record the crime, and then proceed to the next call. The business owner or governmental agency then replaced the metal that was taken and the scene repeats itself over and over again. There is little evidence during that time that any of the major police agencies in the United Kingdom used proven law enforcement strategies such as gathering information, intelligence, and utilizing forensic recovery tools to investigate incidents involving metal theft properly.¹⁰¹

A primary example of the type of initiatives undertaken in the United Kingdom during that timeframe was Operation Fragment, which targeted metal theft in the eastern portion of Somerset County, England beginning in late 2008. In response to a growing amount of thefts from utility companies, the Avon and Somerset Constabulary assembled Operation Fragment using tried and tested methods of community policing. Officers from the constabulary relied on undercover officers to verify that scrap yards were adhering to regulations. The constabulary also used a variety of media tools to raise public awareness about metal theft, and the agency relied heavily on community engagement at vulnerable locations such as schools, churches, and public utilities.¹⁰² Rather than simply recording the metal thefts, the Avon and Somerset Constabulary attempted to deploy proven assets and strategies to attack the problem proactively.

¹⁰¹ Mark Edgington, *Tilley Awards 2009 Application Form* (London: Home Office Crime Reduction and Community Safety Group, 2009).

¹⁰² *Ibid.*, 19.

Operation Fragment was typical of early operations aimed at copper wire thieves. To attack the problem, law enforcement did what it is historically known for, targeting the actual perpetrators of criminal acts and ensuring their prosecution for the wire thefts. Arrest statistics were staggering during the time period of 2006 to 2013. In 2011 alone, the British Transport Police reported its officers arrested over 1,000 metal theft suspects.¹⁰³ In spite of enhanced law enforcement tactics and a significant amount of arrests, incidents involving copper wire theft have continued to rise.

As the metal theft problem continued to accelerate at an alarming speed towards the end of the first decade of the twenty-first century, the government has undertaken new methods to attempt to confront and reduce the growing problem. For instance, in early 2012, law enforcement and the British Metals Recycling Association launched a collaborative effort, a new program called Operation Tornado.¹⁰⁴ Operation Tornado was launched first in County Durham, an area heavily affected by copper theft. The goal of the operation was to reduce incidents of copper wire theft by putting a heavy investigative and regulatory focus on the scrap dealers operating in the county.

As part of Operation Tornado, licensed scrap metal dealers operating in the county agreed to buy scrap metal only after receiving valid photo identification from the seller and then maintaining a copy of the identification for a period of six months.¹⁰⁵ Sales of scrap metal in exchange for cash payments without proof of identification were long believed by law enforcement to be a significant reason why copper theft was such a lucrative enterprise.

In addition to the enhanced regulation, law enforcement entities, including the Durham, Cleveland, and Northumbria Police Forces, continued a multijurisdictional

¹⁰³ Robin Edwards, "Tornado Routs Britain's Metal Thieves," *Royal Canadian Mounted Police Gazette*, July 13, 2013.

¹⁰⁴ *Ibid.*

¹⁰⁵ Lorraine O'Donnell, *Over and Scrutiny Review: 'Use of Legislation Available to the Council to Tackle Metal Theft within County Durham,'* (Durham, UK: Safer and Stronger Communities Overview and Scrutiny Committee, 2012) http://www.durham.gov.uk/media/1638/Metal-theft-Report/pdf/OS_Metaltheft.pdf.

effort to identify and arrest known copper wire thieves.¹⁰⁶ Additionally, periodic and unannounced inspection visits were undertaken by regulators at scrap dealers to ensure compliance with the identification regulation. The identification regulation was developed initially as a voluntary trial mechanism, and law enforcement leaders did not believe that many scrap dealers would voluntarily participate in the program. To their surprise, at the conclusion of 2012, law enforcement reported that 100 percent of the licensed scrap dealers within County Durham were compliant with the enhanced regulation.¹⁰⁷

Initial statistics related to Operation Tornado compiled by law enforcement seemed to show that the licensing component of the program had a significant impact on crime rates. The British Transport Police (BTP) reported that County Durham reported a 55 percent reduction in offenses, as well a separate 60 percent reduction in incidents of copper wire theft from railroad property patrolled by the BTP.¹⁰⁸

The success of Operation Tornado caused the government of the United Kingdom to take notice and a strong effort was made to find ways to replicate the success of the operation nationwide. The National Metal Theft Task Force, led by the British Transport Police, was launched in conjunction with Operation Tornado in January of 2012.¹⁰⁹ The task force was initially comprised of the BTP, local and regional police forces, representatives from various industry associations, insurance companies, and the British Metals Recycling Association.¹¹⁰ The task force received an initial budget of approximately £5 million, with additional funding boosts of £500,000 in calendar years 2013 and 2014.¹¹¹ Growing out of the successes of the task force and Operation Tornado,

¹⁰⁶ Ibid.

¹⁰⁷ Ibid.

¹⁰⁸ "Operation Tornado," British Transport Police, accessed August 23, 2015, http://www.btp.police.uk/advice_and_information/how_we_tackle_crime/operation_tornado.

¹⁰⁹ "Fight on Metal Theft Boosted by Government Funding," The Home Office and the Rt. Hon. Norman Baker, July 1, 2014, <https://www.gov.uk/government/news/fight-on-metal-theft-boosted-by-government-funding>.

¹¹⁰ Chiara Francavilla, "Forces to Keep Metal Theft Teams after Taskforce Ends," *MWR*, September 4, 2014, accessed August 13, 2015, <http://www.mrw.co.uk/news/forces-to-keep-metal-theft-teams-after-taskforce-ends/8669276.article>.

¹¹¹ Ibid.

a legislative solution to the metal theft problem was passed by the government in early 2013.

The Scrap Metal Dealers Act of 2013 became law on February 28, 2013.¹¹² Many provisions of the new law were created as a direct result of the success of the National Metal Task Force and Operation Tornado. Provisions directly related to Operation Tornado included the following:

1 (1) No person may carry on business as a scrap metal dealer unless authorized by a licence under this Act (a “scrap metal license”)

2 (1) A scrap metal licence is to be issued by a local authority
11 (1) A scrap metal dealer must not receive scrap metal from a person without verifying the person’s full name and address.

11 (2) That verification must be by reference to documents, data or other information obtained from a reliable and independent source.

12 (1) A scrap metal dealer must not pay for scrap metal except—

- (a) by a cheque with under section 81A of the Bills of Exchange Act 1882 is not transferable, or
- (b) by an electronic transfer of funds (authorized by credit or debit card or otherwise).¹¹³

The last provision of the bill is perhaps the most impactful portion of the legislation.

As a result of the last provision, scrap dealers would no longer be allowed to pay for scrap metal with cash payments. Instead, all transactions now must occur by either check or electronic transfer, ensuring a permanent record of the transaction. Stolen scrap metal sold to a licensed dealer could therefore be easily traced by law enforcement officials viewing the recorded identify of the seller, as well as tracing the financial transaction.

¹¹² *Scrap Metal Dealers Act 2013: Determining Suitability to Hold a Scrap Metal Dealer’s License* (2014).

¹¹³ “Scrap Metal Dealers Act 2013,” accessed June 15, 2015, http://www.legislation.gov.uk/ukpga/2013/10/pdfs/ukpga_20130010_en.pdf.

F. WERE ENFORCEMENT AND LEGISLATIVE EFFORTS SUCCESSFUL?

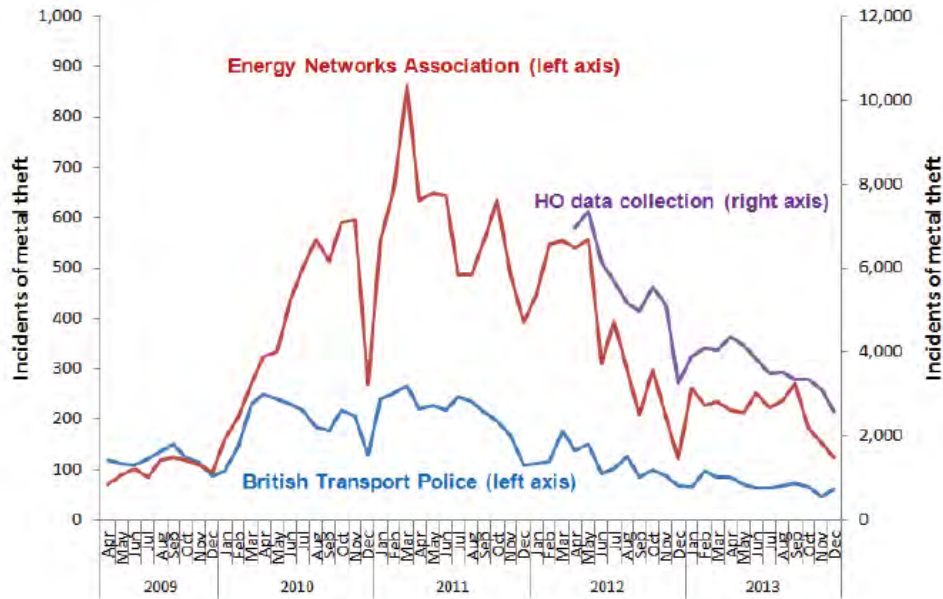
The United Kingdom, like many other nations, had tried unsuccessfully for years to combat rising incidents involving metal theft with standard law enforcement tactics. Between 2006 and 2011, while traditional law enforcement methods were embraced, metal theft reports continued to rise. Between 2009 and 2011 in England and Wales reported metal theft incidents increased nearly 300 percent.¹¹⁴ Clearly law enforcement efforts, including Operation Fragment, had no impact on reducing metal theft, in spite of a substantial amount of arrests (314 prosecutions in 2011).¹¹⁵

The tide began to turn beginning with Operation Tornado in 2012. Official data compiled by the Home Office and derived from reports from the Energy Networks Association, internal Home Office data, and the British Transport Police shows a marked reduction in incidents of reported metal theft. Table 2 illustrates the reduction of reported incidents nationwide from a peak in mid-2011 to the end of calendar year 2013.

¹¹⁴ Morgan, Hoare, and Byron, “An Evaluation of Government/Law Enforcement Interventions,”

¹¹⁵ “Tackling Metal Theft: Briefing from the LGA for Prospective Police and Crime Commissioners,” Local Government Association, September 1, 2012, accessed August 12, 2015, http://www.local.gov.uk/c/document_library/get_file?uuid=d716e486-3b67-408d-9305-92aeea7a4965&groupId=10180.

Table 2. Recorded Incidents of Metal Theft (UK)



Source: Tackling Metal Theft: Briefing from the LGA for Prospective Police and Crime Commissioners,” Local Government Association

Further data, derived solely from England and Wales show a corresponding marked reduction in metal theft incidents between 2012/13 and 2013/14, as seen in Table 3.

Table 3. Metal Theft Offences (UK)

Table 2.1: Metal theft offences recorded by the police, 2012/13 and 2013/14 (1,2)

England and Wales			
	2012/13	2013/14	% change
Number of offences:			
Infrastructure related ³	28,257	16,772	-41
Non-infrastructure related ³	25,816	18,767	-27
All metal theft⁴	57,983	38,081	-34

Source: “Tackling Metal Theft: Briefing from the LGA for Prospective Police and Crime Commissioners,” Local Government Association, 9.

Data compiled by the Home Office clearly demonstrates that the combined legislative and law enforcement tactics adopted in 2012 and early 2013 have had a significant impact on metal theft incidents within United Kingdom.

G. CONCLUSION / ANALYSIS

While the data from the United Kingdom is encouraging at first glance, it is critically important to further analyze the reported trends and to examine whether or not the programs utilized in the United Kingdom would have any relevant applicability within the United States. In the analysis section of this thesis, the programs and initiatives utilized in the nation are evaluated based on the metrics developed in the methodology section. Using the developed metrics allows the successes or failures of the United Kingdom to be compared to the other two sample nations. Prior to the comparative analysis, however, the individual efforts of the United Kingdom must be evaluated based on the metrics developed for this thesis.

On the first metric, which evaluates the nation's efforts with respect to the regulation of the scrap industry, the United Kingdom scores a ranking of five. The passage of the Scrap Metal Dealer's Act in 2013 resulted in heavy regulation of the legal scrap trade and a measurable reduction in thefts occurred throughout the nation following its implementation.

With respect to the second metric, an evaluation of legal changes to criminal statutes, the United Kingdom scores a ranking of one due to a lack of legislative proposals related to enhanced penalties. The government of the United Kingdom focused the bulk of its efforts on regulation of the scrap industry and did not make any effort to enhance criminal penalties for those convicted of stealing copper wire. Instead, legislative changes related to criminal penalties were developed for licensed dealers that violated codified regulations.

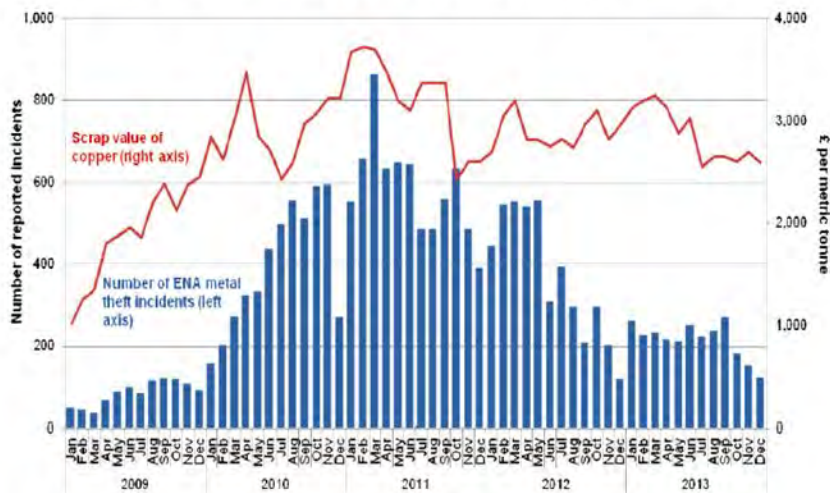
The United Kingdom scores a rating of five on the third metric, which evaluates the level of changes to the criminal justice strategy within the nation. The nation made multiple changes to its strategy as copper theft incidents continued to rise. Realizing that a local approach was ineffective, the government turned to the British Transport Police to

centralize all copper theft operations. The centralization of operations was the key to developing new and innovative approaches to attack the problem. In addition, centralization also afforded the country the opportunity to have a unified voice in international operations. The United Kingdom was one of the initial participants in the European Union’s Pol-Primett program, and the British Transport Police became heavily engaged multinational operations designed to combat cross-border, organized crime activities.

