

CONFIDENTIAL

REPORT OF THE **SFI ADVISORY COMMITTEE ON CENTRE GOVERNANCE**

Submitted by

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REMIT

To provide advice and recommendations to the Director General of SFI on the optimal governance and reporting structure of the SFI Research Centres including:

- The optimal composition of an SFI Research Centre Governance Committee, its means of appointment, terms of reference, representation with (and relationship with) the higher education institutions (HEIs), responsibilities and reporting to SFI.
- How best each SFI Research Governance Committee can inspire and develop (with management) the vision, ambition, strategy and performance of each SFI Research Centre.
- How best the Governance Committee and the SFI Research Centre can regularly report to SFI and their University partners on performance, risks, challenges and opportunities avoiding duplication, and facilitating timely resolution of immediate challenges by the appropriate people.
- How best the SFI Research Centres Governance Committee can align with the constituent HEIs to appropriately influence the research and investment strategies of the HEIs (particularly the host HEI) to ensure adequate support around the strategic ambition of each Centre.
- What subcommittees (e.g. Industry/scientific Advisory) – if any – the Governance Committee should establish and their proposed remit, responsibilities, operation and reporting structure.
- What can we learn from comparable Research Centres in other countries and from industry to improve the SFI Research Centre governance structure.
- Any other matter related to governance of the SFI Research Centres which the Advisory Committee would like to raise.

CONFLICT OF INTEREST

At the first meeting of the advisory committee we recognised that each member of the committee had a potential conflict of interest. Every committee member has an association with both the Centres under discussion as well as the host institution. However, it is also recognised that the fact that members are involved with the Centres makes them well equipped to comment on their governance and to advise SFI how to improve them. Furthermore, the chairman was involved in setting up Tyndall as an institute within UCC. We are aware these facts could influence the conclusions of this report.

ACKNOWLEDGEMENTS

During this study the SFI Advisory Committee on Centre Governance consulted extensively with stakeholders including:

SFI Research Centre Directors

SFI Research Centre Managers

The IUA Council

IoT Presidents engaged with SFI Centres

University VPs and Deans of Research

Higher Education Authority (HEA)

Enterprise Ireland

IDA

Industry partners of SFI Centres

European Research Centres: IMEC (Belgium), CEA LETI (France), Fraunhofer (Germany), VTT (Finland), SINTEF (Norway), GTS(DTI) (Denmark, RI-SP (Sweden), Catapult (UK)

Queen's University Belfast

Additionally, the committee reviewed the comments of each of the International Centre reviews relating to governance.

The inputs and advice from each of these groups as well as a large number of individuals from industry, academia and government, was critical in arriving at the conclusions and recommendations in this report and is greatly appreciated

1. SUMMARY

The Science Foundation Ireland's (SFI) Research Centres are multi-institutional Centres that join industry, academia and government in partnership to build the Irish economy in priority areas, to produce graduates skilled in innovation and to build Centres of research excellence comparable with the best in the world. The SFI Advisory Committee on Centre Governance (called "the Committee" hereafter) heard very strong support for the SFI Centres from all of the various stakeholders interviewed. The current Centres model has been a game changer which has been hugely positive in terms of engaging industry in joint research programmes and leveraging financial support from industry.

The research landscape in Ireland has changed dramatically over the last several years. The Research Centres have, in a relatively short period of time, been a game changer for the Irish ecosystem. The Centres have been hugely positive in terms of impact, engaging with industry, leveraging financial support from industry and other non-Exchequer sources and provide a stimulating environment for students and early career researchers. The SFI Centres should continue to be an integral part of a well-balanced higher education system with Ireland becoming one of the leading innovation nations in Europe. This rapid change has led to some tensions within the system between the researchers, with the Higher Education Institutes (HEIs) and with SFI. While many of the issues encountered at the outset of the creation of SFI Centres are being resolved as time passes, there remain some issues that still need to be resolved for the vision for the Centres to be realised.

The Advisory Committee considers that these improvements can be made with relatively modest actions on the part of SFI, HEIs and Centres.

During this study the committee engaged with a large number of stakeholders (see foregoing list) and received a lot of advice on what needs fixing, and what works well. We believe that in this report we have addressed most, if not all, of those issues.

