

**GEOSCIENCE
IRELAND**

Exploring
Developing
Sustaining



Strategic Review

Geoscience Ireland
2018 – 2022

Geoscience Ireland Strategic Review 2018-2022

Prepared by: Dermot Duff B.E., M.Sc., Dip. Exec. Coach.

Dermot is a Teaching Fellow and Adjunct Professor in Trinity Business School, lecturing in Strategy, International Business Development, and Operations Management. He was previously Executive Learning Director in the Irish Management Institute.

An Electronics Engineer by profession, he held senior management positions in ITT Alcatel in Holland and was European Transformation Manager for Digital Equipment Corporation (HP). His early career was in Oil Exploration in Africa and the Middle East. He is a member of the Boards of several local companies, and is a business advisor coach for Enterprise Ireland.



Dermot has published widely, including Strategic Cost Reduction (2011) and Project Management: A Practical Guide (2010), and Managing Professionals - and Other Smart People (2014).

He has facilitated the preparation of strategic plans for over 30 organisations in the public and private sectors.

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Foreword

Geoscience Ireland (GI) is a successful cluster of companies brought together in response to the economic crisis of 2009. Geological Survey Ireland and Enterprise Ireland along with a reference group of five companies delivering geoscience advisory services to infrastructure and extractive industries came together in 2010 to arrest the resulting acute job losses in the sector.



In order to save and create valuable and skilled jobs, it was clear that geoscience skills developed in the Irish market needed to be sold into international markets. Growth of overseas markets allows for greater resilience and increased scale for Irish companies. Initial focus was on work flowing from International Financial Institutions, mainly in Sub Saharan Africa; this led to GI's collaboration with the Department of Foreign Affairs and Trade.

It was also clear that collaboration between Irish small- and medium-sized enterprises (SMEs) was essential in order to win large international contracts. In order to foster and develop this collaboration, GI was placed on a more formal basis in 2012 with the appointment of a full time Business Development Director based in Geological Survey Ireland (GSI). Since then, the target markets and sectors have widened considerably to include infrastructure development in the Gulf, the Balkans, the UK and the Nordics. Membership has expanded to include contractors and the Irish offices of large international consultants and GI is now a network of 36 companies delivering integrated expertise in water, minerals, environmental, infrastructure in over 50 countries.

The GI network is founded on a belief in the value of shared effort, selective collaboration, industry leadership, client focus, innovation, combined resources and stakeholder support. The ambition is help each Member Company achieve greater business success, increase employment and make each company a "great place with which to do business".

The preparation of this strategic plan allows us to take stock of where we are in the geoscience industry today and plan a path forward. As the global and domestic economies recovered, job creation by GI companies has been consistent and impressive, resulting in the creation of over 1,100 net new jobs between 2012 and mid-2018; 835 of which were created by the SME cohort. 40% of all jobs resulted from projects delivered in international markets.

As the sector is close to full employment, the challenges facing the cluster have changed. Skills shortages and the low level of entry to third-level science and engineering disciplines in the early 2010's are restricting

growth of the sector; a communications strategy is required to promote geoscience at national school level. Uncertainty is always a feature of commerce; current uncertainties and threats include Brexit, international trade disputes and the cyclical nature of commodities and oil and gas markets which all impact investment decisions, trade and customs norms, and currency and financing costs. The rebound of Ireland's construction sector has indeed witnessed significant employment growth in this recently beleaguered sector, but now faces competition from overseas companies which are targeting Ireland's high value construction tenders and major infrastructure developments. Ireland, and its export agencies, must maintain its pragmatism in supporting its indigenous companies in winning business overseas.

The success of GI derives from many sources; I acknowledge the contribution of the Steering Committee, GSI and GI staff but most especially the support of the Member Companies without whose engagement the initiative will not prosper.

This plan will result in a road map for these challenges and will provide renewed vigour and resilience in the industry, ensuring continued overseas income and job growth.

Matt Collins

Assistant Secretary; Department of Communications, Climate Action and Environment

Preface from Geological Survey Ireland

My predecessor as Director of Geological Survey Ireland (GSI), Dr Peadar McArdle, was the driving force behind the creation of Geoscience Ireland (GI). It was an innovative and farsighted response to the collapse of the Irish construction sector and related geoscience business in the late 2000's, involving both the Survey and the national trade agency, Enterprise Ireland. Its creation was also an innovative step in extending the role of a national geological survey.



The GI initiative now operates across government and includes continuous interaction between GSI and its parent Department of Communications Climate Action & Environment; Enterprise Ireland and the Departments of Foreign and Trade, and of Business, Enterprise and Innovation. GI aligns very well with the evolution of a "Team Ireland" approach to developing international trade. In addition, GI has established close links with trade and commercial bodies in Ireland and abroad as outlined in the Government's 'Global Ireland 2025' Policy, thus enhancing promotion and connectivity.

This strategic plan has been prepared against the background of significant achievements by the sector but with many challenges facing the industry including political upheaval in the UK, the US and beyond; challenges in relation to social acceptance; the emergence of "Super Consultancies" offering full design and construction solutions across multiple sectors; the infrastructural deficit being addressed in Ireland, leading companies to refocus exclusively on the Irish market. The plan sets out the manner in which GI will adaptively serve the geoscience sector but will evolve over time in response to ever changing circumstances. Proposals set out in the plan under three key "pillars" will be assessed to ensure that the objectives of the proposals are fully realised.

There is much to be positive about. The commitment and passion of Member Companies are clear to see, as is their belief in a strong industry. Collaboration and cooperation between Members has grown over time; a key learning has been that an apparent lessening of control leads to greater cooperation and success within the cluster. Business between Members has evolved, as has greater interaction of Members with GSI and the wider geoscience community, including the vibrant research and development sector.

I look forward to working with all stakeholders in delivering on the proposals set out in this Strategic Plan.

Koen Verbruggen

Director; Geological Survey Ireland

Message from Enterprise Ireland

Geoscience Ireland (GI) is an exemplar of a successful business cluster supported by several government agencies. The initial concept arose in 2010 from cooperation between Geological Survey Ireland and Enterprise Ireland (EI); it now attracts support from the Departments of Foreign Affairs and Trade and Business Enterprise and Innovation. Continuing advice and training has been obtained from EI and its programmes such as 'Management 4 Growth'; Neary Marketing & Communications; the Irish Management Institute and Trinity College Dublin Business School.



GI and its Member Companies have made extensive use of EI services and have participated in Trade Missions to Canada, the Gulf and West Africa; supported Market Study Visits to Sweden, Australia, the UK, Saudi Arabia and the UAE and undertaken joint promotions at international trade fairs i.e. INTERMAT (France), the Prospectors and Developers Association of Canada, Trafikverket (Nordics) and Mining INDABA (South Africa). GI has also developed strong working relationships with EI's overseas office network.

Inward Buyer Visits to Ireland from International Finance Institutions, USA, Canada, UK, France and the Gulf, arranged by EI, have seen close involvement and participation by GI and its Member Companies. The Member Companies have also availed of EI advisory and support services in relation to market research and market entry strategies.

In developing other business clusters in aviation, agribusiness and fintech, EI has drawn on its experience with GI in developing effective collaboration networks. EI welcomes GI's more recent alignment with its French counterpart, Pole AVENIA, and sees considerable scope for additional alliances in the future.

Dermot Reidy

Senior Development Advisor; Enterprise Ireland

Executive Summary

Geoscience Ireland (GI) was formed almost 6 years ago, in response to the financial crisis, to preserve and grow employment in key geo-related companies. GI has filled this remit beyond the most optimistic expectations, with Member Companies creating over 1,100 net new jobs – 835 of which were created by the SME cohort. This was aided by the overall economic recovery, of course, but GI is acknowledged by the companies as having played a critical and highly proactive role in preserving these companies.

