Geoscience Policy Division
Department of the Environment, Climate & Communications,
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Via email only to GSPD@decc.gov.ie

15th October 2021

RE: Consultation on the Draft Policy Statement on Mineral Exploration and Mining in Ireland

To whom it may concern,

This letter is submitted on behalf of the Institute of Geologists of Ireland (IGI) in response to the aforementioned consultation. The IGI is the professional body for geoscientists in Ireland with over 300 members working in a range of areas including minerals and exploration, environmental geology, hydrogeology, engineering geology among others. The IGI is a voluntary organisation and a registered charity. The IGI promotes and advances the science of geology and its professional application in Ireland; and ensures that its members uphold, develop and maintain the highest professional standards.

In 2019 the IGI established a Minerals Information Working Group (MIWG) comprising geoscientists from a range of disciplines who have a connection to mineral exploration or mining. In 2021 the MIWG produced a series of information sheets which are available through the IGI's website.

The Draft Policy Statement is welcomed as it sets out the Government's strategy to support a regulated approach to mineral exploration and mining industries. This submission has been prepared by the MIWG and sets out information relating to mineral exploration and the mining industry in Ireland in the context of the draft policy. Should you require any further information please do not hesitate to contact us.

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Summary

Achieving the objective of the European Green Deal will require a significant increase in the production of raw materials. The production of such raw materials requires their discovery via exploration and development in the first instance. Exploration is the cornerstone upon which the minerals sector is built, and Ireland is particularly well-placed to assist the EU in the sourcing of many of these raw materials required for a sustainable responsible economy. Ireland produces more zinc per km^2 than any other country in the world. All of the mines are within in the broader midlands area, where the potential for more discoveries is high. Most importantly, unlike most other industries, mineral deposits can't be moved to another location, they are a function of a lands geology and hence are geolocked to where they were formed.

Given the location of minerals in Ireland, exploration and mining can play a significant role in the Just Transition within the midlands. With Ireland's rigorous planning and environmental regulation and controls combined with just labour laws, minerals from Ireland would be an ethical source for metals for the future. None of the specialty metals required for our needs have been produced historically in the quantities presently being required and forecasted. Thus, they must be found before they can be used and recirculated. Not alone are the specialty metals required for the Just Transition, but the 'traditional' metals such as copper, lead, zinc and silver will be required in even greater quantities for the transmission and storage of electricity and in the production of EVs, media devices, batteries, turbines, computing storage facilities and the many other forms of modern-day electrical and electronic equipment.

Ireland has an opportunity to show the world, how a carbon neutral society can be achieved through proper planning from the basics, that is, minerals exploration through good mining practice to smelting and refining and recycling which can produce environmentally friendly metals such as zinc, lithium and germanium. If we do not seize the opportunity it will pass us by and we will be left behind economically and become indebted to others to provide us with the necessary minerals to maintain our lead in the digital economy.

Introduction

This submission concentrates on three themes:

i) the positive statements within the Policy Document and the role of the two industries in a carbon-neutral economy;

ii) a number of omissions which will add to the debate, for example, the role of SMEs, the knock-on effect and the creation of related manufacturing and service industries and the combined impact on the rural economy, and;

iii) what are the alternatives, especially in regard to out-sourcing?

Background

This Public Consultation process is very much welcomed because it allows the fundamental contribution of mineral exploration to the economy to be examined and presented. In addition, the esteem with which Irish minerals explorationists are held throughout the world and the many other nationalities who have 'learned their trade here' or who are contributing in a major way to the Irish economy are being encouraged to have their say.

Whilst mineral exploration and mining are regularly conflated, in Ireland and in many countries elsewhere throughout the resource producing world, they are seen as two separate industries, and though related to each, they are effectively separate industries and services. Mineral exploration also has one unique distinguishing feature from all other industries, one does not even know if the deposit exists.

After the re-opening of the copper deposit at Avoca in the late 1950s, modern minerals exploration methodologies were introduced into Ireland by a combination of Irish-owned and/or Canadian junior exploration/mining companies, who within a few years, made discoveries that became mines at Tynagh, Co. Galway, Gortdrum, Co. Tipperary and Silvermines, Co. Tipperary. These discoveries led to an upsurge in minerals exploration activity which culminated in the discovery of the Navan zinc-lead deposit by an Irish-owned and operated company. These discoveries were added to by the development of the barytes mine at Ballynoe, Silvermines,

which elevated Ireland into the Top 10 barytes producing countries in the world and the subsequent metalliferous discoveries at Galmoy, Co. Kilkenny and at Lisheen, Co. Tipperary.