In this summary, we present selected findings and recommendations in the key areas addressed in the report. More detailed findings and recommendations may be found in the body of the report.

The areas addressed are concerned with the governance and management structure of Centres as charged by SFI. We begin in section 3 with a discussion of the SFI/HEI relationship with respect to Centres and in particular (section 3.1) whether the Centres should be based within the HEIs or whether legally separate institutions are better suited to their missions, as have been established by several European Research and Technology Organisations (RTOs). In section 4 we discuss the Governance Committees themselves, their authority, their membership, and the specific actions required of the committees. In the Appendices, we provide additional information to support the text as well as information concerning the relationships between Centres and Institutes of Technology and between Centres and SMEs, which while they fall outside of the remit of this committee may be important for SFI to consider.

Findings and Recommendations

Findings 3.1a: Currently all SFI Research Centres are hosted within HEIs since graduate student education is an important part of Centre activity and the majority of research strength lies within the HEIs. While there are many benefits of this arrangement, there are also a number of significant disadvantages. Many of the national research Centres in Europe have been established as legally separate entities to serve industry and to help speed research findings to the market place. However, in Ireland, the need to integrate research activities across all research bodies to build ‘critical mass’, to share research facilities and to build graduate education opportunities requires very close partnership between HEIs and SFI Research Centres. The Committee finds that the disadvantages of having the Centres within the HEIs, may be mitigated by appropriate modification of the governance of SFI Centres, and their relationship with the HEIs.

Recommendations 3.1a:

Maintain the current SFI Research Centres within HEIs subject to the significant governance modifications outlined in this report.

Findings 3.1b: The increased level of partnership between SFI Centres and industry is resulting in an increase in the Technology Readiness Level (TRL) of the research which is likely to continue to increase in the foreseeable future. As TRLs increase the skills required, the value systems change, and the commercial business relationships (liabilities/warranties etc) become difficult for HEIs to support and legal separation of high TRL parts of the Centres may become necessary.

Recommendation 3.1b:

As work at higher TRL levels in Centres increases, the creation of legally and financially independent organisations either as RTOs or as start-up companies on an as-needed basis, in very close partnership with the SFI Research Centres, needs consideration.

Findings 3.2: The priorities of SFI Research Centres and their HEI hosts and partners may not always be well aligned. There are often differences in expectations for both parties in terms of resources and services which leads to conflict.

Recommendation 3.2:

More detailed contracts between SFI and the HEIs and two-way service level agreements between the Research Centres and the HEIs should be put in place at the outset, outlining the obligations, commitments and responsibilities of all parties.

Findings 3.3: The overhead level of 30% on SFI was established as an estimate over 15 years ago. This falls well below the full economic costing of research, as recently calculated by the IUA.

Recommendation 3.3:

SFI, in conjunction with the HEA and IUA, should undertake a study of the full economic cost of research and agree to an overhead rate that appropriately reflects the cost of carrying out SFI research.

Findings 4.1a: Currently the Governance Committees have no formal authority to oversee SFI Centre operations. As a result the committees monitor the activities and performance of Centres against the original objectives.

Recommendation 4.1a:

SFI and the HEIs should delegate authority to the Governance Committees to oversee the strategic development and performance of the SFI Centres.

Findings 4.1b: The Centre Director needs to focus on vision, strategy and scientific/technological direction and there is a critical need for senior leadership alongside the Scientific Director who can engage with industry at a senior management/corporate level.

Recommendation 4.1b:

The Centre Manager should be a senior appointment, such as COO/CEO.

Findings 4.1c: The Centre Directors currently have a complex and time consuming administrative and reporting load that takes them away from their research and research management.

Recommendation 4.1c:

SFI should reduce the amount of reporting required of the Centres. While it is appropriate for SFI to collect the KPIs on a 6 monthly basis, the Governance Committees should report on Centre accomplishments on an annual basis.

Findings 4.2: Some SFI Centres have several HEI partners, all of which serve on the Governance Committee.