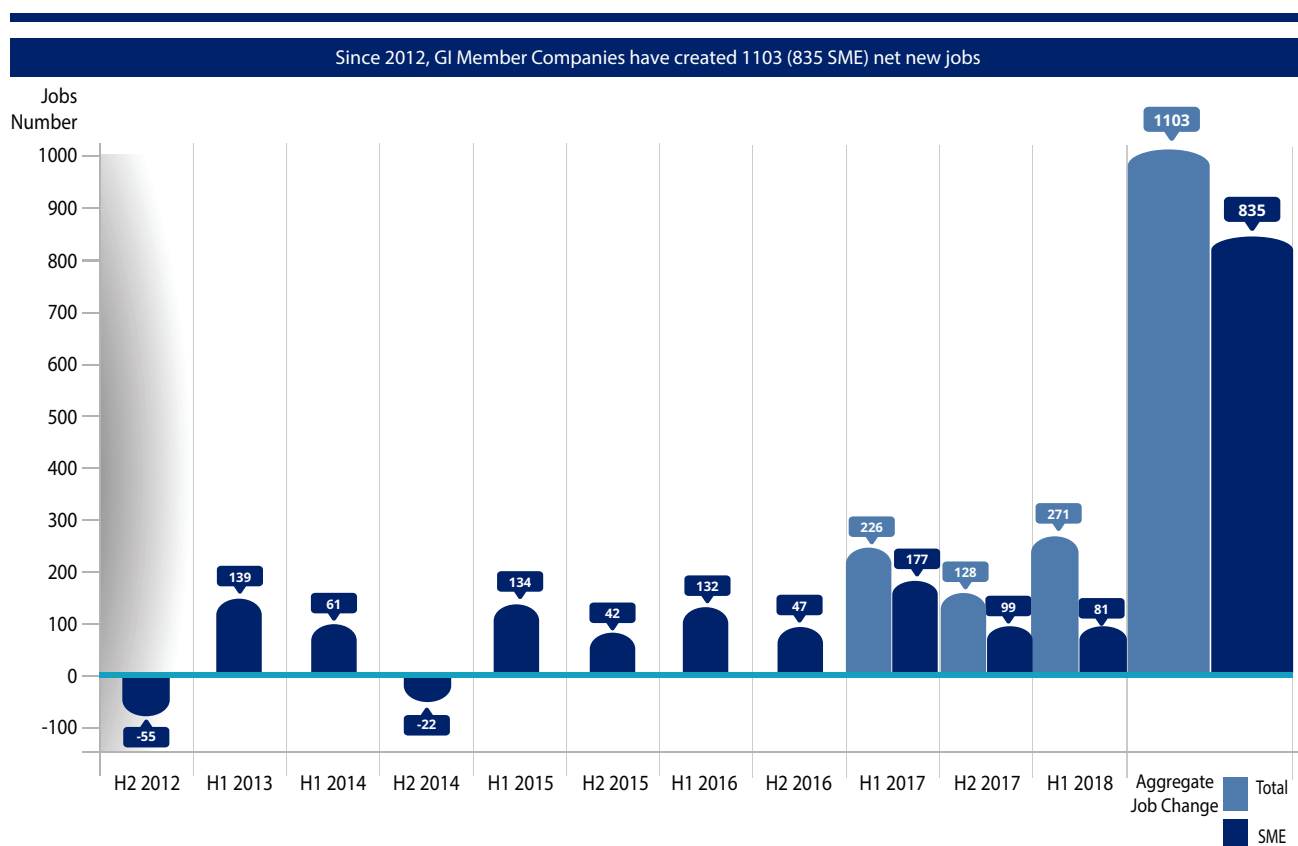


Figure 1: Representation of Job Growth by GI Member Companies

As the construction and extractive sectors are recovering, and Ireland is reaching full employment, GI is now planning how to serve the needs of the Members for the next 4 years. Geoscience Ireland has set major targets arising from this Strategic Review which are set out as follows:

1. Continuing upward job growth; 2018 Goal: 150 net new jobs
2. Enhancing the ongoing engagement and cohesion of Members
3. Developing the GI Procurement Hub, and a CRM system to map and manage relationships
4. Achieving 'European Cluster Excellence' Accreditation
5. Building corporate resilience within Member Companies

GI has had commendable success, in just 6 years, developing this vibrant cluster, and in the following pages, the strategic plan for 2018-2022 is set out, resting on the three original “Pillars”, namely:

Pillar 1:	Maintaining the Core Focus on Members’ Business Growth
Goal:	To continue supporting its Members’ ambitions and focus its activities toward end-clients and markets.

Pillar 2:	Continued and Expanded Internationalisation of Members Business
Goal:	To enhance market knowledge and market access opportunities.

Pillar 3:	Promoting and Strengthening Geoscience Ireland, Growing its Influence and Visibility
Goal:	To promote and invest in Ireland as being a centre of geoscience excellence and to attract graduates and apprentices.

While the construction sector, and some minerals sectors, continues to recover, the economic forecast (for Ireland) has issues of concern, with major shocks anticipated from Brexit, US foreign and fiscal policy, and the rise in prominence of Asian competitors.

Brexit is expected to have a profound effect on bilateral trade between Ireland and the UK; indeed Irish exporters are already feeling the effects of weakened currency exchange which, in turn, allows for the favourable pricing of services of UK companies in the Irish market. Over twenty GI Members provide professional services and works in the UK and are concerned about the future, in particular, access to the market, access to finance, and delayed investment decisions in the UK.

GI’s offer is based on the reality that competition in this sector is international - not local: even the biggest Irish companies lack the resources to truly compete internationally, but by combining resources, the network offers both small-company flexibility and large-company scale. Ireland has experience in clustering, of varying kinds, and has been prominent in a whole range of industry collaborations, such as dairy (Ornua), food (Bord Bia), the International Financial Services Centre, Sustainable Food Systems Ireland, the Irish Medtech Association, pharmaceuticals, and the ICT sector.

The firm belief is that repeated success in collaborative tenders and joint business activities will foster sufficient levels of trust to enable profitable cooperation between Members.

1. Introduction to Geoscience Ireland

Geoscience Ireland's **Mission Statement** is to assist its Members in **Winning Business Overseas**

Geoscience Ireland (GI) is a cluster of 36 Member Companies, delivering integrated expertise in water, minerals, environmental and infrastructure development to clients in over 50 countries. It assists its Members in winning business as follows:

- Membership of the network enhances brand recognition and opens new routes to market.
- By pooling market knowledge, sourced by GI, and leveraging Team Ireland's support services, companies can expand their global reach and identify opportunities that would not otherwise be visible.
- Joining this networked community facilitates the growth of a geoscience cluster, concentrates power, accelerates technical development, deepens the talent pool, leverages research and promotes innovation.
- GI offer full-time tender tracking, market intel and support for joint bid activity.
- GI actively promotes Member Companies in a wide range of international exhibitions, conferences, trade shows, industry fairs and business networking.

The GI network provides design, consultancy and contracting services to governments, the private sector and International Financial Institutions such as the World Bank, the Asian Development Bank, and European and United Nations development programmes.

Since its inception, GI Member Companies have created over 1,100 jobs and generated over €920 million in turnover; this performance highlights the importance of GI in the wider Irish geoscience sector which employs over 24,000 people indirectly and had a total value to the Irish economy of €3.2Bn in 2016 (Indecon, 2017).

1. A Geoscience Ireland Time Line And Membership Growth

The timeline shown below traces GI's impressive growth since its inception just 6 years ago, starting with the foresight in conceiving this multi-party initiative to rescue an industry under severe threat:

- **2009** | Sharp fall in Infrastructure spending in Ireland from 2009 left many companies facing cutbacks and losses.
- **2010-2011** | GSI and EI, plus 5 Reference Companies in the geoscience sector, identified opportunities for Irish companies in international markets; Geoscience Ireland was born.
- **2012** | Sean Finlay was appointed Business Development Director; Membership growth: 5 to 17
- **2013** | Membership: 22 Companies
- **2014** | Andrew Gaynor appointed Business Development support; DFAT joins GI Steering Committee; Membership: 24 Companies
- **2015** | Membership: 26 Companies
- **2016** | Membership: 31 Companies; GI Members agree to attract larger companies to the cluster
- **2017** | Andrew Gaynor appointed Business Development Manager; Elizabeth Murphy and Stephen D Walsh appointed Market Advisors; DBEI joins GI Steering Committee; Membership: 33
- **2018** | Membership: 36 Companies



Figure 2: the 36 Members comprising the Geoscience Ireland cluster

GI's Member Companies continue to win business in mature markets such as the UK, the Nordics and North America, and in emerging and developing markets including the Gulf and Sub-Saharan Africa. Over twenty GI Members actively work on projects in the UK which range from civil and economic infrastructure including rail, underground, highways and marine development, to renewable and conventional energy, and mineral exploration.

APEX Geoservices, Gavin & Doherty Geosolutions (GDG) and ARUP (Ireland) track projects in the technically challenging geological environment of the Nordics. Across Europe, FLI Group, Murphy Surveys and Designer Group provide professional services and product supplies to the French, German and Polish markets; while J.B. Barry Consulting Engineers continue to supply expertise to utility developments in Eastern Europe.

J.B. Barry has also completed significant water development in Lesotho which supplies South Africa with 'this critical resource. Nicholas O'Dwyer provides civil engineering solutions and project management for road and water projects in an array of African countries which are supported by development programmes from the International Financial Institutions (IFIs); it recently won a major road project in Zambia. SLR Consulting (Ireland) has strong track record in winning IFI projects and delivers capacity building and environmental and social consultancy to the natural resources sector; it recently completed a capacity building project for the Mozambique government and is now collaborating with GI Member Lisheen Technical and Mining Solutions (LTMS) on a similar World Bank project.