On the final metric, the demonstration of a measurable reduction in copper theft incidents, the United Kingdom also scores a rating of five. Any critical analysis of the United Kingdom’s apparent success must include a comparison of theft incidents with the open market copper price index to account for any price fluctuations that could have influenced the statistics. The British Home Office produced a research report examining the linkage between copper prices and copper theft. The results, shown Figure 4, are very encouraging.

Figure 4. Copper Price Index/Crime Comparison

Figure 1: Comparison of trends in Energy Networks Association reported metal thefts with trends in copper market price, England and Wales, Jan 2009–Dec 2013.



Source: Morgan, Hoare, and Byron, “An Evaluation of Government/law Enforcement Interventions.”

Data derived from the Energy Networks Association related to metal theft incidents and from letsrecycle.com related to copper theft price indexes shows that copper prices have been relatively stagnant since early 2010. In spite of the stagnation of prices, metal theft incidents clearly decreased following the implementation of Operation Tornado in early 2012. This was followed by a further decrease after the implementation of the Scrap Metal Dealers Act of 2013.

Operation Tornado was not successful solely because of enhanced enforcement efforts. If enhanced enforcement and investigation tactics were effective by themselves, then earlier operations, such as Operation Fragment, would have been more successful. The success of Operation Tornado was related specifically to the requirement that all sellers had to present identification and dealers had to keep comprehensive records of all transactions. Operation Tornado's success led to the cashless system of transactions, which greatly reduced metal theft incidents.

There is ample empirical evidence available to show that the programs and strategies initiated in the United Kingdom have resulted in significant reductions in theft incidents, independent of fluctuations in the copper commodity price index. As a whole the United Kingdom scores a rating of 16 out of a possible 20 points on the rating scale developed for this examination. The bulk of the United Kingdom's success lies within its successful implementation of a cashless transaction system for scrap metal. However, the United Kingdom was not the first nation to experiment with a cashless transaction system. The first nation that passed comprehensive legislative reform of the scrap recycling industry was France.

IV. FRANCE

A. INTRODUCTION

Situated on the mainland of Europe, France has long struggled with copper and scrap metal theft. While England's steps to combat the problem with new operations and legislation took off in the beginning of 2012, France passed new regulations and legislation regulating the scrap metal industry in 2010 after a decade of expanded law enforcement efforts. As with the United Kingdom, a detailed examination of France's efforts in the fight against copper theft is necessary in order to determine a viable course for the United States. The detailed examination of France in this chapter is similar to examination in the previous chapter of the United Kingdom. It includes a brief introduction, background the problem to date, a definition of what constitutes critical infrastructure in France, an identification of relevant stakeholders, followed by an examination of regulatory and enforcement efforts to date, and concluding with a results section.

B. BACKGROUND

Copper thieves have long targeted infrastructure within France, although measuring the exact extent of the problem is quite difficult. Statistics related to criminal activity are maintained in the French Ministry of Justice and do not differentiate copper theft from the many other types of larcenies that occur throughout the country. As opposed to in the United Kingdom, there are no independent statistics related to wire theft maintained by any of the various industrial associations. The only meaningful statistics related to copper wire theft are maintained within the law enforcement community and are difficult to verify independently.

As with the United Kingdom, in France, there are ample news reports and anecdotal industry reports that demonstrate the sheer depth of the copper theft problem. Metal thieves are indiscriminate in their targeting of buildings and facilities that contain copper wire. For example, in May of 2014, metal thieves scaled over 20 wind turbines in the French countryside, broke into the engine compartments, and made off with the bulk

of the copper wiring rendering each of the turbines inoperable.¹¹⁶ Electrical infrastructure is, of course, not the only kind of infrastructure targeted by copper thieves.

Rail lines in France have been repeatedly targeted by copper thieves. The national railroad of France states that in 2011, there were nearly eight wire theft incidents a day that ultimately cost approximately \$45,000 USD to repair.¹¹⁷ In addition to the substantial costs of repairing damaged equipment, the railroad also reported approximately 6,000 hours in train delays during calendar year 2011.¹¹⁸ Aside from the financial costs associated with damage to structure, copper thieves also put the traveling public at great risk when they steal copper cabling from essential safety components, such as signaling mechanisms. One theft of 800 meters of signaling cable in central France in 2011 resulted in significant speed restrictions and stop orders for the country's premier TGV high-speed service.¹¹⁹

Aside from rail lines and wind turbines, thieves have also aggressively targeted various other parts of France's critical infrastructure. Attacks have targeted various components of the electrical grid, as evidenced by a case in 2010 when a suspected copper thief was found dead at the bottom of an electrical grid pylon after being electrocuted while attempting to cut wire.¹²⁰ Metal thieves in France operate as organized gangs and are not only well skilled, but also properly equipped to dismantle active power lines and electrical substations.¹²¹ In addition to the electrical grid, thieves have had past success disrupting the telecommunications network within the country. In 2006, thieves

¹¹⁶ "Metal Thieves Pillage French Wind Turbines," France 24, May 28, 2014, <http://www.france24.com/en/20140528-france-metal-organised-thefts-wind-turbines-copper>, accessed August 22, 2015,

¹¹⁷ Kevin Smith, "SNCF Infra Rolls out Cable Theft Detection Device," *International Railway Journal* (September 2014), accessed August 17, 2015, <http://www.railjournal.com/index.php/track/sncf-infra-rolls-out-cable-theft-detection-device.html>.

¹¹⁸ Arnaud Peltier, "Combating Cable Theft," *Railway Strategies for Senior Rail Management*, no. 111 (July 2014), <http://www.railwaystrategies.co.uk/article-page.php?contentid=20850&issueid=601>.

¹¹⁹ "Eurostar Delays after French Thieves Steal Copper Signal Cables from High-speed Tracks," *Daily Mail UK*, April 26, 2011.

¹²⁰ Gus Trompiz, "Copper Theft Booms in France as Prices Soar," Reuters, December 17, 2010, accessed August 17, 2015, <http://www.reuters.com/article/2010/12/17/france-copper-theft-idAFLDE6BF1HO20101217>.

¹²¹ Matthew Craze, and Fouquet Helene, "Soaring Metal Prices Drive Worksite Theft; Gangs in France Pilfer Copper, Nickel Raid High-speed Train Yards, Factories," *Toronto Star*, April 27, 2006.

stole 550 meters of copper cable from France Telecom, resulting in lengthy phone and Internet outages to two different cities.¹²² In France, every aspect of critical infrastructure has been impacted by copper wire theft in recent years.

C. DEFINITION OF CRITICAL INFRASTRUCTURE

Critical infrastructure in France refers to those pieces of infrastructure that:

Provide an essential support for economic and social well-being, for public safety and for the functioning of key government responsibilities, such that disruption or destruction of the infrastructure would result in catastrophic and far-reaching damage.¹²³

The government of France defines critical infrastructure in its country within seven categories: food, water, energy, transport, financial institutions, information and communication systems, and command and decision centers.¹²⁴ Any facility operating within those loosely defined categories is considered to be a part of the country's critical infrastructure.

As with the United Kingdom, in France, each sector denoted by the government as critical infrastructure is vulnerable to the threat of copper wire theft. As noted earlier, thieves often target the transportation sector, causing millions of dollars of damage each year. In addition to the real financial costs of repairing damaged facilities, the reality is that transportation services are greatly disrupted by wire thieves. In 2011, there were over 5,800 hours of recorded delays in France related specifically to copper wire theft incidents.¹²⁵

¹²² "Copper a Theft Magnet," *The Gold Coast Bulletin*, September 16, 2006, Focus sec.

¹²³ Bernhard Hammerli, and Andrea Renda, *Protecting Critical Infrastructure in the EU: CEPS Task Force Report* (Brussels: Centre for European Policy Studies, 2010), http://aei.pitt.edu/15445/1/Critical_Infrastructure_Protection_Final_A4.pdf, 12.

¹²⁴ Michael Jopling, *162 CDS 07 E Rev 1: The Protection of Critical Infrastructures* (Brussels: NATO Parliamentary Assembly Committee, 2007), <http://www.nato-pa.int/default.asp?SHORTCUT=1165>.

¹²⁵ Stratis G. Camatsos, "EU Railway Theft Huge Problem amid Crisis," *News Europe*, April 13, 2012, <http://neurope.eu/article/eu-railway-theft-becoming-epidemic-problem-economic-crisis-stagnates/>.

D. STAKEHOLDER IDENTIFICATION

France has a variety of stakeholders who have a vested interest in attacking the problems associated with copper wire theft throughout the nation. First and foremost are the country's law enforcement components. Law enforcement in France is comprised of three primary types of forces: the National Police, the Gendarmerie de Nationale, and a variety of local police forces that serve under the authority of local elected officials.¹²⁶ Policing in France is highly centralized and the two agencies with the most power and impact on criminal activities are the National Police and the Gendarmerie, which is actually part of the military structure within the country.¹²⁷ The Gendarmerie is a large force with a national footprint and, as such, is the agency that has been charged with combating serious crimes on a national level.¹²⁸ As the copper theft epidemic exploded in Europe in the early part of the twenty-first century, the Gendarmerie was designated the lead agency to combat the problem, in part due to its experience in working in multi-national task forces, as well as its extensive intelligence apparatus.¹²⁹

As with the United Kingdom, there are a variety of corporate entities that have a vested interest in the copper wire trade. In 1988, it was estimated that over 2,700 firms were involved in the scrap recycling business in France, with revenues exceeding \$6 billion U. S. dollars per year.¹³⁰ Corporate scrap entities vary from tiny businesses tucked into French villages to the massive Compagnie Francaise des Ferrailles (CFF), which is based in Paris and controls roughly 35 percent of the ferrous scrap market.¹³¹

There are a variety of industrial trade associations representing the scrap dealers in France. The primary trade association in France is the French Federation of Recycling

¹²⁶ Nicolas Boring, "France," in *Police Weapons in Selected Jurisdictions* (38–43), (Washington, DC: Law Library of Congress, 2014), <https://www.loc.gov/law/help/police-weapons/police-weapons.pdf>.

¹²⁷ "France: The French Police, Structure and Organization," Just Landed, accessed August 20, 2015, <https://www.justlanded.com/english/France/Articles/Culture/The-French-police>.

¹²⁸ *Ibid.*, 1.

¹²⁹ "The Impact of Legislative Change," *Pol-Primett Tackling Metal Left*, no. 2 (winter 2012): 1–4. http://www.agenformedia.com/assets/files/pdf/filemanager/Pol-PRIMETT_Newsletter_-_Winter_2012_PRINT_VERSION.pdf.

¹³⁰ Robert Reid, "Parlez-Vous Scrap?," *Scrap Magazine*, May 1, 1998.

¹³¹ *Ibid.*, 5.

Enterprises (FEDEREC).¹³² The association is extremely powerful within the country and recently aligned itself with the European Recycling Industries' Confederation (EuRIC), which exerts influence throughout the European Union on matters associated with the industry at large.¹³³

Aside from the law enforcement and industrial entities, the French government is the largest stakeholder in the fight against the illicit copper wire trade. In addition, the French government has direct control over the railway systems located throughout the country through its ownership of the French national railway system, the French National Railway (SNCF). The SNCF maintains and monitors approximately 30,000 kilometers of railroad tracks throughout France and provides passenger service to approximately 130 million individuals per year.¹³⁴

In addition to its control over the transportation system, the French government also exerts significant control over the energy market. The distribution of electricity and gas throughout the country has been historically supplied by the Electricite de France corporation, and by law, the government holds at least 70 per cent of the capital and voting rights of it.¹³⁵ Though France's entry in the European Union caused it to pass legislation allowing the entry of private energy companies into the nation, the bulk of utilities within France are still heavily controlled by government ownership and regulation.¹³⁶ As such, the government of France is extremely interested in developing ways to stem the rising tide of copper thefts that directly affect power generation and service dissemination throughout the country.

¹³² "EuRIC to Defend Interests of Europe's Recycling Industries," Recycling International, November 5, 2014, accessed August 10, 2015, <http://www.recyclinginternational.com/recycling-news/8289/other-news/europe/euric-defend-interests-europe-039-s-recycling-industries>.

¹³³ Ibid.

¹³⁴ "Bienvenue Sur La Page D'accueil Du Site SNCF," accessed August 20, 2015, <http://www.sncf.com/>.

¹³⁵ Fabrice Fages, and Myria Saarinen, "The Energy Regulation and Markets Review: France," *Law Business Research* 1 (2012): 86–93.

¹³⁶ Ibid., 89.

E. INTERDICTION, REGULATORY, AND ENFORCEMENT EFFORTS

The French response to the rising number of copper wire thefts within their nation has been varied, relying on a combination of legislative, regulatory, and formal enforcement methods. Due to its location on the main body of continental Europe, France has had to account for metal thieves crossing its borders on a regular basis and operating as part of large continental organized crime organizations.