Recommendation 4.2:

The composition of the Governance Committee should comprise of members largely external to the Centre and HEIs (non-executive and independent) who collectively have broad experience and expertise in areas relevant to the Centre. Appointments should be recommended by the Governance Committee and approved jointly by SFI and the HEI.

Findings 4.3: The Centres derive valuable feedback from the Scientific and industrial Advisory Committees on the quality and value of the research

Recommendation 4.3a:

Scientific and Industrial Advisory Committees should continue to advise the Centre Executive, and provide unfiltered reports to the Governance Committee, on the vision, the strategy and the quality of the research.

Finding 4.3b: The Centres need stronger support for communications with the public, the global scientific community and with industry.

Recommendation 4.3b.

A communications team should be put in place to develop the national and international visibility for the Centres and the marketing materials needed to promote the Centres with industry and others.

Findings 4.4: Currently the Governance Committees see themselves as primarily signing off on the performance of SFI Centres and reporting the progress to SFI.

Recommendation 4.4:

The Governance Committee should help drive the implementation of the vision and the strategy of the Centre to become global leaders in their field of research. The Governance Committee should pay attention to the quality of the partnerships of the Centre with industry (both SMEs and MNCs), with the HEIs and between researchers in the Centre, and provide support for the Centre Director, as necessary. The Governance Committee should help evaluate the communications strategy and disclosure of intellectual property and help identify new potential commercial opportunities. The impact a new funding model (such as migrating the funding mix to 1/3 State, 1/3 industry and 1/3 non-Exchequer funding) needs to be carefully monitored to retain the optimum mix of fundamental research with short and longer term applied research.

Findings A4: The Institutes of Technology (IOTs) provide approximately 10% of the national research effort and help support the economic and social development of the regions. Five of the IoTs are currently involved in SFI Centres. Several issues are faced by IoTs which differ from those of the Universities and these are outlined in Appendix 4.

Recommendations A4:

SFI, HEA and Enterprise Ireland and IDA should consider how to further optimise the inclusion of IoTs in the national research agenda. Better streamlining and coordination between Technology Centres, Technology Gateways and SFI Centres is needed – especially as the Research Centres move toward higher TRLs.

Finding A5: Partnership between Small and Medium sized Enterprises (SMEs) with Centre researchers can be very valuable in building the competitiveness of early stage companies. However, SMEs do not have a good understanding of how partnership with SFI Centres works, the rules of engagement, the rules for intellectual property and how to get a fair deal. The Centres do not always spend the time engaging with SMEs because the level of SME funding is small or because of poor interest match or absorptive capacity of the SME.

Recommendation A.5

SFI should prepare, together with the HEIs, an information document on “guidelines for SME/Centre collaborations” which explains the rules of engagement for SMEs to partner with Centres and clarifying what SFI requires, and how best to negotiate agreements with the Centres and HEIs.

Concluding Comments

The Advisory Committee believes that huge progress has been made by the SFI Centres in building a culture of partnership between researchers and industry, and between the researchers in different HEIs. This focus on national strength will enhance Ireland’s reputation around the world as an innovation leader.

The committee considers that further progress can be achieved by endowing the Centres with a greater level of independence which in turn builds entrepreneurial spirit. This, in turn, will benefit the HEIs with a more dynamic research culture without reducing the commitment to the education mission. The steps recommended in this report to modify the governance of Centres can be made with relatively modest changes to the current approach, yet will reap significant benefit.

The Committee considers that, as the commitment to industry partnership and economic growth increases, some parts of the SFI Research Centres will continue to move toward higher TRLs which will be increasingly difficult for HEIs to manage within the existing framework. A creative new approach to creating new legally independent RTOs out of the high TRL parts of the SFI Centres, yet remaining very closely coupled to their Centre parents, will likely become necessary.

2. INTRODUCTION

During all of our discussions with stakeholders, there was universal agreement that the SFI Research Centres have succeeded in integrating research strengths across Ireland to create Centres of critical mass in priority research areas of importance to the economic growth and social development of Ireland. The Centres have created a culture of partnership in which fundamental scientific research and applied engineering research are building on each other to bring meaningful value to Irish industry and other stakeholders, such as government departments and public policy makers. Strengthening industry's engagement with research will be important for the future development of Irish Industry. At the same time, these Centres are attracting the attention of the international research community and building Ireland's reputation as a site for world class research.