Verde Environmental is a prime example of an SME which, via an Irish Government-led Trade Mission to West Africa, announced it won a major environmental study in Nigeria; Verde works closely with GI Member **PW Group** which is based in Abuja and provides construction and mining works. Neighbouring Ghana is home to **PW Mining International** which provides contract mining, civil engineering, and building construction services to both private and public sector clients in a number of West African countries. PW Mining International and QME are partnering to pursue underground mining projects in West Africa. In 2017, **Compass Informatics**, which develops software solutions for geo-related sectors, designed and re-developed a GIS portal which enables the sharing of biodiversity information and spatial data across multiple stakeholders within South Africa. **Intersocial Consulting** is a leading social consultancy that advises on land access and resettlement, social impacts and stakeholder engagement in developing regions including Africa and Asia.

ByrneLooby successfully entered the Gulf market in 2009 and now has an office network in the region providing civil, structural and marine engineering services to public infrastructure and the oil and gas industries. LTMS, **Fehily Timoney & Co** and Apex are further examples of GI Members which provide niche and expert skills in the Gulf. **Lagan Asphalt**, now part of Breedon Group, manufactured and supplied the Polymer Modified Bitumen (PMB) on the first project of its kind in Oman.

In terms of strengthening GI's global reach, **Roadstone** joined the cluster thus enabling introductions to its broader CRH network of overseas offices. Similarly, **Mincon Plc** is a well-established brand and supplier of drilling products to the minerals sector and has office and manufacturing facilities across five continents. The global consultancy houses: **ARUP**, **AECOM**, and **ERM** are examples of companies which, through their Irish offices, target international commercial projects which are delivered by their Irish staff.

A key activity for GI and a number of its Member Companies is participating at the annual Prospectors and Developers Association of Canada's (PDAC) Convention in Toronto at which GI hosts the "Ireland – Open for Business Forum" in collaboration with Enterprise Ireland and the Department of Foreign Affairs and Trade. Ten GI Member Companies – **BRG** (geological, exploration and environmental consultancy), **ERM Ireland** (environmental, health, safety, risk, and social consulting services), **Irish Drilling** (geotechnical investigation and mineral exploration drilling), **LTMS** (mining, technical services and project management company), **Mincon** (developers and manufacturers of hard-rock drilling tools), **Priority Drilling** (mineral exploration), **PW Nigeria** (contract mining, civil engineering and construction), **PW Mining International** (contract mining, civil engineering and construction), **QME** (mining and tunnelling) and **SLR Consulting Ireland** (environmental and natural resource advisory) - participated at the 2018 event. The Canadian and US markets are serviced by LTMS, GDG, **Pavement Management Services** (pavement engineering consultancy) and **Geo-Drilling Solutions** (GDS; ground engineering).

A number of the abovementioned GI Companies are active in the UK; as are **Trench Control** (piling and ground support), **AWN Consulting** (environmental and acoustics), **TOBIN Consulting Engineers** (Civil Engineering) **Meehan Drilling** (ground engineering), **IE Consulting** (water and environmental), **IGSL** (geotechnical drilling) and **Rubicon Heritage** (archaeology).



Figure 3: Representation of Member's Sectors

Collaboration between Members, and subsets of Members, arise when suitable commercial opportunities and tenders are identified where Members with complimentary skills can support a competitive bid (see Figure X); this may take shape in joint-bidding or where one GI Member is the lead-applicant and another GI Member sub-contracts. GI also maintains a Panel of Experts which supports and assists Member Companies in tendering and delivering projects internationally by way of added expert capacity.

GI Member Companies	Project	Location	Client
Apex Geoservices & Nicholas O'Dwyer (NOD)	45km Pipeline	Malawi	Public Authority
SLR (Ireland) & Verde Environmental	Nigerian ESAI	Nigeria	International Financial Institution
Apex & SLR	Geothermal	Kenya	Private Sector
PW Mining International (PWMIL) & FLI Group	Tailings Pond	Burkina Faso	Private Sector
TOBIN Consulting & FLI	Biogas Plant	UK	Private Sector
BRG & Apex	Mine Project	UK	Private Sector
Priority Geotechnical (PGL) & GDG Geosolutions	Scotland Motorway	UK	Public Authority
BRG & Apex	Tunnel	Norway	Public Authority
GDG & BRG	Mine Project	Morocco	Private Sector
SLR & NOD	Capacity Building (Mining)	Tanzania	International Financial Institution
PWMIL & NOD	Gabon Airport	Gabon	Private Sector
SLR & Lisheen Technical and Mining Services	Capacity Building	Mozambique	International Financial Institution
PW Nigeria & Verde	Remediation Project	Nigeria	Private Sector
AWN Consulting & Meehan Drilling (MDL)	Remediation Project	Ireland	Private Sector
IE Consulting & MDL	Water Supply	Ireland	Private Sector
BRG & PDL	Motorway	Ireland	Public Authority
Irish Drilling (IDL) & TOBIN	Corrib Route Investigation	Ireland	Private Sector
PWMIL and QME	Underground Development	Burkina Faso	Private Sector

Table 1: Examples of Collaborative Bids

1. B The Geoscience Ireland Vision

Geoscience Ireland's **vision** for the next 5 years is to be a **globally recognised and highly respected network** of collaborating Member Companies providing expertise in geoscience activities. It is our ambition to facilitate the consolidation and growth of like-minded companies in this internationally-competitive arena.

Geoscience Ireland fulfils its **mission** of winning **business overseas** through these principal activities:

Assist Members in Winning Business

The primary purpose of all GI activities is to help its Member Companies identify and win business in international markets by fostering a member-centric, client-focused approach. GI provides market research, tender tracking, marketing and branding services which supports international bidding and selective collaboration on bids.

Facilitate and Strengthen Collaboration between Members

Sharing market intelligence; undertaking joint projects and sharing resources to enhance the social capital within the cluster of Members, and drawing on stakeholder supports and collaborating with state, semi-state and other business agencies and networks in Ireland and internationally.

Leadership and Innovation in the Geoscience Sector

GI acts to support the industry by demonstrating leadership in thought and action, and promoting the industry as a valuable creator of sustainable jobs that serve the economy well by generating overseas income and developing Ireland's infrastructure, natural resources and talent base.

Innovation plays a key role in adding resilience to the sector and GI provides links to Irish and international research networks, encouraging applied research and development.

1. C Governance And Staffing

Governance

Geoscience Ireland is governed by a cross-department and cross-sector Steering Committee, comprising representatives from Geological Survey Ireland (GSI), Department of Communications Climate Action & Environment (DCCAE), Enterprise Ireland (EI), the Departments of Foreign & Trade (DFAT) and Business, Enterprise & Innovation (DBEI) and four GI Members Companies.

The Committee is chaired by Matt Collins (DCCAE), with Koen Verbruggen (GSI) as Deputy Chair, and Sean Finlay as Secretary. EI is represented by Dermot Reidy and DBEI is represented by Eugene Forde. The industry is represented by Deirdre Lewis (SLR Consulting), Paul Doherty (Gavin & Doherty Geosolutions), Richard Crowe (Nicholas O'Dwyer Consulting Engineering) and Marie Fleming (ARUP), with Prof Dermot Duff as a representative of academia (Trinity College Dublin). Geoscience Ireland and its parent body (GSI) have also strong links with the Irish Centre for Research in Applied Geoscience (iCRAG) and other academic and research institutions.



Table 2: Representation of GI Steering Committee Members

Staffing

The Geoscience Ireland executive comprises four staff which provides assistance to Member Companies by way of networking, introductions, tender and market intelligence, organising workshops, participation at conferences and exhibitions, producing collateral and generally promoting the industry.

Geoscience Ireland lead by **Sean Finlay**, Director of Business Development, who has been a part of GI since its inception in 2012; **Andrew Gaynor** joined in 2014 and is Business Development Manager; **Elizabeth Murphy** and **Stephen D Walsh** joined as Market Advisors in 2017 as the cluster continued to grow in membership numbers and enhanced its overseas footprint.

1. D Review of Geoscience Ireland’s Achievements and Activities

Geoscience Ireland (GI) has been commendably active and astute in growing the sector, and has been notably successful in developing a cohesive and collaborative membership base, starting with just five founding Members in 2010.

