



Trinity College Dublin
Coláiste na Tríonóide, Baile Átha Cliath
The University of Dublin

Elemental Principles: How the European Union and United Kingdom are Dealing with Critical Raw Material Supply Chain Issues and the Public Perception of Mining, a Reflection on Leadership in Action

Meabh Ní hÉalaithe

Supervisors: Mark Patton, Dr. Mark Cooper, Dr. Michael Stock

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Introduction

The goal of this project was to report on the different ways the UK and EU are securing the supply of Critical Raw Materials to achieve sustainable development goals, and to investigate the public perception of mining for these materials. A report is currently being written up for this, and a presentation was made to the Geological Survey of Northern Ireland (GSNI). It is partly a continuation of my Summer 1 research, where I investigated the potential mechanisms for the mineralisation of platinum group elements in the Carlingford Igneous Complex. I wanted to learn about how scientific research can affect policy, and how and why the policies are enforced. Another aspect I wanted to investigate is the public's perception of mining, following an altercation with a local farmer during my fieldwork in Summer 1.

'If it hasn't been grown, it's been mined', is a phrase becoming more widespread in recent years as the green energy transition and consequently mineral resources have come to the forefront of our attention. Raw materials are needed for almost all parts of modern-day life, from smartphones to coffee machines, from bicycles to the buildings we live and work in, and roads we drive on to get to them. There are few people that do not avail of anything produced from raw materials. To obtain these raw materials, they must be retrieved from their deposits and then processed for their various uses.

I spent six weeks in the GSNI learning about the intricacies of policy and the fragile nature of public relations with mining. I wanted to learn how mining is perceived by local communities and why it is most usually negative. Getting first hand information from communities was not possible at the time due to tensions arising around the planning inquiry for the Curraghinalt goldmine in Greencastle, Co. Tyrone, as a workaround I looked at public perception through news articles, social media pages, and anti-mining websites. This allowed me to look at perceptions not only in Northern Ireland, but across the EU and UK. My hope for this report and presentation are to understand why people are against mining, and to bridge the information gap between mining companies and government, and the wider public.

EU and UK Policies

For the policy aspect of my LiA I mostly studied the 2024 EU Critical Raw Materials Act¹ and the UK Vision 2035 Critical Minerals Strategy². I also looked at related legislation material including the UK Industrial Strategy, the EU Net Zero Industry Act, the EU Green Deal Industry Plan. I compared the way the EU and UK are dealing with Critical Raw Material (CRM) supply chain instabilities from both geopolitical and demand aspects.

EU CRMA	UK Vision 2035
2030 target	2035 target
10% domestic production	10% domestic production
25% recycling	20% recycling
<65% supply from any one country outside EU	<60% supply from any one country outside UK
Focus on security, domestic production, and circularity	Focus on economic growth, midstream processing, and resilience

Table 1. EU CRMA and UK Vision 2035 goals.

The EU is focusing more on independent production of CRMs by mandating Member States to investigate their mineral potential. If a significant deposit of CRM is found it may be granted Strategic status and avail of accelerated permitting, though must still meet all EU environmental social governance demands to be approved. The EU CRMA is a legally binding framework that must be followed by all Member States, though the benchmarks are not strict and failure to meet them will not be penalised. The UK Vision 2035 is more of an incentive for future investors. The UK is limited in its mineral potential simply due to it's geography and footprint. It must therefore diversify and develop its midstream processing abilities as well as recycling capabilities. These all also fall under research and development, in which the UK is extremely strong. The targets of both pieces of policy are broadly similar, with emphasis being put on reducing reliance on other countries for supply and production of raw materials.

Both the EU and UK developed lists of Critical Raw Materials and Critical Minerals respectively. Subsets of these were also developed by both; the EU has a list of Strategic Raw Materials (SRMs) as well as Conflict Minerals, the UK has a list of Growth Minerals. Critical Raw Materials are deemed by the EU Commission as raw materials that are most important

economically and have a high supply risk. Strategic raw materials are defined by the European Commission as those that are most crucial to the EU for a green and digital transition, and for aerospace and defence. UK Critical Minerals are defined by evidence of their supply risks and future demands. Growth minerals in the UK are defined as materials which are vital for the UK's Industrial Strategy due to high expected demand or lack of substitutes (GOV.UK).