Initially, as copper prices soared in the mid-2000s, the French undertook a series of coordinated criminal interdiction efforts coupled with new physical security methods. In order to deter the copper wire thieves that attacked railroad infrastructure, the SNCF contracted with the Gendarmerie to provide aerial helicopter patrols, complete with high tech thermal imaging, over its railroad tracks and facilities.¹³⁷ The helicopter patrols were also designed to monitor electrical lines in addition to railroad property. Moreover, in addition to helicopter patrols, SNCF also invested heavily in new technology designed to thwart copper wire thieves. For instance, SNCF has purchased a sophisticated electronic warning system designed to notify the railroad immediately of a theft, while also alerting the police.¹³⁸

While physical security enhancements were implemented, the French government also undertook a variety of law enforcement initiatives. As referenced earlier, the Gendarmerie was designated by the government as the primary lead agency to handle all major metal theft incidents throughout the country. The Gendarmerie operates its cable theft operations through its Central Office for Combating Mobile Criminality (OCLDI).¹³⁹ In June of 2014, the Gendarmerie participated in Operation Capalest, resulting in the arrest of 10 leaders of an organized crime operation in Moldova who were responsible for numerous theft incidents in France.¹⁴⁰ The arrests highlight the difficult

¹³⁷ “€10m Bid to Cut Railway Delays,” *The Connexion*, April 1, 2011, accessed August 19, 2015, <http://www.connexionfrance.com/cut-railway-delays-cable-thefts-copper-sncf-11529-news-article.html>.

¹³⁸ Smith, “SNCF Infra Rolls out Cable Theft Detection Device,” 1.

¹³⁹ “The Impact of Legislative Change,” *Pol-Primett Tackling Metal Left*.

¹⁴⁰ “E General Report on Europol Activities,” Council of the European Union, April 20, 2015, accessed August 23, 2015, <https://www.europol.europa.eu/sites/. . . /europolreview2011.pdf>.

nature of enforcement efforts, as items were stolen in France and were then transported by minibus to Moldova for resale.

The Gendarmerie has worked frequently with international law enforcement organizations to effect arrests related to scrap metal theft and are heavily involved with Europol, Interpol, and Railpol. In early 2013, Gendarmerie officers participated in an operation netting the arrest of multiple individuals in various countries, while seizing approximately 120 tons of stolen copper.¹⁴¹ The complicated nature of the operation, as well as the fact that arrests occurred in multiple nations, highlighted the reality that stolen scrap is often moved from one country to another.¹⁴²

In addition to physical security and law enforcement activities, the French government radically changed laws and regulations with respect to the scrap industry beginning in 2010. In 2010, the French government amended legislation regulating the scrap recycling industry. The French legislation includes the following language:

Article L112-6

Any transaction on the retail purchase of ferrous and non ferrous metal is made by crossed check, bank or postal transfer, or by credit transaction may not exceed a ceiling set by decree. Failure to comply with this requirement is punishable by a ticket for the fifth class.

II. -I Notwithstanding, the costs of the department conceded that exceed the sum of 450 Euros must be paid by bank transfer.¹⁴³

The legislation had the effect of eliminating any cash transactions for copper or other scrap metal of value greater than \$600 U. S. dollars.¹⁴⁴ As in the United Kingdom, no

¹⁴¹ “European Police Raid Scrapyards in Metal Theft Crackdown,” *Global Post*, May 31, 2013, accessed August 10, 2015, <http://www.globalpost.com/dispatch/news/afp/130531/european-police-raid-scrapyards-metal-theft-crackdown>.

¹⁴² Ibid.

¹⁴³ “Article L112-6,” 2011, accessed August 9, 2015, <http://www.legifrance.gouv.fr/affichCodeArticle.do?cidTexte=LEGITEXT000006072026&idArticle=LEGIARTI000006643961&dateTexte=&categorieLien=cid>.

¹⁴⁴ Paul Watson, “France Bans Cash Sales of Gold and Silver over \$600,” September 26, 2011, accessed September 1, 2015, <http://www.infowars.com/france-bans-cash-sales-of-gold-silver-over-600/>.

longer could criminal actors in France receive cash payments from scrap dealers for large amounts of copper or scrap metal.

The French government amended the language of the legislation even further in 2011, eliminating cash transactions from dealers for any scrap metal.¹⁴⁵ Estimates from government and law enforcement experts noted that approximately 80 percent of all payments for scrap metal in France were made in cash prior to the legislation becoming effective.¹⁴⁶

The final piece of the French legislative and regulatory approach to scrap metal theft was the imposition of strict regulations on licensed scrap dealers operating within the country. All scrap dealers are required to maintain a record of all scrap materials purchased, including a description of the item, and a copy of the seller's identification.¹⁴⁷ The dealers are now required to maintain the records for a period of five years, and any violation of the law results in serious criminal penalties including prison time, and heavy monetary fines.¹⁴⁸

F. RESULTS

Due to the lack of statistics specifically related to metal theft offenses within France, it is difficult to accurately determine whether or not the legislative and enforcement efforts have been successful at creating an overall reduction in incidents of metal theft. While statistics are not readily available, the Gendarmerie Nationale's Central Office for Combating Mobile Criminality has reported a significant reduction in metal thefts in calendar year 2012 following the imposition the new laws and regulations.¹⁴⁹ The Gendarmerie has also self-reported that scrap dealers have been

¹⁴⁵ Clare Kane, "Scrap Metal Firms Oppose Bill to Ban Cash Buys," Reuters UK, December 5, 2011, accessed September 3, 2015, <http://uk.reuters.com/article/2011/12/05/uk-britain-scrap-idUKTRE7B40Q920111205>.

¹⁴⁶ Ibid.

¹⁴⁷ Pol-Primett, *Findings of Pol-Primett Research Activities*, 2012, accessed November 5, 2015, <http://www.agenformedia.com/assets/files/pdf/Findings of Pol-PRIMETT research activities.pdf>.

¹⁴⁸ Ibid., 3.

¹⁴⁹ Ibid.

generally compliant with the new regulations and that has caused the resultant reduction in metal theft incidents.

Perhaps another indicator of the success of the new regulations is a little publicized partnership between FEDEREC and the Gendarmerie. At the behest of the French government, the two parties created a joint alert system that relays metal theft alerts between the French Home Office and licensed scrap dealers. The open exchange of information resulted in a steady stream of alerts for metal theft over the first six months of 2012.¹⁵⁰

G. CONCLUSION / ANALYSIS

Without direct statistical evidence, it is difficult to accurately judge the success of the French efforts against metal theft. Judging the initiatives based solely on the Gendarmerie reports, it appears that efforts have been successful overall. A critical evaluation, based on the metrics specified in the methodology section, depicts a nation that has had moderate success in the fight against copper theft.

France, as noted earlier, was the first of the three nations analyzed that has had success in increasing regulation of the scrap dealer trade. With respect to the first metric, evaluating the regulation of the scrap recycling industry, France scores a rating of four. France has been able to effectively gain legislative approval for enhanced regulation of the scrap trade, including the implementation of a cashless transaction system that has changed over time from a system limiting amounts paid in cash to a system that completely banned cash transactions. Furthermore, the French government also instituted harsh penalties for those dealers found in violation of the enhanced legislation.

France does not receive the full score of five on the rating scale due to anecdotal reports that the legislation has had little real effect on the overall crime rate as cross border raids continue to occur. In one interview, a member of a recycling industry association stated his belief that the cash ban did not result in an overall drop in theft

¹⁵⁰ “Cashless Systems and Legislation around These Systems,” Pol-Primett Annual Conference, March 22, 2012, accessed September 2, 2015, www.pol-primett2.org/. . . /content_683_9_Pol-PRIMETT_Conference, http://www.pol-primett2.org/images/files/content_683_9_Pol-PRIMETT%20Conference%202012%20-%20Maud%20Grillard%20Cashless%20Systems.pdf.

incidents simply because stolen material was sent to other countries instead of being resold at licensed scrap dealers.¹⁵¹

The second metric used in this study concerns an evaluation of legal changes related to criminal statutes. In this category, France's efforts rate a one on the scale as it has achieved no real success in creating enhanced penalties for those individuals convicted of stealing copper wire. Furthermore, the legislature within France has not even proposed enhancements aimed at increasing the penalties associated with copper theft.

On the third metric, which rates changes made within the criminal justice enterprise within the nation, France scores a rating of a rating of five. While some of the local agencies and the French National Police have continued to pursue operations against copper thieves, France has consolidated the bulk of copper theft operations under the paramilitary Gendarmerie de Nationale. As a result, the government has been able to effectively centralize operations under one umbrella, leading to better coordination during cross-border operations and the creation of a specific intelligence office that has the ability to compile and analyze statistics specifically related to copper theft. In an area of intelligence-led policing, France has taken the lead by using a specific component within the Gendarmerie to direct law enforcement assets to problem locations in a more timely fashion than any past efforts.

The final metric, which evaluates the overall reduction in copper theft incidents, is difficult to judge within France because of the lack of verifiable statistics related to the crime. Based solely on self-reports from the Gendarmerie, the efforts of the French government in this category produce a score of three. The government has reported a reduction in overall incidents following the implementation of new regulations and law enforcement strategies, but there is no way to quantify a reduction of more than 50 percent without empirical evidence.

Overall, the rating achieved by France on the defined metrics scale is a total of 13, which is lower than the score associated with the United Kingdom, primarily because of

¹⁵¹ Andrew Hough, "£5bn Scrap Metal Industry Told to 'Clean up Act over Thefts Crime Wave,'" *The Telegraph*, January 6, 2012, accessed September 3, 2015, <http://www.telegraph.co.uk/news/uknews/crime/8994797/5bn-scrap-metal-industry-told-to-clean-up-act-over-thefts-crime-wave.html>.

the lack of verifiable statistics related to copper theft incidents within the nation. It does appear, however, that cashless scrap metal policies have had an effect on the illicit copper theft trade in both the United Kingdom and France—notwithstanding the anecdotal evidence of cross border theft issues in France. Other nations have not been successful at passing “cashless” trade legislation and regulation and instead have focused on more traditional methods to combat the problem. Italy, in particular, has been at the forefront of the metal theft fight since the copper prices began to soar in the early part of the twenty-first century. Italy’s efforts are discussed in the next chapter.

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V. ITALY

A. INTRODUCTION

While also situated on the mainland of continental Europe, Italy's experience with the copper wire theft epidemic has differed significantly from France. The enforcement and regulatory efforts attempted within Italy have also been very different from those utilized in the United Kingdom. The bulk of enforcement efforts within the United Kingdom and France have been aimed at eliminating the ability of criminals to obtain large sums of money within their borders for scrap metal.

In Italy, the copper theft epidemic is generally related to complex cross-border operations operated by sophisticated organized crime networks.¹⁵² Italy's position on the continent of Europe places it much closer to former Soviet satellite nations than the United Kingdom or France. Organized crime in the former Soviet Eastern Bloc nations exploded after the revolutions of 1989, particularly in nations such as Hungary and the countries that formerly made up Czechoslovakia.¹⁵³ The proximity of the Eastern Block organized crime gangs in relation to Italy makes copper in Italy a far easier target than undertaking longer journeys to France or across the English Channel into the United Kingdom. As such, Italy's reaction to the epidemic has been far different from its European allies.

This chapter provides a background of the extent of the problem in Italy, identification of critical infrastructure and those stakeholders within the country that have an interest in copper theft operations, as well as an identification of the regulatory and enforcement methods used by Italian authorities, followed by a review of the results of those operations, and a brief analysis of the overall effect of enforcement methods.

¹⁵² Tony Barber, "Italian Gangs Take a Shine to Stealing Copper Goods," *The Financial Times Limited*, November 15, 2006, Business and Economics sec.

¹⁵³ Kelly Hignett, "Organised Crime in East Central Europe: The Czech Republic, Hungary and Poland," *Global Crime* 6, no. 1 (2004) 70, http://www.rect.muni.cz/summerschool/International_Security/Module%204/organised%20crime%20in%20east%20central%20europe%20-%20czech%20republic,%20hungary,%20poland%20-%20Hignett.pdf.

B. BACKGROUND

Italy as a nation historically has been a heavy consumer of copper and in 2013 was listed as the sixth largest consumer of copper in the world.¹⁵⁴ Copper is a scarce commodity within Italy and a product that is heavily sought after by criminals operating on the black market. Italy's consumption of copper is significantly higher than the United Kingdom or France; neither of those two nation's status lies within the top 10 of copper consumers in the world, as does Italy.¹⁵⁵ Italy is not a major producer of copper, and as a result, the nation focuses heavily on recycled copper to satisfy its significant demand for the product.¹⁵⁶

Between 2009 and 2011, research by Pol-Primett estimated that incidents of copper theft increased by approximately 70 percent.¹⁵⁷ The corresponding price of copper during that time rose approximately 200 percent from a price of approximately \$3,000 USC per ton in 2009 to approximately \$9,000 USC in 2011.¹⁵⁸ The significant increase in the price of copper likely drove the corresponding spike in the theft of copper from facilities throughout Italy. Unfortunately, there is no public clearinghouse or statistical data that relate specifically to copper and scrap metal theft, so all statistics for Italy are compiled from reports issued by various stakeholders.

As with other European countries, one of the industries hardest hit by copper thieves in Italy is the transportation industry. In 2010, the national railways of Italy

¹⁵⁴ "A Country Profile: Italy," *Pol-Primett Newsletter* (summer 2013), accessed August 9, 2015, www.pol-primett2.org/images/files/content_690_3_Pol-PRIMETT%2520newsletter%2520research.pdf+&ccd=1&hl=en&ct=clnk&gl=us.

¹⁵⁵ Daniela Rojas et al., *Copper Theft Trends Report: Status Report for 2012 and Prospects for 2013–2014* (Santiago, Chile: Cochilco, Research and Planning Department, 2013), http://www.cochilco.cl/descargas/english/research/quarterly/20121129115000_Copper-Market-Trends-Report-August-October-2012.pdf, 11.