Achievements

Successful Evolution: From Inception to Full Membership

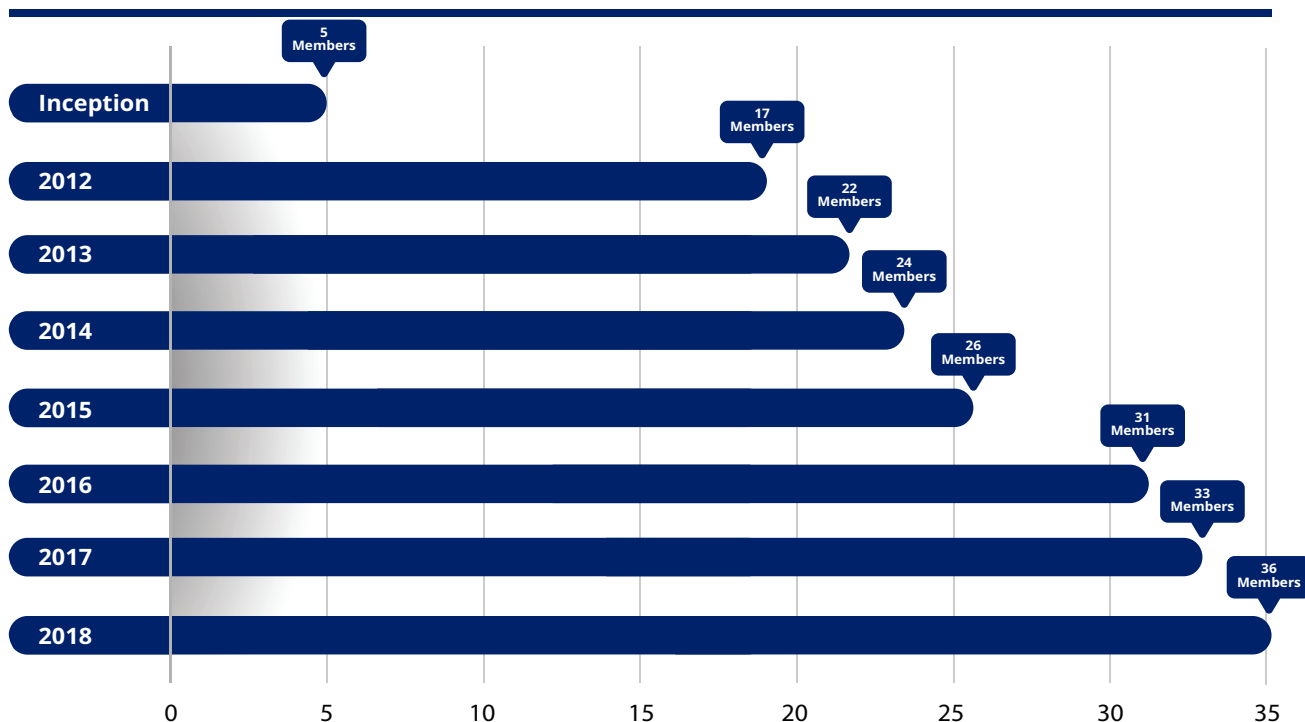


Figure 4: Growth in Membership since 2012

The strong growth of GI is instructive of the value which companies in the sector place on the services and support that the cluster offers, thereby supporting the growth of these companies through the export of their services. GI has now reached almost a full complement of regular Members (currently 36) and has the active support of larger companies in the sector: these provide a bridgehead to international contracts and serve as exemplars of how Irish companies can expand sustainably, creating significant career opportunities and substantial job opportunities.

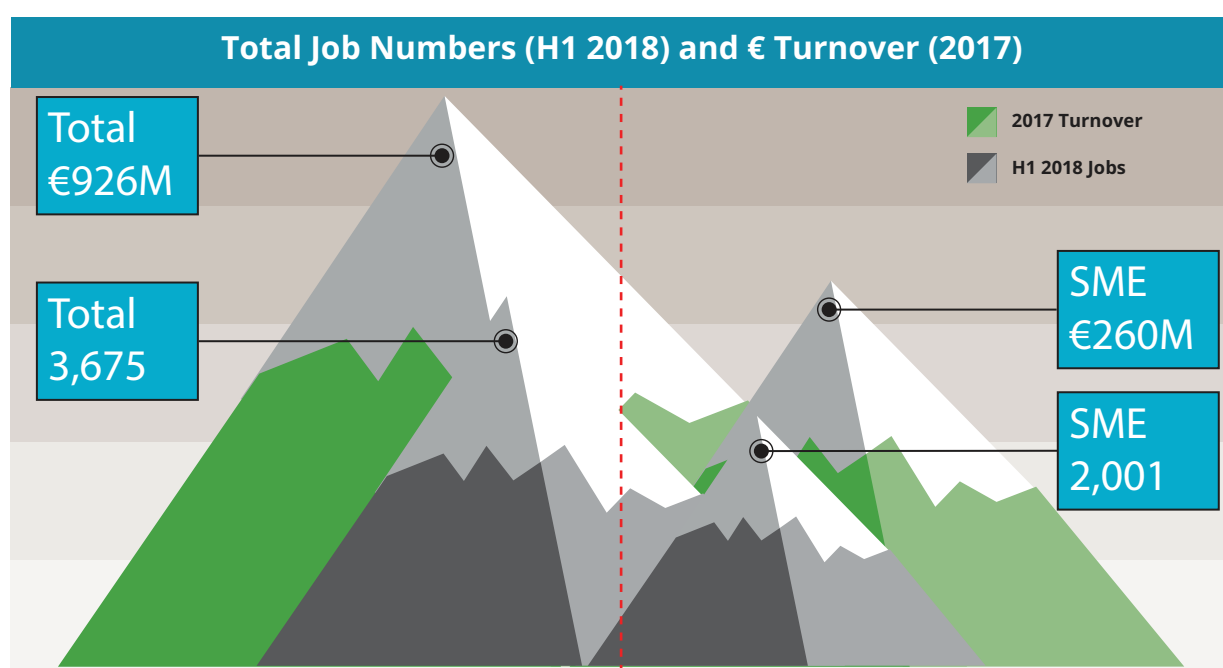


Figure 5: Total Employed (H1 2018)

The number of companies offering geoscience related services in an Irish context is indeed small in comparison to other European countries, such as France and Germany. The Irish community of geoscience companies however is winning business over and above what would be typically expected, on consideration of the €926 million turnover of GI's Members in 2017. Over the coming years, the number of GI Member Companies is expected to grow; however it should be noted that this expansion is not infinite. This fact does not present an issue for the cluster however as it affords the opportunity to GI to focus its services on maximising the opportunities for its membership base and to afford the greatest attention to the individual needs of each Member Company.

Issues and Risks: Organisations of this type, by their very nature, are comprised of Members from the same sector, which compete in the marketplace. This creates clear opportunity for conflict, overt or otherwise, and, while there is an ongoing risk of fracture, GI has ably managed relationships between Members, and is widely seen as supportive and diplomatic.

Job Growth by Members

Job growth is one of GI's key priorities for the development of the Irish geoscience sector. Over-reliance on Irish construction and infrastructure investments presented a serious threat to the viability of the sector during the economic downturn. The recent resurgence of the Irish economy has contributed to job growth however the export-orientated perspective of the GI Member Companies has demonstrably lead to the commercial growth of the Member Companies and the addition of high value jobs to the Irish economy. Since its inception, the companies have created over 1,100 net new jobs – 835 of which were created by the SME cohort; through its continued support of these companies and the export of their expertise, GI will assist the Member Companies to grow their labour force even further.

This remarkable growth in job numbers is illustrated in figure 1 and 5: the cumulative net figure accounts for job losses as well as gains. This figure is forecast to rise further, if diaspora geoscientists and engineers continue to seek to return to their home country.

While this on-going initiative has been a success (and has allowed a phalanx of geoscientists to reverse emigration and return home), the advent of near-full employment has the converse side of creating upward pressure on salaries and wages, putting a strain on competitiveness. To counter-act this,

Most Irish firms in this sector are below optimal scale for international work, especially given the rise of global super-consultancies. In addition, the cluster is comprised of Companies in the same competitive arena. Both these factors make it difficult to forge the necessary alliances among Members and achieve sufficient scale to compete internationally.

Strategic Role of GI in Job Creation

The Action Plan for Jobs (APJ) is a key instrument of government economic and enterprise policy in terms of supporting job creation in Ireland. GI was cited as a case study in the APJ 2018 which show-cased the operation of the cluster as an exemplar which may serve to inform the development of clusters in other sectors of the economy. The APJ emphasised GI's support of companies in exporting their services overseas as well as directly engaging with training and educational institutions in order to develop the skilled workforce required to support the long term development of the geoscience sector.



The APJ put together an interlocking set of activities in pursuit of nationwide job growth, forming close collaboration between Government departments, agencies such as EI, and GI. This unified approach has produced commendable results. As such, GI has a strategic remit and, in turn, is expected to think and act strategically in the national interest of sustainable job creation.