This transition has been rapid. The focus on international excellence with economic impact has required considerable change in our research institutions and these changes are still in progress. The Higher Education Institutes (HEIs)* are adapting to hosting these large scale, multi-partner Centres where the agendas are different. However, we have found that there are still challenges to address in the relationships between the HEIs and the SFI Centres with this evolving mission. In this report we address a number of issues where we consider that change in the current governance structure will improve the relationships, speed the decision making processes for industry-HEI agreements and increase the level of entrepreneurial spirit.

**In this document we use the term HEI to refer equally to Universities and Institutes of Technology (IoTs). We recognise, however, that IoT faculty carry a greater teaching load than university faculty, and the IoTs receive no core research grant from the HEA, so SFI needs to adapt their funding policies for high quality IoT proposals. See Appendix 4 for more discussion on IoTs.*

There remains a body of researchers that believe that industry engagement deprives researchers of independent scientific pursuit and that scientific excellence is diminished as a result. This committee believes that, provided SFI continues to fund high quality individual Principle Investigator (PI) programs within the research ecosystem, these Centres and their close relationships to industry offer Ireland the potential not only for supporting world class science but also for being a leading nation in driving research rapidly to market.

In section 3 of this report, we address the relationship between SFI, the SFI Research Centres and the HEIs and how this may be improved. In section 4, we discuss the governance structure of the SFI Centres and how to mitigate tensions in the SFI Centre-HEI relationship

Many of the well-known Research Centres in Europe were established as legally independent Centres, funded by the government (or government agency) with close relationships to industry, and with varying degrees of partnership with universities and other HEIs, so we first examine whether SFI Centres would best continue to be contained within the HEIs or whether independent operation would be more appropriate in the Irish context.

3. SFI CENTRE- HEI RELATIONSHIP

3a. The current situation

When SFI was created, the decision was made to make all SFI research investments within the HEIs, since the graduate student education would be an important part of research activities, the majority of research staff and facilities were in the HEIs and administrative overhead could be shared.

With the development of SFI Centres and the increased focus on national strengths and industry partnerships, the Committee considered the positive and negative aspects of this arrangement:

Positive:

SFI Centres are staffed by world class researchers across a broad range of disciplines all of whom are currently employed in the HEIs and their salaries are generally, but not in all cases, paid by the HEIs (through a block grant from the HEA). New researchers may be employed with faculty positions, as well as Centre positions. While teaching is not a requirement in SFI Centres, the option to teach provides researchers with a variety of career paths and is helpful in recruiting students into the Centres. In addition, the SFI Centres have an important role in helping influence and inform the teaching and learning within the HEIs thereby raising overall standards. The graduating students and post-docs are a major benefit to Ireland and to companies partnering with the Centres. Recruitment into academic posts can be more attractive for leading researchers as HEIs are larger scale and stable. Centres are more readily started and shut down within the larger HEI framework.

HEI reputations are enhanced by high quality Centre research and international rankings are improved by Centre reputations, publications and technology transfer to industry partners.

Centres have access to facilities and equipment in which the State and HEIs have invested in and, in many cases, supported by HEI-funded technical staff.

Administration (finance, HR, accommodation, IP management) can be shared between HEIs and Centres to get the benefits of scale and reduce cost.

Negative:

The priorities and values of the HEIs and Centres may not always be well aligned. HEIs have many other investments and research activities which compete for hiring and administration focus. The potential loss of faculty teaching and academic administration to Research Centres can be a source of tension within the HEI schools and departments. Alternately, when a Centre researcher wins an H2020 award in the HEI, that may become their primary focus rather than the SFI Centre unless this is well aligned with the Centre strategy.

Engagement with industry, and the economic impact of the research are important functions of the SFI Centres and this may be given a different level of priority by the HEIs - which may be reflected in the type of researchers they hire.

Since the HEIs are the legal employers of the PIs, career progression, performance evaluation, promotions and salary treatment are determined by HEI metrics and this may create conflicts for the Centre researchers.