Shared Critical Status	UK Only	EU Only
<i>Aluminium/Bauxite</i>	Indium	Arsenic
Antimony	Iridium	Baryte
<i>Bismuth</i>	Iron	Beryllium
<i>Boron/Borate</i>	Magnesite	Coking Coal
<i>Cobalt</i>	Nickel	Feldspar
<i>Gallium</i>	Rhenium	Fluorspar
<i>Germanium</i>	Rhodium	Phosphate Rock
Hafnium	Ruthenium	Scandium
<i>Helium</i>	Sodium	Strontium
<i>Lithium</i>	Tellurium	
<i>Magnesium</i>	Tin	
<i>Manganese</i>	Zinc	
Natural Graphite		
Niobium	Growth Mins	SRM but not CRM
<i>Phosphorus</i>	Chromium	<i>Nickel</i>
<i>PGMs</i>	Copper	<i>Copper</i>
<i>REEs</i>	Uranium	
<i>Silicon Metal</i>	Graphite	
Tantalum		
<i>Titanium Metal</i>		
<i>Tungsten</i>		
Vanadium		<i>Italic = EU SRM</i>

Table 2. List of CRMs, Critical Minerals, SRMs, and Growth Minerals.

Public Perceptions

The tensions in Northern Ireland were quite high with regards to mining during my time there. A very contentious public enquiry was underway to determine whether or not Dalradian Gold was to be granted permission to mine one of the largest gold deposits in Europe in the Sperrin Mountains. It was determined that face to face interactions were not advised. I had to then determine how this could be overcome. I knew I wanted to write up a policy report, but I also wanted to compile something to help with the disparity between local people, and the government and mining companies. Having to take a more hands off approach to looking at public perceptions, I realised I could broaden my research, and garner more opinions through using news articles, social media posts, and anti-mining websites to determine the main drivers against mining. I used four case study mines to gauge what makes a 'good' and 'bad' mine, two from the UK and two from the EU. Kiruna Mine in Sweden, and Miña do Barosso in Portugal were selected as the EU case study mines. Woodsmith Mine in Teesside, and Curraghinalt Mine were selected as the case study mines in the UK. In investigating these case studies, it was determined that there are multiple factors that determine if a mine is received well by the public. The main factors to positive reception are open availability of information on the development of a mine as seen in Woodsmith Mine, and a history of mining within an area as seen in Kiruna Mine. Negative reception is usually due to environmental concerns regarding mine waste disposal as seen in Curraghinalt, and the open-pit nature of some mines including Miña do Barosso.

I decided to compile as much information as possible for both the public and for policy makers. One of the main problems people have with a mine being opened near them is they feel they have no choice, it is an 'us vs. them' mindset that is borne from a lack of information and transparency. The same can be said for policymakers and local government that grant permissions for mines to be built. Locals can be seen as a nuisance, they can delay the planning process for a mine almost indefinitely, and in some cases they can even stop them from being opened altogether as seen in the case of the Rio Tinto owned Jadar lithium mine in Serbia.

I presented my findings and recommendations to the GSNI Science Taskforce, and I am currently writing up a report which includes observations and recommendations on how to improve connection with communities affected by potential and ongoing mining activities for government bodies in both the EU and UK.

Challenges Faced and Leadership Skills Applied and Developed

The leadership aspect of my LiA was definitely a learning curve, this project was my own, I had to call the shots entirely, and for a time I felt quite lost. In my Summer 1 research, I was working with my supervisor and his PhD student. The research was very structured, all of the sample preparation and analysis followed strict guidelines and protocols. My resilience was tested and imposter syndrome reared its head on many occasions.