As well as contributing to Members development through a series of relevant workshops on business development, marketing, innovation, communications, strategy and similar themes, GI has also taken initiatives in developing young talent, most notably through pioneering new-style professional apprenticeships, all with the close assistance of leading Members. GI, in partnership with Institute of Technology Carlow is in the process of establishing a **Geo-Driller Apprenticeship**. The purpose of this apprenticeship is to recognise the unique skills associated with the sector and to train the next generation of drillers to a high, internationally recognized standard. The development of the Geo-Driller Apprenticeship is a high strategic priority given that drilling is a key technical skill within the geoscience sector. Through the delivery of the programme of training, the pipeline of new operators into the industry will enable it to respond to the strong demand for drilling services across a range of existing areas such as site investigation and mineral exploration as well as to new areas of potential such as geothermal energy.

Activities

Engagement with Departments of Foreign Affairs & Trade and Business, Innovation & Enterprise

Since its inception, GI has been able to leverage the 'Team Ireland' approach to supporting the export of geoscience services and expertise to international markets. The support provided to the cluster through DFAT, particularly with reference to its representatives in International Financial Institutions and its consular network.

Through the DBEI, GI has been able to align its approach with wider industrial, economic and enterprise policy and has in turn influenced the focus on the role of clusters in support of Irish companies. An example of this influence can be seen through the inclusion of GI in the Action Plan for Jobs 2018 as a case study.



GI actively participates on Market Study Visits (MSVs) and Trade Missions (TMs) which are delivered in collaboration with EI and DFAT. Such Visits and Missions, which include networking events to enable clients to retain and build relationships with their international customers, are orientated toward mature, developing and emerging export markets. To date, GI has participated on MSVs and TMs to countries and regions including the Gulf, Canada, the UK, Turkey, Australia and West Africa with, and on behalf, of its Member Companies.

GI continues to establish close links with trade and commercial bodies in Ireland and abroad which, in doing so, aligns with the Government's 'Global Ireland 2025' Policy, thus enhancing promotion and connectivity.¹

Active Promotion of the Industry



GI has demonstrated great commitment to the active, on-the-ground promotion of Irish businesses, and has actively identified emerging opportunities abroad, linking Member companies with public and private business opportunities.

Notably, GI's delivery of the "Ireland - Open for Business" forum at the Prospectors and Developers Association of Canada's (PDAC) annual Convention and Trade Show serves as an example of proactive collaboration. 'Team Ireland' has been present at PDAC for over 25 years, and fielded one of its largest and strongest teams at PDAC 2018. Seán Kyne TD, Minister of State for Natural Resources, travelled with the Irish delegation and delivered the keynote address at the "Ireland - Open for Business" forum. The geoscience and minerals aspect of the Team comprised DCCAE, GI (including 10 of its Member Companies), the Geological Surveys of Ireland (GSI) and Northern Ireland (GSNI), and iCrag; while EI and DFAT participated

and minerals aspect of the Team comprised DCCAE, GI (including 10 of its Member Companies), the Geological Surveys of Ireland (GSI) and Northern Ireland (GSNI), and iCrag; while EI and DFAT participated

¹'Global Ireland - Ireland's Global Footprint to 2025', is the Government's initiative to double the scope and impact of Ireland's global footprint in the period to 2025; it includes Expanding and strengthening our diplomatic and enterprise agency presence across Europe, North America, North and West Africa, Asia-Pacific, Middle East and the Gulf region. [<https://www.ireland.ie/en/stories/global-ireland-irelands-global-footprint-2025>]

by way of promoting Ireland's export and trade excellence. GI's participation at this event is vital to building the reputation of Irish geoscience companies in the Canadian and global markets and, given the demand for geoscience related services, its participation has the potential to counterbalance any potential impacts which may be posed to Irish geoscience companies by Brexit.

International Collaboration and Industry Alliances

Collaboration is a key feature of the success which GI's Member Companies have enjoyed in pursuing successful opportunities overseas. It stands to reason therefore that collaboration between GI and its equivalent organisations in other markets would be a high priority.



GI leverages networks across Europe and beyond, with close connections to organisations such as NOF Energy (a member-based organisation formed in difficult times for North Sea companies after a collapse in oil prices) and Pole AVENIA (the French geoscience 'competitiveness cluster', with which a Memorandum of Understanding (MoU) was signed in July 2017. This collaboration enables the exchange of insights and cluster management practices which facilitate the enhancement of GI's support of its Member Companies. Significantly, GI partnered with Pole AVENIA and 6 other European geoscience clusters on the 'Geo-Energy for the 21st Century' (GEO-ENERGY EUROPE) project. The Project is funded by the European Commission's Competitiveness of Enterprises and Small and Medium-sized Enterprises (COSME) programme; the COSME programme is managed by the Executive Agency for Small and Medium-sized Enterprises (EASME). The project commenced in January 2018 with the objective of enhancing – through a transnational cluster – the performance and competitiveness of European geo-energy SMEs, in all industries which utilise subsurface energy for the project i.e. geothermal energy.

GI is involved with a wide range of business, trade and professional associations, including Chambers of Commerce: British, French and Arab; Engineers Ireland; the Construction Industry Federation, British Water, NOF, and Pole AVENIA. These linkages provide access to contacts and market intelligence and platforms to promote GI and its members.



Figure 6: GI's Partner Agencies and Associations

Service Delivery and Operations

GI, as well as identifying business opportunities for Members, has intensified the service it provides to the sector, notably through the creation, at very low cost, an online procurement hub. GI also scans a wide array of sources for likely tender opportunities, and acts quickly to notify Members, and, where suitable, forge joint bids and mutual responses to tenders.

The GI Procurement Hub (GIPH) is a bespoke online procurement platform for the cluster's Member Companies. The GIPH is unique in so far as it couples market insights, collaborative functionality and up-to-date procurement information focused exclusively on the geoscience sector. The GIPH initiative is a clear example of GI's commitment to providing useful a relevant services to our Members.

Research and Innovation

GI members are to the forefront of geoscience related research and development activities. Members actively collaborate with each other and the Irish Centre for Research in the Applied Geosciences (iCRAG). iCRAG is Ireland's national geoscience research centre supported by Science Foundation Ireland, the European Regional Development Fund, Geological Survey Ireland and industry partners.

iCRAG's multidisciplinary research transcends industry and academic boundaries to address key research challenges in the fields of energy security, raw materials supply, groundwater protection, safeguarding the geomarine environment and protection from the Earth's hazards. Comprising 150 researchers, seven research institutions and collaborating with more than sixty industry partners, iCRAG vision is to help unlock Ireland's natural resources through developing improved technical knowledge and innovative techniques which are embedded within industry.



Minimec Shotcrete Sprayer

Beyond participation with iCRAG, GI members engage in innovative product development to serve some of the challenges arising from infrastructural development. QME collaborated with Normet on the

'Minimec' mechanised concrete spraying manipulator. The Minimec is specially designed for smaller-scale sprayed concrete works. It is the recommended solution for mechanised spraying in escalator and tunnel shafts, small diameter tunnels or in places where access is unavailable to larger machinery.



Apex wins 2017 Engineers Ireland Excellence Award for Geoscience

In addition, GI Member's innovation is recognised by industry and are consistently represented within Engineers Ireland's Excellence Awards. The 2017 Awards for 'Geoscience' was won by a project developed jointly by **Apex** Geoservices and the School of Civil

Engineering at University College Dublin. The 2015 Geoscience Award was won by **JB Barry & Partners** for its innovative geotechnical design and management of the Ballaghaderreen bypass project; the 2016 Award was won by **Gavin & Doherty Geosolutions (GDG)**, together with Irish Rail, for the development of a ranking and assessment method for embankments and cuttings across the earthworks assets of Irish Rail .

2. Methodology: Developing This Strategic Plan

This section sets out the steps which were taken to develop this plan and the actions it signposts over the next four years. Geoscience Ireland (GI) has been guided by the needs of its Members since the commencement of the initiative in 2012 and in framing its operation up to 2022.