¹⁵⁶ Pol-Primett, *Findings of Pol-Primett Research Activities*, 3.

¹⁵⁷ *7th Expert User Group Meeting Report*, 7th Expert User Group Meeting, Pol-Primett Valencia, Spain, November 20, 2012, accessed July 12, 2015, http://www.policialocalvalencia.es/files/rp21660/pol_primett/Pol-PRIMETT EUG7 report.pdf.

¹⁵⁸ Sidebottom, Ashby, and Johnson, "Copper Cable Theft: Revisiting the Price-Theft," 692.

reported nearly 45,000 minutes of delays associated with copper wire theft incidents.¹⁵⁹ The number of theft incidents related to railroad property within Italy is staggering. In 2012, the state railroad of Italy reported 2137 incidents, followed by 2056 incidents in 2013, and a projected number of 2140 in 2014.¹⁶⁰ Each separate incident has the potential to cause major disruptions to the entire railroad system within the country as well as endangering the lives of the traveling public. In addition to railroad property located in sparsely populated areas in the countryside, thieves have also brazenly targeted large stations in populated city centers. In one attack in January of 2011, thieves stole safety wiring from a station in Rome, causing nearly six hours of delays during the morning rush hour.¹⁶¹

Other utilities have also been repeatedly targeted by copper thieves in Italy. In June of 2013, Italian police arrested a Romanian citizen who was caught with nearly a ton of telephone wire in the trunk of his vehicle.¹⁶² Damage to the telecommunications systems in the country not only disrupts business and personal endeavors, but it also greatly effects public safety as first responders do not receive calls as a result of damaged phone and Internet lines. In one location in southern Italy in 2010, the nation's primary phone service provider, Telecom Italia, reported a total of 38 incidents of theft totaling over 45 kilometers of copper cable stolen, resulting in numerous and prolonged service disruptions.¹⁶³

The electrical grid in Italy has also suffered greatly at the hands of copper thieves within Italy. In calendar year 2010, for instance, one of the nation's largest electricity

¹⁵⁹ Nick Vinocur, and Svetlana Kovalyova, "Thieves, Railways in a War: Copper Thefts Disrupt High-speed Commutes as Europe Reports Millions of Dollars in Losses," April 12, 2011, <http://www.reuters.com/article/2011/04/12/uk-europe-copper-idUSLNE73B04N20110412>.

¹⁶⁰ Maria Fiorentino, "Metal Theft: The Italian Railway Infrastructure" (presented at Pol-Primett Annual Conference, April 23, 2013, accessed July 8, 2015, [http://www.pol-primett2.org/images/files/content_702_5_Ferrovie%20dello%20Stato%20\(Fiorentino\)%20-%20presentation.pdf](http://www.pol-primett2.org/images/files/content_702_5_Ferrovie%20dello%20Stato%20(Fiorentino)%20-%20presentation.pdf)).

¹⁶¹ Vinocur, and Kovalyova "Thieves, Railways in a War."

¹⁶² "Italy: Romanian Arrested on Suspicion of Stealing a Tonne of Copper," *McClatchy—Tribune Business News*, June 11, 2013.

¹⁶³ Salvo Sidoti, "Adrano: Nuovo Furto Di Rame in Contrada Contrasto, Aziende Ancora Isolate [Adrano: New Copper Theft in the District Contrast, Companies Still Isolated]" *La Sicilia*, December 20, 2010, accessed August 10, 2015, <http://obbiettivoadrano.it/adrano-nuovo-furto-di-rame-in-contrada-contrasto-aziende-ancora-isolate/>.

providers, Enel, reported a total of 2,189 copper incidents resulting in monetary damages of approximately \$17 million U. S. dollars.¹⁶⁴ Newspapers articles and governmental publications are littered with anecdotal stories about theft from the electrical grid, including graphic descriptions of offenders electrocuted while attempting to steal copper from live wires.

C. DEFINITION OF CRITICAL INFRASTRUCTURE

As opposed to many other European Union nations, Italy has not passed any formal legislation or issued any governmental decrees specifically declaring what defines critical infrastructure within the country. While there has been no official governmental declaration, various publications and agreements with the European Union have produced a snapshot of what constitutes critical infrastructure within the nation. Those categories include banking and finance, public safety and order, telecommunications, emergency services, energy production, public administration, health care, transportation, and defense structures.¹⁶⁵

While Italy has not taken steps to formalize its definition of critical infrastructure assets, the nation is an active member of the European Union whose charter defines critical infrastructure for member nations as

an asset, system or part thereof located in member states which is essential for the maintenance of vital societal functions, health, safety, security, economic or social wellbeing of people, and the disruption or destruction of which would have a significant impact in a member state as a result of the failure to maintain those functions.¹⁶⁶

Within those identified areas, there is a broad array of stakeholders that have a significant interest in mitigating the destabilizing and damaging consequences associated with copper wire theft.

¹⁶⁴ Pol-Primett, *Findings of Pol-Primett Research Activities*.

¹⁶⁵ Manuel Suter, and Elgin Brunner, "Critical Information Infrastructure Protection, Italy," in *International CIP Handbook 2008/2009*, ed. Andreas Wenger, Victor Mauer, and Myriam Dunn Cavely (Zurich: Centre for Security Studies, 2009, <http://www.css.ethz.ch/publications/pdfs/CIIP-HB-08-09.pdf>).

¹⁶⁶ "Council Directive 2008/114/EC of 8 December 2008 on the Identification and Designation of European Critical Infrastructures and the Assessment of the Need to Improve Their Protection," accessed November 5, 2015, <http://eur-lex.europa.eu/legal-content/EN/TXT/?uri=URISERV:jl0013>.

D. STAKEHOLDER IDENTIFICATION

In Italy, the most important stakeholder in the fight against metal theft is the law enforcement community. Law enforcement operations in Italy are controlled at the national level and dictated by the constitution, which decrees that the government has strict control over matters concerning state security, ammunition, and explosives.¹⁶⁷ The specific role of law enforcement is handled by four distinct entities: the National Police, the Carabinieri, the Financial Crime Investigation Unit, and the Penitentiary Police Corps.¹⁶⁸ Determining which part of the law enforcement community that deals specifically with wire and copper theft is complicated by the structure of policing in Italy.

The National Police have specialty services that enforce matters related to highways, railroads, and telecommunications while the Carabinieri have its own special operations divisions that handle economically sensitive issues such as large-scale organized crime operations.¹⁶⁹ Further complicating jurisdictional issues is the reality that the Financial Crime Investigation Unit is specifically charged with enforcement related to smuggling operations and organized crime.¹⁷⁰ Not surprisingly, it is well known that the National Police and the Carabinieri have been engaged jurisdictional battles for over a hundred years to determine which has primary authority in a variety of situations.¹⁷¹ Therefore, enforcement efforts are heavily impacted by a determination of which sector of infrastructure has been victimized by copper thieves.

The railroad sector, though also operated solely as a state run function, is far less complicated than the law enforcement sector. Within Italy, the primary stakeholder concerned with the protection of railroads is the Rete Ferroviaria Italiana (RFI), which is

¹⁶⁷ Dante Figueroa, "Italy" in *Police Weapons in Selected Jurisdictions* (53–57) (Washington, DC: Law Library of Congress, 2014), <https://www.loc.gov/law/help/police-weapons/police-weapons.pdf>.

¹⁶⁸ *Ibid.*, 53.

¹⁶⁹ *Ibid.*

¹⁷⁰ *Ibid.*

¹⁷¹ David Bayley, "Police Function, Structure, and Control in Western Europe and North America: Comparative and Historical Studies," *Crime and Justice* 1 (1979): 109–143.

the state-run body charged with the overall care of the entire Italian railway network.¹⁷² While the RFI is responsible for the infrastructure within Italy, the primary operating company is Trenitalia, which like the RFI is owned by the government under the broad railroad holding corporation known as Ferroviedello Stato Italiane (FSI).¹⁷³ Utilizing its subsidiaries, the FSI is responsible for operating and maintaining approximately 16,000 kilometers of railroad throughout Italy. To police the railroad, the National Police created the Italian Railway Police (POLFER) unit in 1920 specifically to protect the trains, passengers, and properties of the state run railroads.¹⁷⁴

The segment of the telecommunications industry that is most affected by copper wire theft is the hard line structure utilized by traditional telephonic systems and the cabling structure that supports Internet connectivity throughout the nation. The primary stakeholder in the telecommunications field is Telecom Italia, formed as the result of a merger of five state run holding companies dating back to the Mussolini government.¹⁷⁵ Over the past 14 years, the telecommunications industry in Italy has become more open to private enterprise, and the Telefonica corporation operates in direct competition with Telecom Italia, as well as being a minority shareholder in Telecom Italia.¹⁷⁶ Telecom Italia and Telefonica have both been hard hit by copper thieves in recent years and have sought ways to reduce damages and operating outages.

While the railroad industry and telecommunications industries have not been significantly impacted by deregulation, the energy market has been heavily impacted. The major power distributors in Italy are all operated by private entities. There are four

¹⁷² “High Speed Rail Operations, Italy,” accessed September 1, 2015, <http://www.railway-technology.com/projects/italy/>.

¹⁷³ Angelo Salento, and Giuseppe Pesare, “From Liberalisation to Appropriation: The Trajectory of Italian Railways,” July 4, 2015, SASE, <https://sase.confex.com/sase/2015am/webprogram/Paper2508.html>.

¹⁷⁴ Fiorentino, “Metal Theft: The Italian Railway Infrastructure,” 30–31.

¹⁷⁵ “Telecom Italia Mobile: Company History,” International Director of Company Histories, 2004, accessed September 4, 2015, <http://www.company-histories.com/Telecom-Italia-Mobile-SpA-Company-History.html>.

¹⁷⁶ Lisa Jucca “Chairman Candidate Says Telecom Italia Must Act as True Public Company,” Reuters UK, March 28, 2014, accessed September 3, 2015, <http://uk.reuters.com/article/2014/03/28/uk-telecom-chairman-idUKBREA2R1NY20140328>.

main service providers operating in the country: Enel, Edison, E. On, and Edipower.¹⁷⁷ Each of the providers has been adversely affected by copper thieves and has suffered extensive financial losses and prolonged power outages due to theft incidents from the electrical grid as well as company facilities. As noted earlier, Enel reported 2189 theft incidents in 2010, which accounted for only one quarter of reported incidents from the four major corporations. The high voltage grid and transmission lines are owned almost exclusively by the TernaSpA corporation, a company that is controlled by the Italian government.¹⁷⁸ Therefore, the Italian government continues to have a strong interest in maintaining the electrical grid and preventing large-scale copper theft.

Aside from government entities and the transportation and electrical service providers, the other primary stakeholders in the fight against copper theft in Italy are those businesses that work in the scrap metal industry. Businesses that work in the scrap metal industry are generally represented by the ASSOFERMET association, which represents approximately 1100 corporations, 600 of which have reported being actively involved in the scrap metal trade.¹⁷⁹ Due to the overall size of the scrap recycling industry within Italy, the ASSOFERMET association holds considerable political sway and influence with the Italian government and has the ability to change the course of any legislation related to regulation of the industry.

E. INTERDICTION, REGULATORY, AND ENFORCEMENT EFFORTS

Unlike France and the United Kingdom, Italy has not embraced sweeping legislative and regulatory reform to address the copper theft epidemic. Instead, Italy has instead relied on traditional enforcement methods and enhanced collaboration between the various stakeholders interested in reducing the volume of incidents occurring throughout the country.

¹⁷⁷ Deloitte, *European Energy Market Reform: Country Profile: Italy*, (Zurich: Creative Studio, 2015), <https://www2.deloitte.com/content/dam/Deloitte/global/Documents/Energy-and-Resources/gx-er-market-reform-italy.pdf>.

¹⁷⁸ Schwartz David, "The Energy Regulation and Markets Review: Italy," Law Business Research, 2012, <https://www.lw.com/thoughtLeadership/energy-regulation-markets-review-italy-2012>.

¹⁷⁹ S. Risica, and C. Nuccetelli, *The Italian Experience and Policy on Radioactive Contamination of Metal Scrap* National Institute of Health, accessed September 2, 2015, <http://www.irpa.net/irpa10/cdrom/00052.pdf>.

Law enforcement operations within Italy have generally consisted of three different levels of operations. The first level focuses on action against individual offenders and organized crime groups, the second level on detecting black market handling channels, and the third on detecting illegally export channels.¹⁸⁰ To operate effectively in all three levels, every organization within the Italian law enforcement apparatus must cooperate with its sister organizations. As noted previously before, cooperation has been difficult between some of the agencies due to longstanding rivalries, which ultimately has a negative effect on the overall impact of enforcement operations.

There are three interconnected operations that targeted metal thieves suspected of targeting the Italian Railway network and are illustrative of operational success when agencies actually cooperated. The operation, known as Cuprum Novum (A New Copper), targeted both the individuals responsible for stealing the copper as well as the companies responsible for the purchase of stolen goods.¹⁸¹ Working in unison, Italian law enforcement agencies were able to determine that two companies encouraged an organized crime group with origins in Romania to steal scrap from the Italian Railway network for eventual resale.¹⁸² Following a series of wire-taps, Italian authorities determined that the businesses assured the group that any copper stolen from the railroad would be cut to hide any distinguishing features, thereby greatly reducing the likelihood of arrest and eventual prosecution.¹⁸³

Law enforcement operations, such as Cuprum Novum, are the primary tool used by the Italian government to attempt to stem the tide of wire theft within its nation. Unfortunately, statistics from the railroad industry alone show that law enforcement operations have had little effect as a meaningful deterrent for copper theft operations. In 2009 and 2010, the rail network reported losses each year related to wire theft of over 10

¹⁸⁰ Stefano Delfini, "Italian Enforcement Activities" [PowerPoint], Pol-Primett Tackling Metal Theft, accessed September 9, 2015, http://www.pol-primett2.org/images/files/content_683_5_Pol-PRIMETT%20Conference%2020312%20-%20Stefano%20Delfini%20Ministero%20Dell'Interno.pdf.