What is most noteworthy about all of these discoveries is that they were all made by Irish-owned and operated SMEs. It is remarkable that there has been no discovery of an economic mineral deposit in Ireland by a large international mining company working on its own in Ireland. On the other hand, Irish explorationists working abroad have made a host of discoveries and in addition many non-Irish geologists who trained here went on to make many discoveries abroad. Is it any wonder that Irish geologists seeking work abroad have little difficulty in obtaining employment. The exploration activities themselves created a large number of jobs for geologists, geochemists, geophysicists, drillers, laboratory personnel and field technicians, almost all of whom lived in rural areas. This trend contains to this day.

Except for the first couple of discoveries, all subsequent discoveries eventually ended-up under the control of multi-national mining companies, the principle reason for this being the lack of support by various Irish governments for the Irish owned companies, however all of the new owners have conducted their operations in an exemplary manner under the planning and environmental permissions.

The Navan orebody is the largest zinc orebody in Europe and is within the top five largest zinc orebodies worldwide. 50 years later it is still an active mine, employing, directly and indirectly, over 1,000 people. These modern mines have been estimated to have contributed as much as 5% of GDP at that time and were in fact the first examples of native Irish industry, employing hundreds of workers in rural areas and accelerating the development of local economies. Ireland's zinc-lead production accounts for approximately 11% of European zinc mine output (16.6% of EU27 production) and 3% of European lead mine output (6.4% of EU27 production). According to data published by the International Lead and Zinc Study Group, in 2020, Ireland is currently placed fourth in terms of European mine production for zinc, and is ranked 17th and 27th in the world in relation to zinc and lead mine output respectively. All of this is founded on successful mineral exploration.

Circular Economy

In mentioning the 'circular economy', the policy document correctly points out that recirculation of materials can never be completely achieved. There will still be a massive requirement for metals and minerals for three principal reasons: i) many of the metals required for the Green Economy have not been widely used in the past and therefore new deposits which contain them must be discovered and developed; ii) add to this the unavoidable physical losses during development and production, longer lasting products, and the uneconomic recovery of metals from, for example the re-enforced cement anchors attaching to offshore wind-turbine platforms; iii) unless people are proposing that there should be a decrease in living standards, the only alternative for many in the industrialised world and for most in the developing world is the discovery, development and production of metals from new deposits.

The policy document and presentations make the very important distinction that within the 'Minerals Sector' that there are two distinct industries, the "minerals exploration industry" and the "mining industry". This distinction is very apropos to Ireland and it is a very important distinction because the philosophy and economics under-pinning both are very different, as are the personnel, and the interaction between individuals and the public is also distinctly different.

Mineral Exploration, Sustainable Supply and Renewable Energy

To have a sustainable raw materials supply industry, one needs three things - the potential for discovery, the expertise to make the discoveries and the willingness to develop the new deposits. The World Bank has estimated that world metal production must increase by 150% to achieve the Green Economy. Thus, in order to achieve the Green Economy one needs more mines, not fewer. This requirement is exacerbated by the fact that many of the specialty metals, excepting lithium, required by the renewable alternative energy sector usually occur as trace elements within host metal deposits, mainly base metals, such as copper and zinc deposits. "There is a huge risk that we in Europe end up replacing our import dependency on fossil fuels by one on (non-energy) raw materials", (Šefčovič, 2019). This has been substantiated by the World Bank (2017) who using wind, solar and energy storage batteries as examples, 'forecast a growing demand for the following metals: aluminium, cadmium, cobalt, copper, indium, iron, lead,

lithium, manganese, molybdenum, nickel, platinum group elements, rare earth elements (particularly neodymium), silver, titanium and zinc'. This has been further strengthened by O'Sullivan (2021), who, using data from the International Energy Agency report, highlighted the fact that "a shortage in critical minerals could delay, and make more expensive, transitions to low carbon emission energy and transport systems, (especially in regard to) the supply and demand for minerals and pointing out that an "electric car needs six times more mineral inputs than its conventional equivalent and an offshore wind turbine plant requires nine times more mineral resources than a gas plant".

Following the Agreement for Government, Minister Ryan, when speaking in the Dáil on the nomination of the Taoiseach, said that 'we have to invest in a completely new energy system. It is how we will create a secure economic future, because we will be relying on our own resources. That ambition goes back to the core founding principles of this State of managing our own resources for the benefit of our wealth and security into the future. The energy system we are going to create in this low-carbon world will do exactly that'. This is supported by EC President Ursula von der Leyen (2021) who stated, "98% of the rare earth elements we need come from a single supplier: China. This is not sustainable". This is expanded upon by the EC in its Critical Raw Materials Report (2020), "The EU is between 75% and 100% reliant on imports for most metals" and that 'metal demand will increase by over 150% during the next 40 years'. But most importantly, as Commissioner Šefčovič (2019), stated "I am convinced we in Europe can lead this 'just transition' (i.e. leaving no one behind) to build a 'new sustainable economy for all' ". Later on, he said, "If the European Battery Alliance has taught us one thing it is that top-down approach does not work. We need to understand from the industry, the innovators, the financiers, the people on the ground, what is needed to accelerate this transition, and mitigate its impact".