The iterative approach applied to the drafting of this review is set out below, and in detail within the following subsections:

- ✓ Literature Review – Clusters in Practice
- ✓ Stakeholder Interviews
- ✓ Focused Workshop
- ✓ External Environmental Analysis
- ✓ Strength Weakness Opportunity Threat Analysis

Literature Review

GI as a cluster fits within a wider field of study, focusing on the use of collaboration and cooperation to enhance the competitiveness of small and medium sized enterprises, particularly in export markets. Drawing on EU and US Government research², the key success factors in developing cluster associations can be summarised as follows, with Geoscience Ireland clearly meeting these criteria:

- ✓ **Economic rationale:** there must be a real value-adding business case for each Member, large or small
- ✓ **Earned trust:** trust is earned, not granted. Trust takes time to build, but can shatter in a moment
- ✓ **Shared intelligence:** none of us, alone, are smart enough to keep abreast of developments
- ✓ **Clear purpose:** GI's purpose is clear – Enable its Members to win business through the networking effect
- ✓ **Compelling vision:** Ireland has a successful history in cooperatives – GI want to be an acknowledged global community, a leader in geoscience business development internationally
- ✓ **Proactive marketing and industry promotion** – Only positive, determined combined action will produce the required results

²Solveil, O et al (2003); "The Cluster Initiative Handbook"
 Porter, M (1998); "Clusters and Competition: New Agendas for Companies, Governments, and Institutions."
 European Commission (2016); "Smart Guide to Cluster Policy"
 InterReg Europe (2017); "Project: CLUSTERS3 Leveraging Cluster Policies for Successful Implementation of RIS3"
 Danish Ministry of Science, Innovation and Higher Education (2013); "Strategy for Denmark's Cluster Policy"

Stakeholder Interviews and Focus Group

Building on the grounding established by the comprehensive literature review, the semi structured interview process facilitated the acquisition of insights from a cross section of GI's key stakeholders. Four critical themes emerged:

1. Collaboration among Members, especially in joint commercial activity
2. Market Diversification & Scale: the pursuit of perceived opportunities
3. GI Membership Criteria and Responsibilities: ensuring fairness, developing trust, maintaining integrity
4. Visibility of Geoscience among stakeholders, including members, funders and Government agencies

The stakeholders which were identified for one on one interview have longstanding connections with Geoscience Ireland, both as members and as representatives of the government departments and state agencies (the GI Steering Committee). In terms of the findings arising from these interviews, a synopsis of these findings is provided below.

This Strategic Plan was further developed by hosting a workshop where 4 working groups, involving 22 Member Companies, provided detailed feedback on the four consultation themes outlined above.

1. Build on success - continue the good work, and maintain the vibrancy and relevance of the cluster
2. Stay aware that the economy is inherently cyclical and is inevitably close to the next downturn
3. Continue to build the resilience of the Member Companies so that they can be in a position to compete internationally: this also helps protect the home base of geological and engineering talent.
4. Continue to provide practical supports, namely: market intelligence, business introductions, presence in international exhibitions, representation at significant conferences, liaison with DCCAE and DFAT, and especially concentrate on winning business in specifically targeted sectors and in specifically targeted geographical areas, such as the UK, Canada, Nordics, France, Sub-Saharan Africa and the Middle East .

5. Continue to utilise the tender tracking system to maximum effect, including the enhancement of the online portal: GI Procurement Hub (GIPH).
6. Build on the recent successes in getting different Member organisations to work jointly in winning and executing international business: have tender responses “pre-prepared” with the relevant information already collated.
7. Maintain cohesion among Members, many of whom are competitors: be especially astute in managing the relationships with large, marquee firms who have the potential to generate business for other Members but who are also clients of these Members. The issue of membership will require continued diplomacy and close liaison with the industry.



Figure 7: PESTLE Analysis

External Industry Analysis

Augmenting the qualitative analysis undertaken during the consultation process, a series of quantitative assessments were undertaken in order to plan GI's evolution. An external environment and SWOT analysis was undertaken in order to identify factors which have the potential to influence GI for the coming plan period.

In general, the issues facing the sector continues to be the volatility of the industry (with an 85% decline between 2007 and 2013), and its high dependence on infrastructural investment by Governments at home and abroad, fluctuating commercial development investment and prevailing price levels in energy and minerals markets.

Prominent factors include Brexit, emerging trade and tariff disputes, and the growing threat of intrusion by lower-cost professional services, notably from Asian countries. While these are not entirely negative trends, they illustrate the risks confronting the sector, prompting the need for greater resilience among Member Companies, increasing scale (through collaboration, joint ventures and other means), diversification into other economies, and greater innovation in services and indeed continued Government support. While the overall rise in economic activity in Ireland is expected to increase by 4% p.a., a recent report from the International Monetary Fund³ suggests Ireland remains exposed to externally-driven downside risks.

The brief Political, Economic, Sociological, Technological, Legal, and Environmental – PESTLE – analysis illustrated below captures key elements, including the acceleration of technology in geo-related industries, including engineering, and ever greater pressures arising from environmental concerns:

³2018 Article IV Consultation—Press Release; Staff Report; and Statement by the Executive Director for Ireland

Leveraging GI's Strengths and Exploiting Opportunities (SWOT Analysis)

The SWOT analysis helps synthesise the outputs from the earlier macro-economic, industry and external environmental analyses: these indicate that major economic and political shocks are likely and that the industry, and indeed Ireland's open economy, is quite volatile.

On the other hand, GI has considerable strengths (as listed below) with which to avail of business opportunities and to offset GI's main "weakness", namely its small size:

- GI has achieved **low cost Job Creation** through developing the industry and its members
- GI has displayed excellent **Trust Building capability**: GI is a surprisingly cohesive association of members, who compete and simultaneously collaborate within the cluster
- GI has an **effective Business Model**
- GI has **deep market knowledge**, implicit and explicit
- GI has **Privileged Access** to Project Sponsors, Funders, Gateway Stakeholders
- GI has Unique **Tendering & Bid Capabilities**
- GI facilitates **International Scaling** Capability
- GI has strong Irish **Government Support**
- GI has **Committed Leadership**
- GI has **strong links** to industry and other networks
- GI has **close links to IFIs**
- GI is aligned to the national **Action Plan for Jobs**

Synthesising the industry and internal analyses, the main opportunities emerge: these principally are opportunities to develop companies' international business by **enhancing management capacity** and through further joint activity (among members), facilitated by active networking, privileged access and better market entry, by enhancing the "brand" of GI and its members, with increased tender win rates through GI's self-developed tendering and procurement hubs, as illustrated below:

SWOT

Strengths	Weaknesses	Opportunities	Threats
- Trust Building Capability: A cohesive association - Low Cost Job Creation: leveraging membership - Deep Market Knowledge - Privileged International Access - Unique Tendering & Bid Capabilities - International Scaling Capability - Close Government Support - Strong Leadership - Deep links to Industry - Links to IFIs - Closely aligned to Action Programme for Jobs	- Small organisational size - Dependency on member's goodwill	- Increase membership through new categories - Joint tender and new business winning activity - Continued Development of Online Tender Platform: GIPH - Promote the GI "Brand" internationally - Target specific regions - - Northern Europe, France, Mid East - Develop member companies' managerial capacity - Strengthen member' economic and leadership resilience - Commission industry-specific development - Become a model cluster, internationally recognised	- Assumption that good times are eternal - Withdrawal of Government support, financial & otherwise - Member apathy - Macro-economic shock - - Trump, Euro, Interest Rate rise - Brexit-induced crisis

This SWOT indicates that GI has sufficient strength to capitalise on the many opportunities available to grow, not just the domestic job base, but to expand sustainably into international markets, thereby lowering the dependency on volatile domestic construction activity and infrastructure development.

The greatest threats appear to be in "declaring victory too soon", and losing Government support or Members' collaboration.

Maintaining or accelerating the present approach supports Government policy and indeed offers excellent returns to the Exchequer through income and other taxes from these STEM jobs, even if the rate of job growth will gradually diminish. Geoscience Ireland's "weaknesses" stem essentially from its small size, and its recent origins, but it partly overcomes this by leveraging Government assets and the resources of the membership base.

Perhaps surprisingly, given their relatively small size, Geoscience Ireland Members are well-positioned to avail of the opportunities that will emerge, provided the member base continues to act cohesively

3. The Way Ahead – The 3 Pillars, 2108 to 2022

Geoscience Ireland's Members and stakeholders have set major targets arising from this Strategic Review which the GI executive will progress and implement; these are in addition to the many other operational targets set, such as tenders identified, workshops held, research achieved, business won, collaboration supported, exhibitions and conferences attended.

1. Continuing upward job growth; 2018 Goal: 150 net new jobs
2. Enhancing the ongoing engagement and cohesion of Members
3. Developing the GI Procurement Hub, and a CRM system to map and manage relationships
4. Achieving 'European Cluster Excellence' Accreditation

Building Corporate Resilience Within Member Companies

As critical sectors in Ireland return to full employment (construction and infrastructure), and attract new investment (ICT companies, data centres), it became evident that Ireland still faces competitiveness challenges including:

- Supporting job creation in science, technology, engineering and mathematics (STEM) sectors,
- Strengthening to export markets as captured by Ireland's "Global Ireland" policy,
- Diversification post-Brexit
- Winning business from International Financial Institutions (IFIs)
- Delivering balanced regional growth in Ireland; more than 50% of the new jobs created by GI companies are outside Dublin.