¹⁸¹ Pol-Primett, *Findings of Pol-Primett Research Activities*.

¹⁸² *Ibid.*, 110.

¹⁸³ *Ibid.*, 112.

million Euros, a significant increase over losses from earlier years when law enforcement operations began to take shape.¹⁸⁴

In an effort to stem the tide of copper theft, the Italian legislature undertook discussion of various reform bills. Due to extensive political disagreements, the legislature was only able to pass legislation amending the criminal code in 2012 to add aggravating circumstances to any theft found to involve scrap metal. The legislation specifically added stronger penalties for any offense deemed to be linked to the theft and the “handling and receiving of copper, metal components or other material stolen from infrastructures for power supply, transport, telecommunications, or other public services which are managed by public/private entities under public concession schemes.”¹⁸⁵ Specific penalties were not stipulated in the legislation, however, and adjudication was left to local courts to determine.

Aside from traditional law enforcement efforts and minimal legislative changes, the Italian government did develop an innovative and collaborative program consisting of a variety of the primary stakeholders in the effort to curb copper theft. In 2012, the Minister of the Interior established the National Monitoring Centre on Copper Theft, designed to enhance cooperation between law enforcement entities and the companies most directly exposed to copper theft.¹⁸⁶ The center was initially established in 2012 and included the following members: The Minister of the Interior (representing the National Police and the Carabinieri), the Italian Customs Agency, Ferrovie dello Stato Italiane, EnelSpA, Telecom Italia, and the ANIE Federation.¹⁸⁷ Aside from monitoring incidents of copper theft, the group’s charter also charged it with proposing strategies to prevent

¹⁸⁴ Ibid., 60.

¹⁸⁵ Council of the European Union, *Exploratory Discussion Paper on Establishing a European Operational Network to Counter Metal Theft, Including a Questionnaire* [memorandum], June 6, 2014, accessed August 22, 2015, http://www.parlament.gv.at/PAKT/EU/XXV/EU/02/84/EU_28452/imfname_10473504.pdf.

¹⁸⁶ EUCPN Newsletter June 2012, *European Crime Prevention Network* (June 2012), http://eucpn.org/sites/default/files/content/download/files/2012_06_eucpn_newsletter_june_2012.pdf.

¹⁸⁷ Ministry of the Interior, *Memorandum of Understanding between the Ministry of Interior, the Customs Agency, Ferrovie Dello Stato Italiane SPA, Enel SPA, Telecom Italia SPA, ANIE for the Establishment of the National Monitoring Centre on Copper Theft*, 2012, accessed September 3, 2015, http://www1.interno.gov.it/mininterno/export/sites/default/it/assets/files/27/2013_12_17_protocollo_istitutivo.pdf.

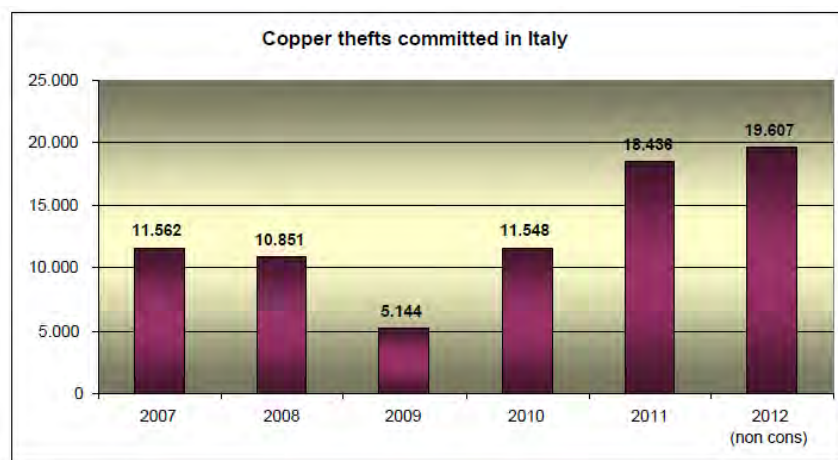
and fight the crime, as well as with proposing new legislation or amendments to existing legislation.¹⁸⁸

Perhaps the most unique part of the monitoring center's charter is the call for the group to develop and promote advertising campaigns to raise public awareness of the seriousness of the metal theft phenomenon.¹⁸⁹ One of the problems noted repeatedly within many countries affected by copper theft is the general lack of knowledge about the seriousness of the problem by politicians and the general public. With a charge to create advertising campaigns, it appears the Italian government has created a mechanism to increase awareness in order to effect change within its own legislature and public.

F. RESULTS

In spite of the uniqueness of the National Monitoring Centre, the enhanced legislation and continued law enforcement efforts, it appears that the various stakeholders in Italy have had very little success at reducing the amount of metal theft within the country. Table 4 shows the clear rise of copper theft incidents within Italy prior to the creation of the National Monitoring Centre.

Table 4. Italian Copper Theft Incidents



Source: Pol-Primett, *Findings of Pol-Primett Research Activities*.

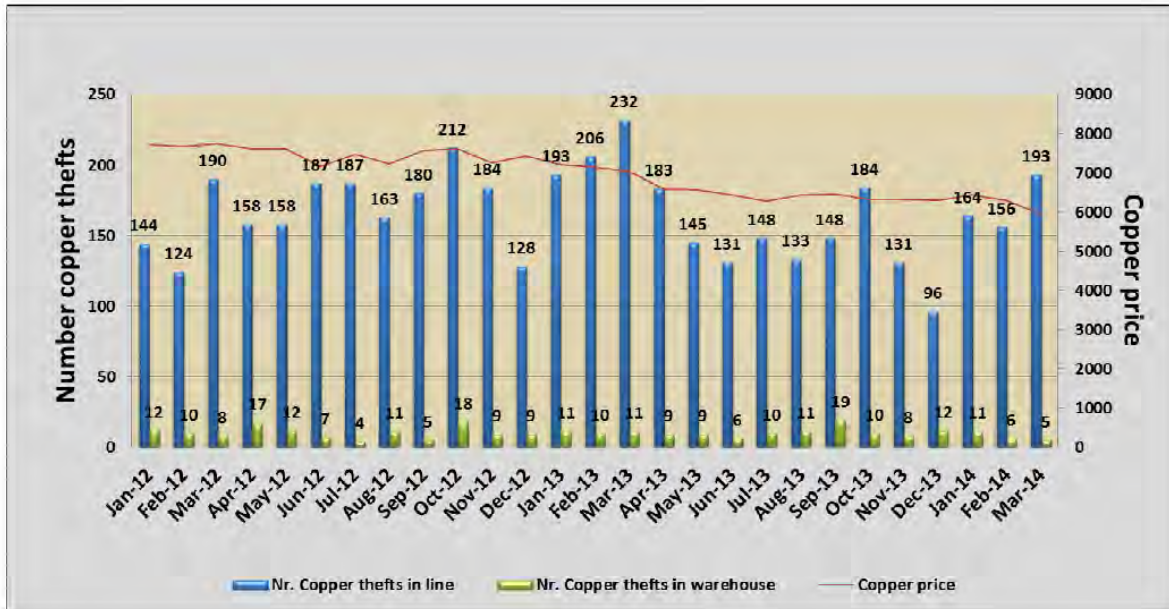
¹⁸⁸ Ibid., 2.

¹⁸⁹ Ibid., 3.

As noted in Table 4, reported theft incidents related to copper wire grew steadily from 2009 through 2012, the year of the creation of the National Monitoring Centre. Clearly, the Italian government hoped the center would provide a mechanism to reduce incidents throughout the country.

Unfortunately, statistical evidence obtained from the FerrovieDelloStatoItaliane regarding railway thefts (illustrated in Figure 5) indicates that none of the aforementioned programs, including the National Monitoring Centre, have had any real effect on the copper theft epidemic.

Figure 5. Copper Thefts on Railroad Property



Source: Delfini, "Italian Enforcement Activities."

As noted from the evidence above (Figure 5), the statistical trend line for reported copper theft incidents against railroad property has not significantly changed from January of 2012 through March 2014. While there were some notable decreases in 2013, including only 96 offenses in December of 2013, the overall trend still suggests that the programs have not had any meaningful impact on reducing incidents of copper theft.

G. CONCLUSION / ANALYSIS

The Italian experience with copper theft has been very different from that of the United Kingdom and France. In spite of an ever-growing number of copper theft incidents, the Italians have failed to settle on a unified approach to the problem and continue to be plagued by significant theft incidents instigated by organized crime elements within its nation and from the former Eastern Block nations. When measured against the defined metrics of this project, it is clear to see that the Italians have failed at virtually every measurable metric that defines success in the fight against copper theft.

On the first metric, which measures the enhancement of regulation related to the scrap recycling industry, Italian efforts result in a rating of two. There have been many legislative proposals; however, none has advanced to a vote within Italian parliament, and no proposal has achieved the necessary acceptance of all relevant stakeholders to shepherd it through the legislative process.

With respect to the creation of enhanced criminal statutes, the second metric, Italy's efforts have resulted in a rating of three. Italy has proposed and passed significant criminal statutes that increase the penalties associated with those convicted of copper wire offenses within their borders. Italy's score within this metric is not higher simply because the approved federal legislation is often ignored by various elements within the Italian judiciary, particularly those in areas typically associated with organized crime, such as Sicily. In order to achieve a higher score, Italy would have had to ensure that the legislation was not only approved but that it was universally adhered to throughout the nation and resulted in a documented reduction in the level of theft incidents in every region.

Italy also receives a mediocre score on the third metric, which measures changes in the criminal justice strategy related to the copper theft epidemic. Italy did succeed in the creation of a National Monitoring Centre, responsible for tracking theft incidents, which raised its score within the metric to a rating of three. To date, Italy has failed to resolve a century old feud between its two primary national police forces, and as a result it has been unable to develop a comprehensive national strategy comprised of centralized

enforcement operations. Italy instead relies on multiple agencies to attack the problem, and each agency represents itself in international operations rather than presenting a unified front to its international partners.

On the final metric, which measures the overall reduction in copper theft incidents within its nation, Italy receives a net score of one. Italy has failed to achieve any measurable decline in copper thefts, and anecdotal evidence provided by a variety of stakeholders actually suggests that copper theft incidents have steadily risen in spite of the various programs and initiatives that have been tried within the country.

The Italian efforts, while admirable, lacked the legislative strength of its counterparts in the United Kingdom and France. As a result, the overall score for Italy is the lowest of the three nations measured, with an overall net score of nine. Italian infrastructure continues to suffer at the hands of copper thieves, in spite of numerous law enforcement operations, the creation of the National Copper Theft Monitoring Centre and legislation that called for enhanced criminal penalties for those convicted of stealing copper.

There are a variety of reasons why Italian efforts to curb incidents of copper theft within its border have failed. Unless Italy can find a constructive way to confront cross-border organized crime, or craft new regulations on the scrap recycling industry, it does not appear that any of its efforts will be met with verifiable statistical success.

Of the three countries reviewed, Italy has had the least measurable success at decreasing the amount of copper theft incidents in its borders. A review of all three nations examined, coupled with a review of past efforts in the United States should result in a viable template for any nation struggling to confront the rising problem of copper theft.

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VI. ANALYSIS

A. INTRODUCTION

The examinations of the methods utilized in the United Kingdom, France, and Italy in the previous three chapters have resulted in the identification of three varied approaches to the copper theft epidemic. The approaches, while each designed to combat the same problem, were unique in the manner in which they attacked the underlying copper theft dilemma. One nation, United Kingdom, relied on the abolishment of all cash transactions for scrap metal in addition to a fundamental change in law enforcement practices. Another nation, France, initially banned cash transactions over a specified monetary threshold prior to a full ban on cash transactions while also enacting increased criminal penalties for violations of the enhanced regulations imposed upon the scrap recycling industry. The third nation, Italy, did not pass any legislation specifically related to the scrap metal trade and instead focused its efforts on enforcing existing laws and passing legislation that imposed greater penalties for those convicted of scrap metal theft.

This chapter also includes an examination of the practical applicability of each case study to the United States, including an analysis of whether or not any of the programs portrayed in the studies have been attempted in the United States, followed by an analysis of whether or not those efforts achieved any measurable success within U. S. borders. The analysis progresses from the country that demonstrated the least amount of measured success in reducing incidents of copper theft success to the country that demonstrated the most success.

Each nation attempted a variety of different law enforcement methods before progressing to regulatory and legal changes. France and the United Kingdom were successful in passing enhanced regulatory and legal measures, while Italy has been unable to pass any comprehensive legislation and instead has continued to rely on law enforcement operations and criminal prosecutions as the main weapon in its fight.

Ultimately, each country received an individual score based on the research design metrics for this study. Each nation was evaluated across four metrics: a review of

changes to regulatory measures related to the scrap recycling industry, an evaluation of legal measures designed to enhance criminal penalties for convicted copper thieves, a critique of changes in the national criminal justice strategy, and finally an overall evaluation of the net change in number of reported copper theft incidents based on the initiatives undertaken in each nation. The United Kingdom achieved the highest score with a rating of 16, followed by France with a rating of 13, with Italy scoring the lowest rating at a level of nine. A comparison of the scores of each nation show the direct linkage between its scores and the disparate methods it utilized to combat the copper theft epidemic.

While it was necessary to individually rate each nation, it is also necessary to examine the wide variety of external factors and influences within each nation that may have contributed the overall success or failure of the nation to achieve positive results. Furthermore, it is also important to analyze whether or not those external influences rendered newly enhanced policies and regulations ineffective.