Under the National Intellectual Property (IP) Framework, IP is generally owned by the HEIs and their Legal and Technology-Transfer Offices manage the contracts with industry partners. This can lead to slow and inefficient response to industry agreements. Furthermore, supporting industry roadmaps involves extensive involvement in private company product development and HEIs are often unable to adequately protect this.

The entrepreneurial spirit of Centre staff is an essential component of new business creation and seizing opportunities as they arise. Centre Directors and managers need to be responsible for making things happen without the impedance of a large bureaucracy.

Centres consist of researchers from multiple HEIs that may not have the same rules and regulations with respect to business and IP agreements. Each needs to sign off on decisions made by the Centre Director. Differences in HEI policies may result in different policies for researchers working on the same project! In addition, branding of Centres on the international stage becomes increasingly difficult with multiple HEIs.

Centres cannot act as a single entity when bidding for H2020 and other programmes.

3b. SHOULD CENTRES BE LEGALLY INDEPENDENT ENTITIES?

It is evident from the last section that much is to be gained by having Centres situated within the HEIs and that a very close, supportive working relationship should be maintained. It would appear that most of the disadvantages listed could be mitigated by appropriate modification of the governance structure of the Centres within the HEIs – yielding the required level of independence and support for effective operation of the Centres – while maintaining the advantages of close HEI partnership. This is examined in the current section.

In terms of considering how separate legal research entities work, some benchmarking of RTOs in Europe was carried out. Most of the European Research and Technology Organisations (RTOs) studied by the committee, have been established as separate legal entities – some over 50 years ago, - to bridge the technology gap between industry and academia. These are singular entities often made up of smaller institutes of varying expertise which allows their representation as a much larger entity – allowing, for instance, for lobbying government as one voice. For example, total employment numbers range from over 23,000 in the Fraunhofer Gesellschaft (Germany) to 2000-2500 in IMEC (Belgium), VTT (Finland) and Sintef (Norway). These RTOs play a critical role in the economies of Europe and have long term State support with no envisaged sunset. The RTOs operate in parallel with conventional academic Centres but with much greater focus on higher Technology Readiness Levels (TRLs),* and less focus on PhD training and traditional academic metrics. They have their own campuses and universities may have their own buildings on campus and faculty may be employed by the RTO as adjunct to universities or vice-versa. All of the RTOs have some level of sustained government funding based on continued successful performance. RTOs are expected to remain relevant to industry needs and viable. Each RTO has a governing board and KPIs are established by the RTOs with only a light touch by the funding agencies.

Much of the research in SFI Centres at present is in the lower TRLs, characteristic of university research but there is an increasing trend toward the higher TRLs needed for effective industry partnership, such as new product development and delivery of early prototypes. At low TRL levels, there is no compelling case to create more independent institutes in Ireland given the already large number of research institutes for a small population. Indeed, rather than further fragmentation of the national research effort, a level of consolidation, and sharing of capabilities, such as that currently underway with HEI partnerships in SFI Centres is more appropriate. SFI Centres should be an integral part of a well-balanced higher education system.

**See Appendix 1 for TRL.*

The SFI Centres span a range of TRLs which is broad compared with academic research bodies in other countries. The Committee considers that this is a good trend since the close coupling, and co-location, of fundamental research to product development results in cross-pollination of ideas with the fundamental research being an essential part of new device development and applied work stimulating new fundamental research. However, as TRL levels increase, the skills required, the metrics and value systems become increasingly different. Furthermore, the delivery of product prototypes leads to a commercial business relationship that becomes very hard for HEIs to support, in part because of liability and warranty issues. At this point legal separation of this type of research may become necessary. The current approach in Ireland is to create a start-up at this point. In some cases, this may be premature, and/or the separation of the activity from the Centre may be detrimental for both the Centre and the emerging business. An alternative approach is for part of the SFI Centre to create a legally, and financially, separate entity from the high TRL part of the Centre, (similar to a European RTO), which maintains a very close relationship with the Centre (preferably co-located), shares the facilities, as needed, and has a free flow of researchers between the Centre and the emerging business. Researchers do not have to make a career decision - of leaving the Centre to join the business and support from the entire research organisation is accessible. Staff are hired into the business as the revenues increase, and large initial investments are not always required. Start-up companies can be spun out from the RTO at a later stage when revenues and customers are in place.