The Strategy rests on the **Three Pillars** on which GI was founded, but these are now significantly strengthened:

Pillar 1:	Maintaining the Core Focus on Members' Business Growth
Goal:	To continue supporting its Members' ambitions and focus its activities toward end-clients and markets.
Pillar 2:	Continued and Expanded Internationalisation of Members Business
Goal:	To enhance market knowledge and market access opportunities.
Pillar 3:	Promoting and Strengthening Geoscience Ireland, Growing its Influence and Visibility
Goal:	To promote and invest in Ireland as being a centre of geoscience excellence and to attract graduates and apprentices.

This Strategic Plan will help ensure that these activities are aligned strategically for maximum effect.

While GI's mission remains unchanged, and the core focus remains intact, this will be bolstered by a number of initiatives, such as generation of extensive marketing data bases, the cataloguing of Member companies' special expertise, developing business leadership and building corporate resilience. GI's Steering Committee and stakeholder network, which comprises 'in-market' export agencies and business networks, will continue to offer supports and peer review of GI's approach to doing business.

Pillar 1: Maintaining The Core Focus On Members' Business Growth

Goal: To continue supporting its Members' ambitions and focus its activities toward end-clients and markets.

GI's approach to doing business is based on a deep understanding of its Members and maintaining an export focus which targets commercial projects and clients.

The GI cluster takes a distinctly proactive approach: primarily being a member's association, the GI staff takes further steps in gaining a deeper understanding of its Members and thus forges non-passive introductions on their behalf. Ireland's commercial agencies – Enterprise Ireland (EI) and the Industrial Development Authority (IDA) - deal with clients in a one-to-one manner with sector-specific teams, but not as a collaborating cluster.

A key criteria for GI Membership is participation from its Members and ongoing engagement and collaboration with GI staff and other Member Companies. GI hosts quarterly workshops, visits its Members on an annual basis and engages via telephone and email on an ongoing basis to elicit and understand Member's ambitions and market strategies. GI will enhance its approach to doing business by:

- **Member Company Development Plans** – GI, on an annual basis meets with its Members on a one-to-one basis to elicit the Members priorities in terms identifying its targeted priority/ Tier-One clients and markets of interest. GI will focus a Plan per company, identify workloads, progress the Plan with individual Members, and assess progress thereafter.
- **Supply Chain Mapping** - the evident dynamic of GI Members, and geoscience as a sector, is that it's cross-sectoral and the skill-set of an individual Member can be employed in numerous subsets of the industry. Developing a Supply Chain Map, in consultation with Members, of key projects will act as guiding material for when categorising skills and Member's capabilities.

Such projects or developments will range from the lifecycle of a mine, the development of a datacentre, a marina, or an offshore wind-farm, to name but a few.

- **The array of markets**, 50+, also demands a dynamic approach on behalf of GI staff to identifying commercial opportunities and trends outside of conventional market strategies; public sector and IFI contracts – which are generally available through transparent portals – are demanding on time resources, while private sector requires deeper networking of clients on behalf of members. GI will be aware of, the 'top three' markets which Members prioritise, and knowledge as to whether Members track commercial bids in the public sector, or the private.

In order to ensure an ongoing relationship with Members and for GI to be considered an '**honest broker**' or '**trusted intermediary**', GI acknowledges the importance of strong **social capital**.

GI is pro-active in developing social capital in two regards; firstly, the trusting and confidential relationship between GI Staff and the Member Company which evolves in a reciprocal way. Secondly, GI runs closed workshops for its Members on a quarterly basis which better comfort and connectivity between Members. In these workshops, Members and stakeholders provide updates on recent and current projects, and sectoral updates respectively thus allowing conversations – and the potential identification of mutual commercial opportunities – to flow.

Geoscience Ireland has a “conscious competence” in developing social capital in the cluster, and follows the approach illustrated below:

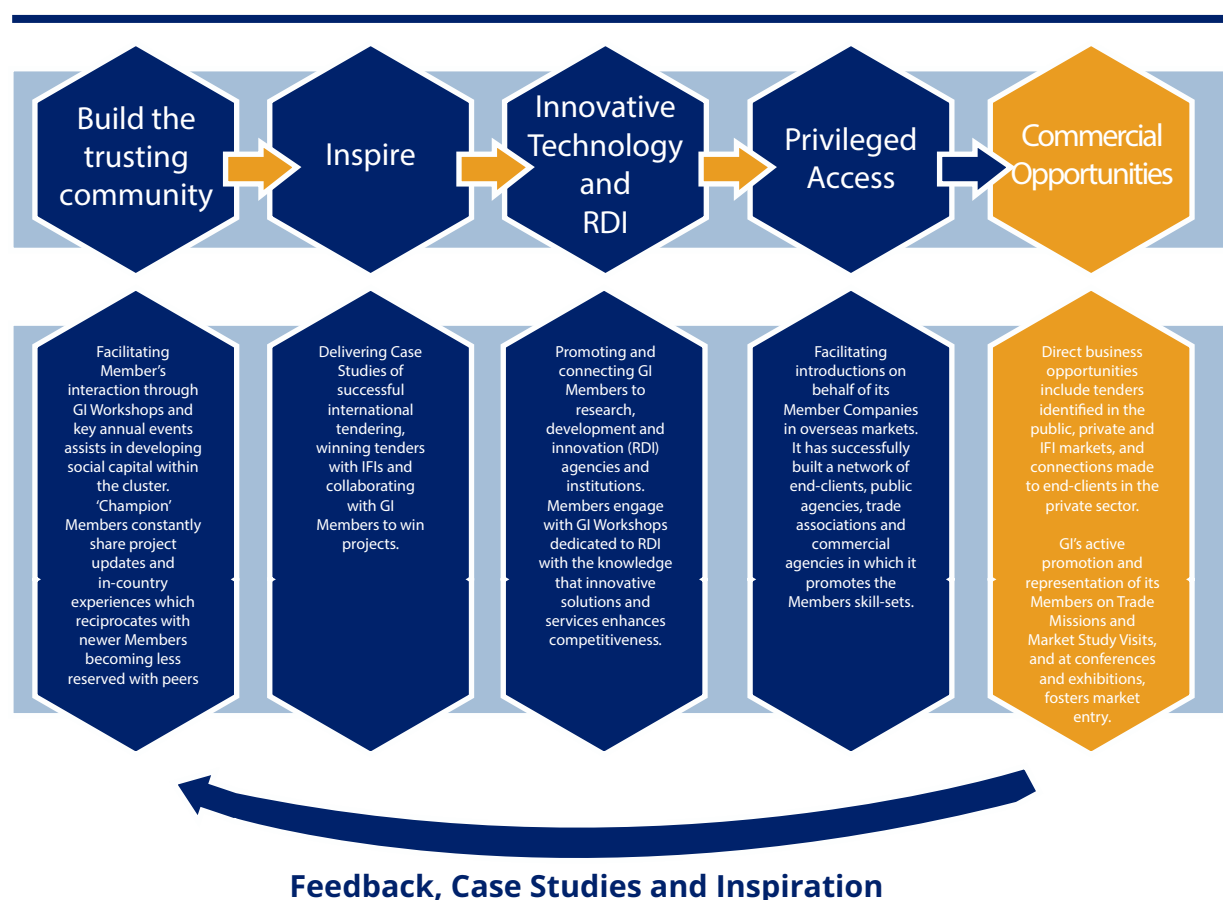


Table 3: Representation of the Reciprocal Approach to Developing Social Capital and Inspiring Knowledge Exchange

Pillar 2: Continued Internationalisation: Supports & Services

Goal: To enhance market knowledge and market access opportunities.

- Build on GI's base of services and supports as per Members' ambitions; tangible supports are:
 - o Market research and assessing pipelines of commercial opportunities,
 - o Tender tracking,
 - o Identifying and evaluating market access points.
- To support Member's uptake of the Geoscience Ireland Procurement Hub (GIPH) which is designed to capture the above in an online 'one-stop-shop' portal; GI will thereafter, through consultation with Members, evolve GIPH to its next stages.
- Deepen GI's systematic approach to representation at, and sponsorship of, events and conferences which align with Member's requirements.
- Team Ireland – in driving the “Ireland: Open for Business” agenda - GI works closely with Government departments in delivering the Irish brand on the international stage. To date, GI leads the “Ireland Day” at the PDAC mining convention in Toronto, takes an active role at the INDABA conference in Cape Town, and participates on relevant Trade Missions and Market Study Visits lead DFAT and Enterprise Ireland. We will continue to identify work with Team Ireland in identifying opportunities including:
 - o Better traction with International Financial Institutions (IFIs)³; to date, GI works closely with EI to assist in delivering workshops with the EBRD, WBG, ADB and the EIB, and has the ambition to liaise with the AfDB, and supports Ireland's application to the AfDB.
 - o Participate at Expo 2020 Dubai to promote GI and the Irish skill-set on a global level.
 - o Develop GI's Panel of Experts; the Panel is designed to add expertise in technical areas to supplement Members responses to tenders.
 - o Maintain focus on the end-target: public buyers & large, 'Tier-One' contractors



Pillar 3: Strengthening Geoscience And Growing Its Influence

Goal: To promote and invest in Ireland as being a centre of geoscience excellence.