B. THE MINIMALIST APPROACH—ITALY

Of the three nations that were reviewed in this project, the effort undertaken by the Italian government could easily be described as the most minimalistic approach to solving the copper theft problem. A review of the efforts of the Italians revealed that they achieved moderate success in only two of the four metrics utilized in this thesis.

Italy has not proposed nor passed any legislation mandating increased regulation on the scrap recycling industry and to date it has been unable to develop a comprehensive nationwide plan to attack the copper theft epidemic. Instead, Italy has relied on the passage of laws stipulating enhanced penalties for those convicted of copper wire theft. The Italian government did successfully create a public-private partnership that resulted in the creation of a National Monitoring Centre on Copper Theft, which was a positive change for law enforcement tactics and cooperation within the country. The results of the Italian approach are not encouraging; however, their inability to measurably reduce incidents of copper wire theft in their nation is the result of a wide variety of internal and external factors.

The government of Italy does not maintain statistical data directly related to copper theft. As such, the metrics used to analyze the efforts of the Italian government in the case study were heavily reliant on statistics provided by those industries most directly affected by copper wire theft (energy corporations and the national railroad company) as well as anecdotal media reports. By either measure, the data demonstrated that Italian anti-copper theft efforts failed at reducing reported incidents of copper theft.

In addition to data presented by the Italian state railroad corporation in the case study, which demonstrated that copper theft levels remained virtually unchanged since early 2012, anecdotal news stories captured data from the National Monitoring Centre showed an overall rise in copper theft incidents in Italy. Data from the center published in 2013, a year after the center's creation, showed a 41 percent rise in the amount of individuals detained by police forces in Italy between 2012 and 2013 for suspicion of copper theft.¹⁹⁰ While it is encouraging to note that more individuals were detained in the year following the creation of the center, the rise in detentions likely corresponded to a rise in reported theft incidents.

The data presented in the case study effectively demonstrated that Italian efforts to reduce incidents of copper wire theft have been an abject failure when compared to the United Kingdom and France. The cumulative failure to produce meaningful reductions is the result of a variety of factors including: the creation of weak criminal justice reform efforts undermined by local politics, the failure to enact legislation similar to their European Union nation counterparts, and the explosive growth of international organized crime in former Eastern Bloc nations. An analysis of each of those three factors demonstrates how they worked together to undermine Italian reform efforts.

First and foremost, the enhanced penalties passed as the result of an amendment to the criminal code in 2012 have proven ineffective at reducing copper theft incidents in those areas most directly affected by the epidemic primarily because many local areas within Italy simply ignore federal legislation and operate as lawless autonomous regions. Italy has existed for much of its history as a country governed by local communities, and

¹⁹⁰ "Copper Theft on the Rise in Crisis-hit Italy," *The Local*, November 22, 2013, accessed October 1, 2015, <http://www.thelocal.it/20131122/copper-theft-on-the-rise-in-crisis-hit-italy>.

the black market economy has thrived as federal legislation has rarely been recognized in large segments of the nation.¹⁹¹

The ENEL Corporation's record of metal theft incidents in Italy in 2010 revealed that the two regions with the highest number of reported copper theft incidents were Sicily and Puglia.¹⁹² Both regions have historically been associated with organized crime. In fact, a report issued by EuroPol in 2013 noted that organized crime outfits in both regions act as veritable shadow states exercising control over local governments and operating outside the bounds of federal authority.¹⁹³ In areas heavily populated by organized crime elements enhanced criminal sanctions are generally rendered meaningless by criminal courts that tend to be packed with corrupt judges that slow down or completely obstruct investigations.¹⁹⁴ The end result is that copper theft, and other crime, continues unabated in spite of enhanced penalty legislation.

The failure to enact regulatory reform similar to that in other European nations was not the result of organized crime elements, however. Instead industrial elements, such as the various scrap recycling industry associations within the country, have fought and successfully lobbied to limit additional regulatory control over the businesses they represent. Government infighting and the ability to assemble effective parliamentary coalitions have also resulted in a situation where legislative efforts continually failed to gain positive traction.

The legislative gridlock within Italy over the past 15 years has been highly publicized by news reports that even detail a fistfight between two lawmakers from the northern section of the country on the floor of parliament in 2011.¹⁹⁵ The governments of

¹⁹¹ William Hay, "Is Italy the Next to Fall?" *The National Interest*, November 20, 2011, accessed October 2, 2015, <http://nationalinterest.org/commentary/italy-the-next-fall-6182>.

¹⁹² Pol-Primett, *Findings of Pol-Primett Research Activities*.

¹⁹³ "Threat Assessment: Italian Organized Crime," EuroPol, 2013, accessed October 1, 2015, <https://www.europol.europa.eu/content/threat-assessment-italian-organised-crime>.

¹⁹⁴ Edgardo Buscaglia, and Jan Van Dijk, "Controlling Organized Crime and Corruption in the Public Sector," *Forum on Crime and Society* 3, no. 1 (2003): 12.

¹⁹⁵ Peter Guest, "Fist Fight in Italian Parliament," *The Huffington Post UK*, October 26, 2011, accessed October 5, 2015, http://www.huffingtonpost.co.uk/2011/10/26/eurozone-crisis-fist-fight_n_1032716.html.

France and the United Kingdom were able to overcome considerable opposition and internal squabbling to pass meaningful regulatory reform measures that produced measurable reductions in copper theft. However, Italy was only able to pass laws enhancing criminal penalties and creating the National Monitoring Centre, neither initiative resulted in a measureable reduction in thefts.

Aside from weak legislation and the internal problems associated with organized crime elements in the country, the failure of Italy to reduce copper theft incidents is also attributable to its positioning on the continent of Europe. Italian initiatives have been heavily undermined by cross-border theft operations perpetrated by organized crime gangs operating out of Romania, Hungary, Bulgaria, and countries in the Balkan region. A study by the Federation of American Scientists (FAS) found that Italian organized crime groups were particularly adept at forming partnerships with local criminal groups in the former communist bloc nations.¹⁹⁶

A map published by the FAS shows a diagram of smuggling routes for other illicit items including narcotics and stolen vehicles (see Figure 6). The map, published in 2000, pre-dated the explosion in copper theft incidents but serves as an illustration of just how pervasive potential copper smuggling routes are in and out of Italy to Eastern European countries.

¹⁹⁶ “International Crime Threat Assessment,” Federation of American Scientists, December 1, 2000, accessed October 2, 2015, <http://fas.org/irp/threat/pub45270chap3.html>.

Figure 6. Balkan Smuggling Routes



Source: "Smuggling Routes through the Balkans" [image], Federation of American Scientists, accessed November 18, 2015, <http://fas.org/irp/threat/754791.gif>.

If one of the primary reasons that Italy has been unable to stem the rising tide of copper theft incidents is cross-border organized crime activities, how then has France, also a country on mainland continental Europe, been able to control its borders and report moderate success in the copper theft fight?

C. THE PROGRESSIVE APPROACH—FRANCE

A comprehensive review of the French model reveals success in three of the four metrics. France, as opposed to Italy, has worked diligently with its law enforcement elements and the European Union to combat cross border theft operations. Combined with strong regulatory enhancements, France was able to report moderate success reducing copper theft at the start of the second decade of the twenty-first century. A closer analysis of France's efforts demonstrates how it was able to reduce cross border operations while also reducing the amount of internal thefts from critical infrastructure components throughout the country.

France's initial efforts to stem the flow of illegal copper by setting a monetary cap of \$600.00 for cash transactions in 2010 did little to reduce incidents in the country. In 2010, following the passage of the legislation, the Gendarmerie and the National Police recorded a total of 11,564 incidents of metal theft throughout the country.¹⁹⁷ Data recorded by the French Home Office showed that the amount of copper brought into French scrap dealers decreased by approximately 30 percent following the 2010 legislation, but there is no evidence to show a reduction in the amount of reported theft incidents.¹⁹⁸

Instead of dealing directly with the newly regulated scrap industry and risk arrest, thieves in France merely took their stolen scrap across the border to cash friendly countries, such as Germany and Holland, to receive payment for their stolen items. Therefore, the legislation was ineffective at reducing the overall amount of theft plaguing the nation. Data collected by the intelligence apparatus of the Gendarmerie in 2010 found that nearly 27.2 percent of those charged with copper theft in France were foreign nationals.¹⁹⁹

¹⁹⁷ Valerie Bonvoisin, "Theft of Metals in Metropolitan France in 2010," *Focus: Statistic Notes from the French National Supervisory Body on Crime and Punishment* 7 (2012): 4, http://www.inhesj.fr/documents/files/ondrp/in_english/focus_7_en.pdf.

¹⁹⁸ "Tackling Metal Theft: Prohibit Cash Payments and Higher Fines." Home Office, 2012, accessed November 5, 2015, <https://www.justice.gov.uk/downloads/legislation/bills-acts/legal-aid-sentencing/laspo-metal-theft-ia.pdf>.

¹⁹⁹ Bonvoisin, "Theft of Metals in Metropolitan France in 2010," 4.

When France pushed forward with additional legislation banning all cash payments in 2012, it was able to significantly reduce the number of reported copper theft incidents throughout the country. The Gendarmerie, as referenced in the case study, noted a significant reduction in theft incidents in 2012 compared to 2011. Based on the aforementioned figures regarding the demographics of copper thieves in France, it is safe to assume that cross-border theft likely still occurred after the cash ban. However, France was able to virtually eliminate the ability of copper thieves to receive payment for stolen items without having to make the costly cross border trips, which cut down significantly on the profitability of the criminal enterprise.

Therefore, the primary difference between France and Italy is the ability of the French government to eradicate problems within its own borders by increasing the regulation of the scrap recycling industry. By eliminating the problem within their own borders, the French were able to dedicate their considerable law enforcement assets to international operations designed to stop organized crime elements from entering their country to steal copper. The criminal justice enterprise in France changed from an effort focused on local thieves and local enforcement to a strategy of national enforcement combined with international efforts, such as Interpol and Railpol.

Ultimately, France achieved the measurable success that eluded Italy by successfully passing strict regulatory enforcement measures, redirecting law enforcement efforts to combating cross border thefts, and expanding penalties for individuals and scrap dealers that violate the enhanced regulatory measures regulating the scrap copper trade.

D. PUTTING IT ALL TOGETHER—THE UNITED KINGDOM

France's efforts to curb copper wire theft served as a platform for the United Kingdom, which heavily emulated France's approach while adding additional measures that ultimately led to the largest recorded reductions in copper theft among the three case studies. The United Kingdom, through the extensive work of its Home Office, studied the successes and failures of other nations before undertaking a comprehensive plan to attack

copper wire theft within its borders. The United Kingdom case study revealed that the nation succeeded in achieving measurable success in three of the four design metrics.

First, the law enforcement strategy within the United Kingdom towards copper theft changed significantly over time and can now realistically be displayed as a model for all other nations confronting the copper theft epidemic. In the early stages of the fight various police forces within the United Kingdom attempted to attack the problem at a local level, using a variety of traditional law enforcement methods typically associated with larceny. As noted in the case study, those efforts were generally successful in localized areas but did little to reduce the overall level of theft incidents within the nation. Furthermore, no one law enforcement entity was tasked with being the lead agency, which would have ensured better intelligence gathering, data collection, and analysis.

Learning from its mistakes, the United Kingdom created a national metal theft task force, and designated the British Transport Police (BTP) as the lead agency.²⁰⁰ The United Kingdom enacted a wholesale change in the law enforcement enterprise related to copper theft within their nation. The overall national task force resulted in enhanced cooperation between agencies and ultimately led to better detection of theft incidents, serving as a catalyst in the overall reduction of copper theft incidents in the nation.²⁰¹ Neither Italy, which suffered from a well-documented, historic feud between national police agencies, nor France, with its separation of authority and duties between the Gendamerie and the National Police, were able to achieve to achieve the sustained level of law enforcement cooperation that the United Kingdom has with its BTP-led national task force.

Second, the United Kingdom successfully passed the strictest regulation possible on the scrap recycling industry, the total ban of all cash transactions for scrap metal as well as a legal requirement to maintain identification information on all sellers. The United Kingdom passed legislation after other nations, such as France and Belgium,

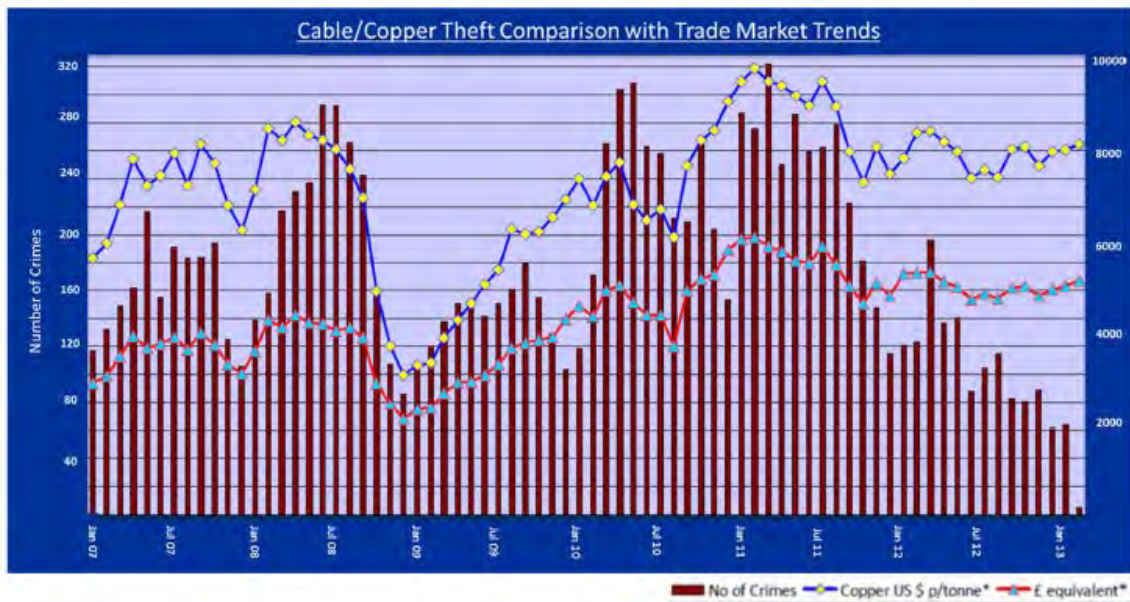
²⁰⁰ “UK Task Force to Target Metal Theft,” *Recycling International*, December 5, 2011, accessed October 3, 2015, <http://www.recyclinginternational.com/recycling-news/5904/non-ferrous-metals/united-kingdom/uk-task-force-target-metal-theft>.