Recommendation 3.1:

- a. Maintain the current SFI Research Centres within the HEIs subject to the significant governance modifications outlined in this report.**
- b. As work at higher TRL levels in Centres increases, consider part of the Centres becoming a legally and financially independent organisation either as RTOs or start-up companies on an as-needed basis, while maintaining a very close partnership with the main SFI Research Centres.**

3c. SFI RESEARCH CENTRE – HEI RELATIONSHIP

Many of the disadvantages of having Research Centres within the HEIs cited above may be mitigated by putting in place a clear set of expectations for the reporting structure and the management of Centres at the outset. It should be recognised that SFI Centres are created to serve a national purpose, usually with several HEIs as partners and they generally require a different management structure from other HEI Centres. The Committee recommends that a modified contract be signed by the HEIs and SFI outlining the expected policies and procedures for hosting an SFI Centre and the support that can be expected from SFI, the Host Institute and the other partners HEIs. In addition to the contract, there should be a service level agreement (SLA) signed by both the HEIs and the SFI Centres describing the responsibilities of both parties for the duration of the Centre. These agreements should include the following (a more complete list is given in Appendices 2 and 3):

1. The reporting relationship: The SFI Centre should continue to report to the most senior position of the host organisation (i.e. the HEI President or Institute CEO) and not into a Department or School, in order to minimise unnecessary roadblocks and delays. Indeed, to emphasise the national status of SFI Centres and their alignment with HEI strategy, it may be appropriate in some cases to designate them as Research Institutes within the governance structures of the HEIs. Of course, individual PIs in the Centre will still report to their host Department Heads in the HEI.
2. Both SFI and the HEIs should delegate responsibility for the oversight of strategy to the Governance Committees.
3. The Governance Committee should report to SFI and the host HEI President.
4. The Centre Directors should be represented on the relevant policy-making committees of the HEIs for resource allocation (i.e hiring and accommodation).
5. The Legal Departments and Technology Transfer Offices should have an identified person responsible for managing Centre relationships with industry. These offices should have clear expectations concerning policies

and speed of response. When there are multiple HEI partners, these offices should have clear guidelines (based on standard templates) for managing the relationship with the other HEI offices, and not leave this to the industry partners. Industry should have a single point of contact with Centres and not have to deal with multiple organisations' Legal Departments and TTOs.

6. There should be a consistent policy regarding the branding of SFI Centres, given the multiplicity of institutions involved with Centres (several HEIs, the Centres and SFI). The Committee considers that the primary brand should be the Centre name which should aim to become recognised globally. SFI and HEI hosts and partners should be recognised on publications, press releases and presentation bylines.
7. Responsibility of PIs to the Centre and the HEIs, including teaching responsibilities.
8. Responsibility for hiring and for redundancy payments.
9. Responsibility for equipment maintenance, technicians' salaries, recruitment and advertising costs and animal facility costs, where appropriate.
10. Accommodation requirements
11. Clarity on overhead (see below).

During the establishment of the Tyndall National Institute an agreement was put in place between the Department of Enterprise, Trade and Employment and University College Cork. This was updated by the Department of Jobs, Enterprise and Innovation. In addition, a service level agreement (SLA) was put in place between UCC and Tyndall. Both of these documents may be available for reference.

Recommendation 3.2:

More detailed contracts between SFI and the HEIs and a Service Level Agreement should be put in place between the Research Centres and the HEIs at the outset outlining all of the obligations, commitments and responsibilities of all parties.

3d: OVERHEAD

At the beginning of SFI over 15 years ago, the accounting procedures in the HEIs were not capable of clearly identifying the full cost of carrying out research. An overhead rate of 30% was established to cover the estimated *incremental* cost to the HEIs of hosting SFI researchers. The HEIs were expected to provide an accounting of how the overhead was spent to cover the indirect cost. It was recognised that this 30% was below *full economic* cost of carrying out research, but that in due course the proper overhead rate would be established.