Geoscience as a sector in Ireland is worth over €3 billion to the economy (Indecon, 2017); this value consolidates a number of aspects and sub-sectors of this highly skilled and technical sector. The sector is supported by national policy; the Government's 2018 Action Plan for Jobs – Ireland's national economic and enterprise policy – included a case study of Geoscience Ireland as an exemplar case study of cluster delivery.

Geoscience R&D is captured in national policy by way of Science Foundation Ireland (SFI) supporting iCRAG which is the first national geoscience research centre. To build on this great progress to date, GI will:

- Support further policy development in Ireland which impacts on geo-related sectors including natural resources, energy and infrastructure development,
- Enhance the Irish geoscience ecosystem by way of continuous engagement with stakeholders – national, public agencies, research institutions and the private sector - with the goal of supporting job growth and economic growth.
- Enhance international exposure and promoting Ireland as a centre of geoscience excellence; this will progress initiatives as outlined throughout this document including:
 - o representation at leading conferences and events
 - o targeting strategic relationships such as NOF Energy and Pole AVENIA
 - o alignment with European cluster policy, and applying for 'Cluster Excellence' status
 - o targeting market research calls such as COSME
- Continue sponsoring the Geoscience Ireland Award at the annual Engineers Ireland Awards which recognises exceptional achievement in design and/or delivery of projects requiring significant geo-scientific expertise.

4. Conclusion

Geoscience Ireland have delivered real and indisputable value in its short existence, having played a key role in revitalising and enhancing a vital sector of the economy, and helping bring it into international markets. This strategy builds on the experience and expertise gained in these last five years, and harnesses the collective energy of the membership base to create sustainable advantage against overseas competition. The intangible assets are now considerable, with a vibrant network, international market knowledge, close connections with key stakeholders, extensive access to clients and business bridgeheads across the globe. Geoscience Ireland is committed to maintaining its mandate and will continue to provide real and substantial assistance to Irish companies as part of the National Action Plan for Jobs.

5. Acknowledgements and Message from Sean Finlay; Director, Geoscience Ireland

The Geoscience Ireland (GI) voyage, first embarked on in the harsh environment following the global economic recession of 2009, has proved to be challenging and rewarding, with several unexpected but favourable outcomes. The formative stages involved the then Director of Geological Survey Ireland (GSI) **Dr Peadar McArdle**, along with senior staff members **Koen Verbruggen**, **Ray Scanlon** and **Taly Hunter-Williams**, all of whom had extensive experience in designing and managing geoscience surveys, projects and research programmes. Enterprise Ireland (EI) was represented by **Neil Kerrigan** and **Dr Paul Butler**, both engineers with extensive experience of innovation and construction.



Sean Finlay, Director, Geoscience Ireland

The original focus of the initial group of five companies, brought together by GSI and EI, was to assess the potential international markets for geoscience services, how to enter markets and to encourage collaboration between companies. **Neary Marketing Consultants** were engaged to undertake this early work, involving the creation of a website, branding and marketing materials. Some of the founding Member Companies had experience in pursuing projects funded by International Financial Institutions (IFIs) and initial marketing efforts focussed on this sector, particularly in relation to Sub Saharan Africa.

It became clear at an early stage that an organisation simply based on quarterly or even monthly meetings involving EI, GSI and the five reference companies involved would not lead to systematic development of a business model. In early 2012 it was decided to hire a full time business development executive, to be funded by GSI. Following a public tender, I was appointed to that role in late 2012.

It was also clear that the range of geoscience skills available in Ireland spanned several sectors and included extractive industries, water and environmental services and infrastructure development. Companies across these sectors joined the network, with a rapid rise in membership in 2013 to 22 and there are now 36 Members.

As the GI cluster expanded, **Dermot Reidy**, Senior Development Advisor with EI's Construction Services Division joined the Steering Committee. An experienced Project Manager with extensive contacts in the construction sector in Ireland and overseas, his role in the growth and development of GI has been pivotal. He provides the linkage to EI's international offices in the UK, the Gulf, Africa, the Balkans, the Nordics, Turkey, North America and Australia. Trade Missions, Inward Buyer Visits and training for GI and its Member Companies have been arranged and often led by Dermot. The support of EI staff in these international offices has been exceptionally effective and uniformly of a high standard.

Eugene Forde and Thomas Murrary of the Department of Business, Enterprise and Innovation (DBEI), the parent organisation for EI, also serve on the GI Steering Committee.

From the outset, GI engaged with the Department of Foreign Affairs and Trade (DFAT) because of its extensive experience with aid programmes in Sub-Saharan Africa. In addition, DFAT's presence in Africa greatly exceeds that of EI. **Sean Hoy** of DFAT was a key contact in the early stages and Irish Embassies and Consular Offices in throughout Africa have greatly assisted GI Member Companies by way of country briefings, introductions, visa matters and on occasion, project interventions. As GI's reach widened to include the Balkans, Turkey, the UK, Canada and the Gulf, this relationship has endured and has been strengthened with the appointment of a DFAT representative to GI's; **Ruth Parkin, Sarah Callanan, Robert O'Driscoll** and **Conor Long** have all served in this role.

The development of business networks is a challenging undertaking. While there are no real models or standard templates available, industry clusters which are common in Europe, are typically supported by public funds over lengthy periods, with private sector contributions growing over time. GSI and its parent, the Department of Communications, Climate Action & Environment (DCCAE) provide most of the funding for GI, with Member Companies contributing an annual fee. In addition, DCCAE/GSI provides administrative support and a location for the GI Secretariat. GSI's Cartography Division continues to provide marketing material. DCCAE Assistant Secretaries **Michael Manley, Brian Carroll** and **Matt Collins** have served as Chairmen of the Steering Committee. This comprehensive support from DCCAE has included political support from successive Ministers, **Pat Rabbitte, Alex White** and **Denis Naughten**, and Ministers of State, **Fergus O'Dowd, Joe McHugh** and **Sean Kyne**.

The interaction between government departments and agencies has been a major contributing factor to the effectiveness of GI and is an exemplar of a "Team Ireland" approach.

GSI support has also enabled GI to recruit three additional staff members for business development, marketing and tender tracking. **Andrew Gaynor**, Business Development Manager, was appointed in

2014; **Elizabeth Murphy** and **Stephen D Walsh** were hired as Market Advisors in 2017. As the focus of GI widened beyond IFI's to include a range of potential clients in sovereigns, public and private sector developers, these additional staff have enabled GI to extend its range of services to include an online tender tracking device ("GIPH") and to engage with a wider audience of trade and professional bodies.

Liaison with third level research and development agencies is a common feature of business clusters. GI participates in the governance of the **Irish Centre for Applied Research in Geoscience (iCrag)** and several GI companies contribute to the research centre. Innovation is at the heart of successful cluster development and GI Members have won several awards for new designs and processes. GI sponsors a Geoscience Award by Engineers Ireland.

Interestingly, only two of the five reference companies forming the GI nucleus are still Members. One went into liquidation; one downsized and one left the network. The two founding Members are SLR (Ireland) Consulting and Tobin Consulting Engineers. The success of the network depends on trust between Members, many of whom are competitors. Trust-building develops by practice in collaborating on projects and by sharing information and insights. I see GI's main task as being a builder of trust and confidence between Members. The experience in this regard has been overwhelmingly positive and it has been singularly rewarding to assist in this work. I am confident that GI Member Companies will continue to support one another and the GI framework.

Given that employment levels in the sector have substantially recovered, the member-focussed Pillars outlined in this Strategic Plan reflect the need for a new direction for GI. Helping Member Companies to build resilience and scale through supply chain mapping, developing company plans, market diversification in a Team Ireland context will be the objectives, ensuring that high level technologically and professionally rewarding jobs are maintained and provided for Ireland's geoscience experts. The services provided by GI companies are transformative for developing and emerging countries and essential for mature economies. Continuing this voyage is our shared vision.

GEOSCIENCE
IRELAND
Exploring
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Geoscience Ireland | Geological Survey Ireland

Beggars Bush, Haddington Road
Dublin D04 K7X4, Ireland

<https://www.geoscience.ie>



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