During my LiA I honed the leadership skills that I had developed throughout my Laidlaw journey. I developed my project management skills, leading my project by myself. I also developed my capacities in regards to collaboration and communication. I knew that this opportunity was going to be what I make of it and I was going to get out of it what I put in. In the first week I had to find my purpose which I initially struggled with. The environment was new to me entirely, I am much more at home in the lab than I am in a policy office. It was difficult at first to find motivation, initially I was not as passionate about policy and social science as I was about scientific research. However, the more reading and research I did, the more I realised I wanted to help bridge the gap between local communities and the mining companies and policy makers who are making decisions.

In planning the structure of my LiA and the report and presentation I wanted to complete during it, my project management skills were developed. Unlike my Summer 1 research, where the planning was focused around when lab equipment was available, making the structure much more rigid, my LiA timeline was up to me entirely. I had to create timelines for myself, and plan around other activities that were happening during my time in Belfast. The independence I developed has been invaluable. I had long struggled with keeping myself accountable and am notorious for procrastinating, my LiA shook me out of this.

Collaboration and Team Dynamics

During my LiA I worked with a team of 14 people. Though my project was my own, I was given opportunities to work with the team and learn from them in their own projects. The knowledge I gained for saying “yes” to every opportunity has been invaluable. I was so lucky to be a part of a team that worked very closely and effectively with one another, the teamwork they showed was inspiring. Everyone was on the same page when it came to getting projects completed, and helped one another out whenever it was needed. I learned through them that communication is essential, a weekly meeting with the entire team let everyone know what

everyone else was doing throughout the week, and an open plan office allowed people to walk to one another's desks for discussion.

I was given the opportunity to take part in some fieldwork, which despite not being part of my LiA still taught me about collaboration, as researchers from multiple institutions were also taking part. Effective communication in the field is paramount, risks must be identified and solutions had to be created to circumvent them. This also tied in with the public aspect of my LiA as we were in an area where the community was divided by the potential opening of the Curraghinalt mine. This was made very clear by the many 'DALRADIAN OUT' signs attached to telephone poles throughout the Co. Tyrone countryside. Care had to be taken when interacting with local people, clear communication that we were simply here in a research capacity and not affiliated with any companies was vital. We were mostly welcomed which was a relief as many other researchers had been met with scepticism before.

Conclusion

During my LiA experience I learned that whether we like it or not, mining is here to stay. With the increase in reliance on CRMs, policy must be made to inform legislation on their ethical and sustainable procurement, taking into account the need for the CRMs and the sensitivities that may arise with their extraction and processing in communities. It is up to governments to apply sound, scientific, environmental, and sociological research when writing and implementing legislation for the opening of mines. The perceived gap between communities and government/mining companies must be bridged through transparency and education. More community outreach must be provided to maintain a level of trust, be that through educational programs, or the provision of a local spokesperson who can act as a go-between for the community and government/mining companies. There will always be juxtaposition in the environmental concerns related to mining. On one hand trying to turn to a more green economy, with technologies that lead us closer to net zero we will inevitably require more mining and local environmental damage with the payoff of improving the environment as a whole and slowing climate change. On the other hand local communities want to avoid damage to their own environment related to mining. Mining toes the line between detrimental and essential. Without it, the green transition is impossible, and reaching net zero emissions even more so. With it local areas are subject to environmental damage and a plethora of other issues. Short term damage will have to be done in order to secure a sustainable future.

During my LiA I came to realise there is not right or wrong side to be on. Though I have my own beliefs on the necessities of mining for a sustainable future, it does not mean that I do not believe in the negative effects mining has on communities. This has taught me that in future there may not be any clear right or wrong answer, some situations are extremely nuanced and as a leader it is my responsibility to be educated on both sides of an argument. Being able to bring both sides together to reach a middle ground is essential, I plan on developing my mediation skills in the future to better be able to face challenges like these and resolve them in an effective and meaningful way.

References

1. Regulation (EU) 2024/1252 of the European Parliament and of the Council of 11 April 2024 establishing a framework for ensuring a secure and sustainable supply of critical raw materials and amending Regulations (EU) No 168/2013, (EU) 2018/858, (EU) 2018/1724 and (EU) 2019/1020
2. <https://www.gov.uk/government/publications/uk-critical-minerals-strategy/vision-2035-critical-minerals-strategy#vision-2035>