Fifteen years later this overhead rate of 30% remains the same. In the meantime, the core grants from HEA to the HEIs has considerably decreased, resulting in considerable stress on HEI finances. The accounting systems of HEIs has improved considerably and full economic costing data have now been tabulated by the Irish Universities Association (IUA).

The Committee considers that it is time to have a new look at the whole issue of research overhead – both what is the full economic cost of research in the HEIs (and this may differ from one HEI to another) and also what expenses should be considered as overhead and what expenses should be considered as direct cost. All State funding of HEIs, including SFI funds and HEA funds, should be taken into account, along with the commitments of the HEIs to the Centre such as Director and Principal Investigator costs. It would be appropriate for SFI to consult with funding agencies in other jurisdictions that have addressed this issue in greater detail.

At the present time, some Universities (but not all) give an additional budget to the SFI Centres sometimes incorrectly referred to as “return on overhead”. This may be important in giving Centre Staff some flexibility in allocating funds to projects. This practice needs to be clarified.

The Committee understands that any increase in overhead allocations will reduce the overall funding for research unless the overall budget for research is increased at the national level. Nevertheless, the Committee considers that agreement on this issue between SFI, HEA and the HEIs is critically important.

Recommendation 3.3:

SFI, in conjunction with the HEA and IUA, should undertake a study of the full economic cost of research and agree to an overhead rate that appropriately reflects the cost of carrying out SFI research.

4. GOVERNANCE

The creation of SFI Research Centres is a competitive process conducted by SFI, based on proposals from HEIs and involving a group of PIs. These proposals outline, in considerable detail, the personnel and budget requirements, the various academic and industrial research partnerships, the overall strategy, the details of the research programme and the benefits of teaching and learning in the HEIs. Of course, prior to the award of a Centre grant, no Governance Committee is involved in this process. At the time the Governance Committee is appointed most of the direction of the Centre is already established. As a result, the Governance Committees, to date, have to a large extent just monitored the activities and performance of the Centre against the original objectives and against the criteria utilised by SFI. The Governance Committees are generally advocates of the programme so their reports to SFI usually emphasise the positive accomplishments. There may be a concern that, any negative remarks in the report could have adverse consequences for the Centre.

To be truly effective, the Governance Committees should act more as governing bodies, with full authority to oversee the strategy of the Centre and to help the Management Executive steer the Centre to the successful outcome desired by SFI and other stakeholders. Fiscal responsibility should remain with the HEIs, but should be monitored and reported on by the Governance Committee.

SFI is very clear about what it expects from the Centres. As guardians of the Exchequer's investments SFI needs to be both the funder and the performance auditor and keep an ongoing and up-to-date record of the KPIs it needs - which is currently in place. However, SFI needs to trust the Governance Committee to oversee the Centre operations to achieve the best results – correcting any deficiencies, modifying the strategy, managing the risks, and reporting back to SFI, on an annual basis, on the realization of the Centre's vision and the Centre's

accomplishments. The Governance Committee may also introduce additional KPIs (which may vary considerably for research at different TRL levels) beyond those required by SFI in order to monitor certain behaviours. Both SFI and the HEIs need to delegate the appropriate authority to the Governance Committee for it to be effective in this role.

The issue of whether Research Centres should have their own PIC number was raised by the Centre Directors. The PIC number represents the capability for the Centre to bid for European projects in their own name. If legally feasible, this would be appropriate for Centres of national character, rather than bidding through the individual HEIs. The options should be explored by SFI.

The current reporting system is too onerous and should be reduced. The Centres have an exceptionally large amount of administration which takes the best researchers away from the laboratories. Some of this is unavoidable – such as managing relationships with current and potential industry partners, preparation for Scientific and Industrial Advisory Committees, applying for EU grants and managing all the reviews and meetings expected by the various funders. All this in addition to the day to day management of the Centre, writing publications, attending conferences and enhancing the national and international reputations of the Centre! All this may result in Centre Directors who are unable or reluctant to take on additional tasks which would benefit the Centre.

Clearly some of these tasks can be handled by the Centre Manager. The Centre Manager is the single most important member of the Centre from the perspective of industry partners. Because of the importance of this position this Committee considers that the Centre Manager should be a senior appointment, such as Chief Operating Officer or General Manager and not just a staff position in the Centre. In such a position the Centre Manager can more effectively interact with senior levels of industry. This is already the case in some Centres.