Ireland's Potential Positive Role

Many people are inclined to equate the non-working of certain metals with the non-existence of those metals and minerals deposits. In fact in most cases, especially in respect of specialty metals and/or "Energy Critical Elements", they have not been looked for, sometimes even

producers have tended to ignore them because they might attract a penalty at the smelter. Hence the recent emphasis on mine waste and mine tailings. On the other hand, the smelters and refineries have been able to extract the specialty element from the concentrate without having to pay the producing mine for it.

Minerals exploration is the high risk end of the metal supply system. Most people are unable to grasp the risk concept and tend to ignore or 'skip' the exploration phase and commence their consideration of the metal supply at the 'mining phase'. This ignores the very basis of a mining venture, one must first discover the deposit. As the IGI (2021) has pointed-out, Ireland can play a major role and benefit from these demands, "Long-term spin-off industries arising from the exploration and mining sector include geochemical laboratories, drilling companies, design, consultancy and contracting service companies operating in the field of engineering, geology and environment both in Ireland and internationally". The many positive legacies of the base-metal mining industry have been well described in a recent government sponsored report, "A social, environmental and economic assessment of Galmoy and Lisheen Mines", AECOM, (2020), in which the financial returns to the State, the long-term employment prospects of the local population and the lasting infrastructure, such as wind farms remain after the mine has closed. In respect of mining it is noted that "Mining companies operating in Ireland in recent decades have worked responsibly to meet and maintain the high standards of compliance required, and to leave environmentally low risk, safe sites for future use. Companies have, in a planned way, closed mines carefully, restoring these sites to agricultural uses and/or facilitated other potential industrial uses", (IGI, 2021).

Exploration, consent applications and operations all require early and regular engagement many stakeholder groups including local residents. Mineral explorationists, in particular geologists and samplers are, and always have been, to the fore-front in interaction with people on-the-ground. Indeed, it is very note-worthy that since the inception of modern exploration in Ireland there has been no on-the-ground opposition to mineral exploration. Yes of course there have been questions, for example, Why here? What are you doing? Will it cause damage? Mineral exploration geologists in Ireland and their associated staff have always adopted a transparent

attitude and methodology of what they are doing and what they hope to achieve. As noted in the SLR Report (2016), "Thus, at the exploration stage, with high levels of person-person engagement among geologists and community stakeholders, trust is high". Of course, there has been some opposition to access, but invariably it has been resolved satisfactorily. When a project and the various environmental protection measures and scientific data is explained to the local farmers and residents, a project can run smoother. The ability and role of exploration geologist, environmental geologists and field technicians to recognise and plot their way through the intricacies of Irish land ownership including short and long-term leasing arrangements, forage and crop saving arrangements, often of a non-contractual nature, without any recourse to legal advisors has meant that the minerals exploration industry has suffered very little from adverse publicity. The technical term for this is "ESG", the practical term is "Time to Talk".

Given the strong distinction between minerals exploration and mining as detailed in the Draft Policy Document, the emphatic comments at recent meetings by Department personnel that they are two separate industries, and taking account of the very laudable proposal to set-up an Advisory Body, we suggest, in order to avoid conflation, that two bodies be set-up, one dedicated to minerals exploration matters and the other to mining matters.

High Tech Industries

Ireland is proud of the high tech social media companies whom base themselves here or have originated in Ireland. However we have also seen in the past few weeks that the positive aspects of siting data centres in Ireland has led to a huge increase in demand for electricity. During the past year, we have seen the over-reliance on renewable energy and an absence of proper infra-structural planning leading to amber alerts in Ireland in respect of the national electricity grid. We are in the fortunate position that as minerals exploration geologists we can make contributions to reduce the chances that this could arise in the future. We have the ability to find the energy critical elements (ECEs) for the alternative energy systems and the ability to find the zinc for the battery storage facilities. This serves to emphasise the oft forgotten fact that there will be increased requirements for the 'traditional' metals such as zinc and lead, which are being

produced here, as well as metals such as copper, silver and gold which are required for the tech-based hardware devices upon which the social media companies based here depend upon.