²⁰¹ Francavilla, “Forces to Keep Metal Theft Teams after Taskforce Ends.”

forged ahead with cash bans. After other nations successfully banned cash transactions the United Kingdom did initially fall victim to a new phenomenon, called “theft tourism,” whereby organized crime groups entering the country to continue their copper theft operations.²⁰² In that respect, the United Kingdom’s problems were similar to the issues currently faced by Italy, which lagged behind other nations in the strengthening of regulatory measures.

After the cash ban, the United Kingdom reported a significant statistical drop in the amount of copper thefts inside the country. By any statistical measurement, the United Kingdom’s efforts resulted in success. Figure 7, published by the U. K. Power Networks, demonstrably shows the significant decrease in metal thefts between January of 2011 and January of 2013. Most surprisingly, the decrease in thefts occurs despite the overall stagnation of the price of copper on the world market, showing that the United Kingdom’s successes occurred independently from the copper price index.

Figure 7. Cable/Copper Theft Comparison with Market Trends



Source: *Metal Theft Focus Group* [PowerPoint], UK Power Networks, February 28, 2013, accessed October 1, 2015, https://www.ukpowernetworks.co.uk/Internet/en/have-your-say/documents/Metal_theft_slide_deck_28Feb2013.pdf.

²⁰² Parry, “Out-dated Scrap Metal Laws Blamed,” 39.

Replicating the success of the United Kingdom may be difficult in the United States due to the vast size of the country and the distinct laws governing the scrap metal industry in each of the 50 states. In 2015, Louisiana became the first state to pass a law banning cash transactions on all second hand items, including scrap metal and copper.²⁰³The Louisiana law lacks the enhanced regulation of scrap dealers present in the United Kingdom and the requirement to keep comprehensive identification records of all sellers.

Aside from legislative efforts, there have been many enhanced and targeted law enforcement activities in the United States reminiscent of Operation Fragment and other earlier efforts in the United Kingdom. Each of the activities tried in the United States has lacked the regulatory enhancements of Operation Tornado. In order to replicate the success of the United Kingdom, the United States will have to explore a comprehensive, cross-state, regulatory, and enforcement proposal to tackle the rising copper theft problem.

Comparing efforts in the United States to the three case study nations is necessary to determine which of the measures and programs may be adaptable to the copper theft strategy within the United States. Unfortunately, to date, the United States has not implemented any comprehensive copper theft strategy and its efforts as a nation lag behind those of even Italy.

E. APPLICATION OF CASE STUDIES TO UNITED STATES POLICY

A careful review of the three case studies reveals that many of the programs and initiatives implemented in the United Kingdom, France, and Italy have been either attempted, or proposed, in the United State in various forms at the state and local levels. However, no law enforcement program, legislation, or enhanced regulatory efforts have been successfully implemented at the national level. In that respect, the approach taken by the United States closely mirrors the approach taken by the Italians, whose efforts the case study analysis demonstrates have not been successful on any level over the past 10

²⁰³ Joseph Salerno, "Forcing Cajuns to Go Cashless," *Mises Wire* [blog], April 13, 2015, accessed September 5, 2015, <https://mises.org/blog/forcing-cajuns-go-cashless>.

years. An analysis of the United States' efforts within the four research metrics clearly demonstrates the overall failure of efforts within the United States.

The first measurement used to evaluate the case study nations was an evaluation of their efforts to enhance regulation of the scrap recycling industry. While France and the United Kingdom both greatly enhanced regulation of the industry Italy did not. The United States, like Italy, has done nothing to enhance nationwide regulation of the scrap industry. Various states, such as the aforementioned example in Louisiana, have attempted to enhance statewide regulation. A study prepared by the Institute of Scrap Recycling Industries (ISRI), one of the primary stakeholders in the metal theft fight in the United States, found that all 50 states in the country had passed various forms of legislation aimed at increasing regulation of the scrap recycling industry within the past 10 years.²⁰⁴

The legislation, as noted by ISRI, lacks uniformity and as a result, enterprising metal thieves merely take their stolen products out of states with heavy regulation to those states that lack any regulatory measures. In that respect, the problems faced within the United States are very similar to Italy as criminals merely cross borders to find areas with lax regulations willing to pay cash for scrap with minimal licensing requirements. There are a variety of anecdotal media reports that strongly suggest that the enhancement of state level regulations has been an abject failure. In Texas, for instance, a law passed in 2008 forced scrap dealers to collect verifiable identification from sellers, as well as holding all purchased items for three days prior to repurposing it.²⁰⁵ In spite of the passage of that law, copper theft incidents continued to be a problem throughout Texas, so much so that in 2015, the Sheriff's Association of Texas proposed new legislation that would restrict all cash transactions for copper theft in the state and require each seller to be fingerprinted at the point of sale.²⁰⁶

²⁰⁴ "State Metal Theft Statutes," Institute of Scrap Recycling Industries.

²⁰⁵ Troy Anderson, "The Other Side of the Penny: Scrap Dealers' Opinion on Thefts," *NBIZ Magazine*, spring 2008, 20–22, <https://www.nbizmag.com/magarticles/scrapdealersopiniononthefths.pdf>.

²⁰⁶ Laura Nicholes, "Texas Sheriffs Urge Passage of Metal Theft Legislation," Texas Association of Counties," March 20, 2015, <http://www.county.org/Legislative/news/Pages/County%20Issues%2003-20-15/Metal-Theft-Recycling.aspx>.

Aside from state level efforts, efforts to pass enhanced scrap recycling regulation have failed miserably at the federal level, which has resulted in the wide variety of state level solutions that do not address the overall national problem. The first real national effort pushed forward in the U. S. Congress was the Copper Theft Prevention Act of 2008, which required scrap recyclers to document all transactions as well as imposing civil penalties for those dealers that violate the law.²⁰⁷ The 2008 act never made it to the floor of either the House of Representatives or the Senate for a vote.

As copper theft incidents continued to rise in the United States, a new measure was proposed in Congress called the Metal Theft Prevention Act of 2013.²⁰⁸ The act, entered onto the congressional calendar as Senate Bill S. 394 and House of Representatives Bill H. R. 867, specified that all cash transactions for scrap metal in the United States would be limited to a total of \$100. It also included the implementation of other measures such as identification requirements and strong civil penalties for those entities found to be in violation of the new law.²⁰⁹ The bills ran into heavy opposition in Congress, particularly from Republicans that argued the measures imposed undue federal burdens on the states while violating the Commerce Clause of the constitution.²¹⁰ The bills also ran into resistance from ISRI, various state level attorney generals and states' rights advocacy groups.²¹¹ As a result of opposition the House bill never made it out of its committee, while the Senate bill never received a full vote. At various times over the past eight years, the Metal Theft Prevention Act, in various forms, has been proposed but never enacted, resulting in a total lack of federal guidance for states attempting to combat the copper theft problem in the United States.

²⁰⁷ "Position Paper: Copper Theft Prevention Act," American Supply Association, accessed October 13, 2015, http://www.bipac.net/asa/copper_theft_prevention_act.pdf.

²⁰⁸ "H. R. 867—113th Congress (2013–2014): Metal Theft Prevention Act of 2013," accessed October 6, 2015, <https://www.govtrack.us/congress/bills/113/s394>.

²⁰⁹ *Ibid.*, 1.

²¹⁰ "Lee Opposes the Metal Theft Prevention Act," press release, June 13, 2013, Mike Lee, United States Senator for Utah, June 13, 2013, accessed October 10, 2015, <http://www.lee.senate.gov/public/index.cfm/press-releases?ID=7fec517d-6a09-48f4-9c2e-bc735916898c>.

²¹¹ "The Right Approach to Legislating Metals Theft," *ISRI Blog*, September 1, 2015, Institute of Scrap Recycling Industries, September 1, 2015, accessed October 8, 2015, <http://www.isri.org/news-publications/isri-blog/isri-blog/2015/09/01/the-right-approach-to-legislating-metals-theft#.Vl2FPnarRaQ>.

Like France and the United Kingdom, the United States has also failed to achieve any success within the second measurable metric of this research project, which evaluates the effective imposition of legal changes that levy enhanced criminal sanctions on copper thieves. To date the U. S. Congress has neither proposed, nor enacted, any legislation amending the federal code to provide for enhanced penalties for those convicted of copper wire theft.

The closest the federal government has come to considering enhanced criminal legislation was an amendment to the Metal Theft Prevention Act that would have imposed “10-year prison sentence on anyone caught stealing metal from telephone or cell towers, highway equipment or other critical infrastructure.”²¹² Various states have enacted enhancements for penalties related to copper theft, but the inability to federalize the crime has ultimately led to a situation very similar to that in Italy where crimes are prosecuted and penalized differently depending on the region of the country.

The United States would also score very poorly on the third metric, which measures changes in criminal justice strategy. While copper theft within the United States has been prevalent in media headlines and been discussed in a variety of law enforcement forums, such as the Police Executive Research Forum and the International Association of Chiefs of Police, to date no coordinated federal strategy has been proposed or developed within the nation. Instead, the United States relies on a local approach to combat the crime, very similar to the early efforts within the United Kingdom. Rather than focus efforts on a broad task force that has far-reaching powers, the United States instead relies on law enforcement strategies at the state and local levels.

An example of a successful regional effort in the United States is the Southeast Metal Theft Task Force, comprised of large law enforcement agencies such as the Atlanta Police Department, the Birmingham Police Department, various sheriff departments in the Georgia and Alabama region, local prosecutors, and various scrap recycling

²¹² Stephen Dinan, “Senate Moving to Make Copper Theft a Federal Crime,” *Washington Times*, June 11, 2013, <http://www.washingtontimes.com/news/2013/jun/11/senate-moving-make-copper-theft-federal-crime/>.

businesses.²¹³ The task force is very similar in nature to the approach taken in Somerset, England with Operation Fragment, which was highlighted in the case study. While the approach produced significant arrests it did little to curb the number of theft incidents. Similarly, the Southeast Metal Task Force has failed to produce any data demonstrating a decline in copper theft incidents independent of the copper commodity price index.

All three countries highlighted in the case study changed their criminal justice strategy in some respect, whether creating a national task force or developing a theft monitoring system. The United States has continued to rely on local solutions and local arrests to combat a problem that is clearly international in nature. The inability to establish a national task force has prohibited law enforcement elements in the United States from cooperating with international groups and developing best practices that mirror successful anti-theft initiatives, such as those undertaken in the United Kingdom.

On the final metric, which rated measured reductions in copper theft incidents, it would be difficult to accurately rate the United States due to the lack of statistical data specifically related to copper theft. By failing to designate an organization to maintain statistical data, as has been done in the United Kingdom with the British Transport Police and in France with the Gendarmerie, the United States has lacked the ability to accurately determine the specific rate of copper theft incidents that occur throughout the nation. Anecdotal evidence supplied by the National Insurance Crime Bureau at the end of calendar year 2013 noted a decline in insurance claims related to copper theft between 2011 and 2013.²¹⁴ The report does not note a reason for the decline in insurance claims; however, a review of copper prices over the past five years in the Figure 8 (provided by Kitco Metals) demonstrates that the price of copper on the open market has been steadily declining, possibly accounting for the corresponding drop in reported incidents in the United States,

²¹³ “Southeast Metal Theft Task Force: Affiliates,” Southeast Metal Theft Task Force, accessed October 14, 2015, <http://southeastmetalthefttaskforce.com/affiliates/>.

²¹⁴ “Insured Metal Theft Claims See Three-Year Decline,” National Insurance Crime Bureau.

Figure 8. Five Year Copper Spot



Source: “Spot Copper Historical Charts and Graphs, Copper Charts, Industrial Metals,” Kitco, accessed October 31, 2015, http://www.kitcometals.com/charts/copper_historical_large.html.

Without definitive statistical evidence to show that United States’ efforts have been successful at reducing copper theft independent of the commodity price index, there is no way to empirically prove that any of the approaches taken within the United States have been successful in any manner. Instead, it appears that theft incidents rise and fall with the commodity price index, which indicates that when the demand for copper increases in the future, the United States will likely again be victimized at unacceptable levels by copper thieves.

F. CONCLUSION

The analysis undertaken in this section clearly demonstrates that the United Kingdom and France have both achieved success in the fight against copper theft, albeit with different levels of success. Italy, which has attempted very few initiatives, has not achieved any measure of success and its efforts failed in nearly every metric of the research design. Unfortunately, the efforts undertaken by the United States to date most

closely mirror those of Italy. In fact, the United States has actually done less at a national level than Italy has.

Replicating the success of France and the United Kingdom will be difficult in the United States, however, due to a wide variety of impediments. To replicate the successful measures undertaken by the United Kingdom, there are a significant number of hurdles to overcome. Much of the success in the United Kingdom is a result of the nation's ability to designate the British Transport Police as the lead law enforcement agency responsible for all copper theft operations and intelligence. The British Transport Police is a national police organization with jurisdiction throughout the nation, and there simply is no counterpart in the United States that possesses such broad power. In the most recent census related to law enforcement in the United States, it was found that there are approximately 17,895 state and local law enforcement agencies.²¹⁵ In order to coordinate the efforts of those agencies and the various other federal agencies operating within the country, significant legislative action and policy changes would have to be undertaken by the federal government.

Federal regulation of the scrap recycling industry, replicating measures implemented in the United Kingdom and France, also faces significant hurdles in the United States, as evidenced by the inability of Congress to even consider a vote on the various iterations of the Metal Theft Prevention Acts that have been proposed over the past seven years. Regulation of the scrap industry has typically been left to the discretion of individual states and municipalities, and the nationalization of the process in the United States would constitute a significant change requiring congressional approval. Successful passage of nationalized regulation would also likely result in a lawsuit from various state attorney generals who continually seek to check the power wielded by the federal government.

Regardless of the various impediments to change within the United States, it is clear that in order to develop a successful anti-copper theft program that protects critical

²¹⁵ "U. S. State and Local Law Enforcement Agencies Census 2008: A BJS Report, Alaska Justice Forum, 2011, accessed November 3, 2015, http://justice.uaa.alaska.edu/forum/28/2-3summerfall2011/f_lawenf_census.html.

infrastructure, a comprehensive plan must be developed based on the lessons learned from United Kingdom, Italy, and France. While each program and initiative cannot be identically replicated within the United States, there are policies and initiatives that should be considered that may ultimately succeed in the overall reduction of reported copper wire theft incidents throughout the country.

VII. CONCLUSION AND RECOMMENDATIONS

A. INTRODUCTION

The evidence presented in this research study clearly demonstrates that incidents of copper theft pose a significant danger to critical infrastructure facilities within the United States, and as a result, they pose a significant danger to the overall security of the homeland. Efforts have been undertaken in a variety of other nations throughout the world to attack the copper theft epidemic with mixed results. Based on the evidence presented within this study, the United States needs to take a new approach in the fight against copper theft by learning from the successes and failures undertaken by the three research subject nations: the United Kingdom, France, and Italy.

The concluding chapter of this project includes a brief overview of the limitations of the research reviewed, recommendations for future research, and recommendations for changes within the relevant policies and criminal justice programs within the United States. The failure to adopt new policies within the United States will ultimately allow the copper theft epidemic to continue unabated.

B. LIMITATIONS

Although the research in this project clearly defines a path to follow in the fight against copper theft, there are a number of limitations within the design process that merit further examination. Those limitations include the scope of the project, the availability of relevant data, and the Euro-centric design of the study. Each of the limitations must be considered when making an overall recommendation regarding future path of policy within the United States.

The scope of the project is the first limitation that must be considered. Due to the complexity of obtaining research from foreign nations, only three nations were chosen for the study. Copper theft is a worldwide phenomenon that has an effect on nearly every nation around the globe, regardless of the size of the nation or its economic prowess. While the results of each case study provide a meaningful sample of three different approaches to the copper theft epidemic, consideration must be given to the fact that

other nations may have very different approaches that may have also successfully led to a decrease in reported copper theft incidents.

Aside from the limitations in scope, the availability of data related to the copper theft problem was also a significant impediment and limitation in the research design. As noted often throughout this research study, each nation sampled was found to use a variety of different methods to track copper theft incidents within their borders. Of the three nations sampled, only the United Kingdom formally designated a single government entity to collect relevant data related to copper and metal theft. Without formal data, the research results within France and Italy were limited to anecdotal media accounts, sample one time reports from a variety of government sources, data from industry sources, and information obtained through insurance agencies. The lack of formal regulated data from verifiable government sources limited the ability to verify the accuracy of the reported open source data.

The final limitation of the study is related specifically to the Euro-centric design of the research. The three nations sampled for the case study were all in Europe and all in relative close proximity to each other geographically. As a result, the research was limited to one small section of the world that has been adversely affected by copper theft. It is certainly possible that the results of the study may have been very different had a sampling been undertaken from disparate nations located around the globe. The lack of available research data and the time limitations of this project made such a sampling impractical. In order to build upon this project, future research must account for the limitations of this study.

C. RECOMMENDATIONS FOR FUTURE RESEARCH

In light of the various limitations related to this research, there are a number of recommendations for any future research projects related to the copper theft epidemic. Future research projects may be able to mitigate or eliminate the various issues that were confronted during the course of this project. Therefore, to successfully examine the copper theft epidemic in the future, a variety of methods should be undertaken.

First, care must be given to expand the scope of any future research. Research must be obtained from more locations and nations in order to explore the wide variety of initiatives and alternatives have likely been explored by nations outside the scope of the current research. Rather than limiting the design of future studies to a small number of nations, care must be given to exploring disparate nations in a wide variety of locations.

Second, in order to account for the lack of verifiable data from government sources related to the copper theft problem, researchers should design metrics that include a wide variety of sources. Media accounts of copper theft are prevalent throughout the world. Future research should include metrics that catalogue and analyze media reported incidents. Furthermore, research must also include metrics that analyze reported insurance claims from each of the case study nations that are selected.

Finally, future research must account for the considerable influence that the copper-theft commodity price index has over the illicit copper trade. Statistics and data within the current project suggest that the commodity price index can greatly influence statistics related to copper theft incidents. Only with a comprehensive examination of the copper theft price index can a strong recommendation be made to design policies that will be successfully independent of fluctuations in the commodity price.

D. RECOMMENDATIONS FOR THE UNITED STATES

A careful examination of the results of the case studies, combined with an examination of current policy in the United States, has led to a variety of recommendations. The United States must take unilateral national action in the fight against the copper theft epidemic. To continue on its current path, the United States ultimately risks continued economic hardship and immeasurable risk to the critical infrastructure components located throughout the nation. In order to mitigate the future effects of copper theft, policymakers within the United States should consider the measures outlined in the next sections:

1. Establish a Centralized Metal Theft Monitoring Center

The United States' approach to date, as evidenced by the case study analysis, has been most similar to the Italian approach. Neither nation has undertaken any meaningful nationwide initiative that has had any impact on reducing the overall number of reported copper theft incidents; however, Italy did successfully create the National Theft Monitoring Centre. While the creation of the center has not been proven to have had any meaningful impact on the reduction of copper theft in Italy, it has allowed the nation to better understand the extent of the problem within its borders.

The United States does not currently have a formal mechanism to record copper theft incidents or to coordinate the various law enforcement effort that are underway at the state and local levels. Various entities, including the Institute for Scrap Recycling Industries (ISRI), have developed mechanisms to record theft incidents. The ISRI platform, known as ScrapTheftAlert.com, encourages various industries and law enforcement entities to input copper theft incidents and specific identifying information for stolen products into an online database for tracking purposes.²¹⁶ As the platform is operated by a private industry advocate, submission of incident data to the platform is purely voluntary and does not present an accurate snapshot of the extent of the theft problem.

Industry resources, such as ISRI, and the various other industrial advocacy associations throughout the United States (including the American Association of Railroads, the American Public Power Association, and various others) should be included in the planning and ultimate operation of any national monitoring center. The creation of a theft monitoring center without the input and financial resources of the industrial stakeholders would likely result in failure.

Legislation calling for the creation of a monitoring center must include language that compels the various law enforcement agencies of the United States to report confirmed incidents of copper theft to the center. In that respect, the center should

²¹⁶ "Home," ScrapTheftAlert, accessed November 6, 2015, <http://www.scraptheftalert.com/Home/Home.aspx>.

function in a manner similar to the National Crime Information Center (NCIC), which allows law enforcement user agencies to input and retrieve information on a variety of crimes.²¹⁷ NCIC is not the only precedent in the United States for creating a national center dedicated to a specific area of criminality.

Congress has also authorized the creation of the National Center for Missing and Exploited Children and the National Sex Offender Database. Each program is national in scope and receives direct input from federal, state, and local agencies to advance their missions. The creation of a National Metal Theft Monitoring Center would not be an easy process but would be absolutely integral in the fight against metal theft nationwide, especially if the United States continues to be unsuccessful at passing meaningful regulatory legislation related to the scrap recycling industry.

2. Reintroduce Comprehensive Regulatory Legislation

The United States has consistently failed to pass regulatory measures aimed at controlling the scrap recycling industry on a national level. As a result, copper theft incidents continue to occur throughout the United States. The efforts of the United Kingdom have shown that comprehensive regulation, including the abolishment of cash transactions for scrap metal and enhanced transaction tracking capabilities, have a significant impact on the illicit copper trade. Nefarious actors are prohibited from exchanging stolen products for quick cash in the United Kingdom, and as a result, the number of reported incidents has drastically decreased since the enactment of the measure.

There are numerous hurdles that will have to be overcome within the United States in order to enact national legislation, not the least of which is the strong objection of the states' rights wing of the Republican Party that believes a national regulation is a violation of the Constitution. Many of those politicians believe that states are better equipped to handle the problem. Statistics clearly have shown, however, that is not an accurate assumption and that a national solution is needed.

²¹⁷ "National Crime Information Center," Federal Bureau of Investigation, March 17, 2010, accessed November 3, 2015, <https://www.fbi.gov/about-us/cjis/ncic>.

Various iterations of the National Metal Theft Prevention Act have been proposed over the past eight years. To date the bill has not received a vote in Congress. If the United States is serious about confronting the copper theft crisis, it must be willing to consider a national solution. Otherwise results will continue to mirror those in Italy, where theft is rampant in various regions throughout the country.

3. Creation of Federal Penalties for Copper Wire Theft

Any meaningful legislation must include enhanced criminal penalties for copper wire theft. While various states have enacted criminal enhancements for copper theft offenses, an offense category is needed at the federal level to protect the various forms of critical infrastructure located throughout the nation.

Federal penalties should be created for any offense deemed to have occurred at a facility designated as part of the national critical infrastructure. Those facilities, as noted by the Department of Homeland Security, are those facilities that are vital to the nation's physical and economic security. Any thief caught stealing from any facility deemed to be critical infrastructure should face federal criminal charges and federal prison time. The creation of a federal penalty would likely serve as a significant deterrent to potential copper thieves throughout the United States.

4. Designate a Primary Law Enforcement Agency

The United Kingdom is the most successful nation analyzed in the case studies primarily because all law enforcement operations related to copper theft within its nation were centralized under one authority, the British Transport Police. While all agencies within the nation continue to participate in the enforcement of laws and as members of various task forces, the BTP has the primary responsibility for the management of operations and the enforcement of regulations related to the copper theft trade.

The United States should replicate the success of the United Kingdom by designating a single federal agency as the sole agency responsible for copper theft operations. The agency should be a central clearinghouse for all copper theft statistics as well as the primary organizer for all task force operations throughout the country.

Whatever agency that is designated must have a clear mandate to enforce regulations related to the scrap recycling industry as well as statutory authority to operate within all 50 states. There are a number of federal agencies that have the capability of national operations, including the Department of Commerce, the Department of Treasury, and the Federal Bureau of Investigation.

5. Increase Cooperation with Canada and Mexico

Policymakers in the United States must be mindful that any new set of regulations or laws within the United States that govern the scrap recycling industry must be enacted in accordance with similar laws and initiatives within Canada and Mexico. To curb the copper theft epidemic successfully, policymakers must be willing to work with the governments of those two bordering nations. Failure to do so may result in a situation that mirrors that of Italy.

This thesis has demonstrated that one of the primary catalysts for the failure of the Italian efforts has been the proliferation of cross border smuggling operations that originate in countries bordering Italy. Should the United States implement new regulatory measures but fail to work with Canada and Mexico, it is likely that cross border smuggling operations similar to those in Europe may begin to appear in North America.

E. CONCLUSION

Ultimately, this research project set out to determine best practices to guide the United States in the fight against the copper theft epidemic. The efforts and initiatives related to copper theft that were undertaken in the United Kingdom, France, and Italy were examined in order to determine if any of the three nations had found any success in reducing the number of reported copper theft incidents within their respective borders. Following careful examination of each case study, a number of conclusions as a result of this research project.

First and foremost, the failure to take action on a national level will allow the copper theft epidemic to continue in perpetuity. The cases of the United Kingdom and France have proven that a measurable reduction in copper theft incidents can be had if a national system of regulatory measures is implemented with respect to the scrap recycling

industry. Italy has failed to achieve any measurable success in the copper theft fight, primarily because of its inability to develop a comprehensive national regulatory solution. The current lack of policy within the United States closely mirrors that of Italy and is a primary reason why copper theft continues to be an issue in all 50 states.

Second, law enforcement strategies have proven to be far more successful when directed by a single component, such as the British Transport Police. While enhanced regulation of the scrap recycling industry accounted for the majority of the reduction in reported incidents in the United Kingdom, without the consolidation of law enforcement efforts, it is likely that its level of success in the copper theft fight would not have been nearly as high. The United States and Italy have failed to combine efforts of law enforcement under one unifying umbrella, resulting in a scattered approach, heavily reliant on local initiatives. The lack of a national law enforcement strategy has crippled both the efforts of both nations.

Finally, the nations that have had the most success in the copper theft fight are those nations that have developed comprehensive approaches involving increased regulation, enhanced criminal penalties, unified law enforcement strategy, and the engagement of a variety of stakeholders. The copper theft epidemic is a complicated problem that requires a complicated solution. Simply enacting one initiative, such as the National Monitoring Centre in Italy, is not enough to eradicate the problem. Policymakers must be willing to attack the problem in a variety of ways in order to achieve any measurable amount of success.

The path to success has been paved by the forward thinking nations of the United Kingdom and France. In order to protect the United States homeland effectively from enterprising copper thieves, a coordinated and comprehensive strategy, including enhanced regulation of the scrap recycling industry, increased criminal penalties, and the designation of a primary law enforcement agency, are absolute necessities. Any solution that does not incorporate those initiatives will likely fail, and as a result, copper theft will continue to pose a significant problem for critical infrastructure components throughout the United States.

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