In addition, as Minister Ryan has recently pointed out, the 'big data centres, which use an enormous amount of power, could not expect to be exempt from the national requirement to conserve energy in order to meet climate change commitments'. Since these data centres have a long life, anything not built during the next 5 years will have an impact for at least 25 years. It will mean that Irish data will be stored elsewhere, using tonnes of metal wiring and energy without any control by Ireland on the sourcing of such material.

Contribution of Minerals Exploration to Knowledge

Minerals exploration in Ireland has contributed enormously to our geological knowledge. The bulk of the data used in the compilation and publication of the recent geological maps (1:100,000) has stemmed from the drilling carried-out by the industry. Knowledge of the metal content of Irish soils has been extensively enlarged. Irish geophysicists have been very involved in the testing and development of new methodologies and better interpretation of data produced by the older methods.

We strongly endorse the comments in regard to Irish minerals exploration expertise. The enhancement of this expertise and its export potential can only be realised when there is a solid foundation for it at home. The potential at present is particularly good because of the fact that Ireland is only one of a handful of EU countries with a minerals exploration industry and its sustainability will be enhanced by a positive attitude to exploration in Ireland. It is note-worthy that minerals exploration and mining are the only two industries in Ireland which do not qualify for State funding. This is surprising given the FDI input into both and the impact on export earnings. The successes of minerals exploration and mining during the 1960s led directly to a European-based manufacturing company moving its mining equipment plant to Ireland to supply the Irish mining industry and the facility, which received world-wide praise a number of years ago, continues to this day. Ireland has shown that it has the potential to source critical raw materials necessary for the Green Economy, that it has the expertise to find and develop them

and, given a chance, that we have the potential to build an export manufacturing industry around them.

Out-Sourcing

By producing our own (be it Irish or European) metals and minerals we will be not only saving millions of euros in transportation, but it will also have a huge downward positive impact on the carbon footprint. As was stated in the webinar presentations, it doesn't make sense to mine material, transport it thousands of kilometres for processing and then transport the end-product and/or manufactured item by air or sea to its European destination.

Central to all of this are two over-lapping concepts: 1) export of our carbon footprint / export of our waste, and; 2) access to alternatives. This concept is particularly relevant to Climate Change because it emphasises the difference between weather and climate. By 'exporting' our carbon footprint to a third world country, we are exporting our waste and worse-still we are not reducing our own carbon footprint. In fact we are increasing it because we are having to import the finished product a great distance. In reality it means that if we want a product, and the raw materials are available here, then whatever the environmental cost it will be less carbon impacting than if we were to import it from afar. Wind turbines are rightly seen as an alternative to fossil fuels. However, in order to convert wind energy to electric power, large magnets consisting of rare earths are required. The rare earth minerals usually comprise about 7% of the mineral deposit and the particular rare earth of interest usually comprises <1% of the metal content of the deposit. Not all of the remaining 99% has to be disposed of as waste, but more than 90% is not presently useable elsewhere. The mine producer is not creating the waste, we are because we are the user of the magnets and the owners of the smart phones. Transporting the raw material to the refinery and its subsequent transport to Ireland produces a significant carbon foot-print.

If we have an alternative deposit in Ireland, then surely it behoves us to produce the rare earth metals for our own use and for their use by our industrialised European neighbours. In addition, because solar panels and wind turbines are multi-locational, they will require much longer metal-

wiring linkages, mainly copper, which means that the near to mid-term demand for copper will increase significantly, along with increased transportation to Europe. This copper will have a long-life, thus substantial recirculation is unlikely for at least 50 years. Re-enforced cement platforms will be required for both systems, adding to energy consumption.

Energy produced by the wind and sun is fluctuating, as we have witnessed here than that produced by fossil or nuclear fuel, therefore greater energy storage capacity is required for renewable generation sources. The near-term solution, which is being tested in New York, is zinc batteries. Fortunately, we are a major producer of zinc. In the same way as the EC put its full weight behind the 'European Battery Alliance', we should put our full weight behind zinc storage batteries.

This is in effect what "responsible sourcing" is all about. The best way to control the environmental impact of mining is to mine ourselves, having already carried-out the successful exploration. If we decide to impose unachievable standards on any 'new' mines, then we can hardly complain if other countries have a more relaxed attitude. Of course, it hides the visual environmental impact from us, e.g. importing peat from Latvia for sale in Tullamore. And if we impose our standards on Third World mines which with long-transportation foot-prints, it becomes a self-defeating climate action process. Far better to set our own robust, science based standards and maintain control of the impact of the mine during exploration, operation and closure. In all of this it should not be forgotten that a mine, as illustrated at Galmoy and Lisheen, along with Navan and elsewhere has a very positive impact on the local economy be it the increase in incomes, the production of goods, the creation of services, investment in farming and the rise in living standards.