Recommendation 4.1:

- a) The day-to-day management and strategic development of the Centre is the responsibility of the Management Executive Committee with the Governance Committee providing ongoing oversight of operations.**

- b) **The Centre Manager should be a senior appointment, such as CEO/COO.**
- c) **SFI should reduce the amount of reporting required of the Centres. While it is appropriate to collect the KPIs on a 6 monthly basis, the Governance Committees should be expected to drive the performance of the Centre and report on an annual basis to SFI (instead of two reports per year).**

4a. Governance Committee appointment and composition:

The governance committee members should collectively have (a) management experience (b) knowledge of the subject matter and preferably some personal research in the field, (c) a senior position within the HEI host (d) senior manager with significant industry experience (e) senior government experience and (f) international representation. This would provide the collective skills necessary to guide the Centre Executive in all aspects of strategy and relationships with key stakeholders.

Given that a Centre may have several HEIs as partners, it is not desirable to overwhelm the Governance Committee with multiple senior HEI members. Accordingly we would recommend representation of only the host HEI, at the VP of research level (and possibly one other HEI VPs of research on a rotating basis). It is the responsibility of this VP of Research to communicate with VPs from the partner HEIs to inform and coordinate the HEIs behind the Centre.

Under no circumstances should a Centre PI or a PI from another Centre be represented on the Governance Committee, regardless of their position within an HEI.

The Committee should be nominated by the Centre Executive in conjunction with the President of the host/partner HEIs and the Chair of the Governance Committee, and the appointment should be made jointly by SFI and the Host HEI. It is most important that the Governance Committees have a majority of members who are non-executive and independent of both the research Centre and the HEI partners.

Recommendation 4.2: The composition of the Governance Committee should comprise of members largely external to the Centres and HEIs (non-executive and independent) who have broad experience and expertise in areas relevant to

the Centre. Appointments should be recommended by the Governance Committee and approved jointly by SFI and the host HEI.

4b. Advisory Committees:

The Scientific and Industrial Advisory Committees are very important to the Centres. The Scientific Advisory Committee should consist of leading international researchers in the subject area of the Centre. Members of these committees will be important in building the reputation of the Centres globally. The Scientific Advisory Committees should deliver their unfiltered report both to the Centre Executive and the Governance Committee and the Governance Committee should oversee the implementation of any recommendations made by the Scientific Advisory Committee.

There are three approaches to getting valuable feedback from industry partners. The first is to get a very brief report card from a management level person (not participating researcher) in each industry partner. This report card should indicate whether the Centre delivered on expectations and the value of the partnership. The second is for each Centre to hold an “industry day” in which all industry partners and potential partners are invited to hear presentations from Centre researchers, and finally a group of partners (or potential partners) should be convened to discuss Centre strategy and areas of research that they would like to see expanded/decreased. Since much of the Spoke work in industry partnerships contains industry confidential information, discussion of individual projects is often not possible in a group.

The industry feedback should be shared with the Governance Committee.

The Scientific and Industrial Advisory Committees should be nominated by the Centre Executive, and appointed by the Governance Committee. Membership should be reviewed periodically as the expertise and focus of the Centre expands. It may be appropriate for a member of each of the Scientific and Industrial Advisory Committees to serve on the Governance Committee.

An activity which needs improving in most Centres is communications. Most Centres need support in highlighting their success stories, issuing press releases that the public can understand and appreciate, and publishing in the global trade press to broaden the reputation of the Centre. This may be a function best carried

out by a single person - perhaps even within SFI, to help the individual Centres. This person is also responsible for the development of marketing materials needed by the IDA to attract inward investment, and to develop the national 'story' in conjunction with complementary activities in Ireland. The Photonics Ireland and Therapeutics Ireland initiatives are good examples of coherent national activity. The communications function needs to be overseen by each Governance Committee. All communications should be shared with the HEIs and with SFI.

Recommendations 4.3a:

Scientific and Industry Advisory Committees should continue to advise the Centre Executive (and provide an unfiltered report to the Governance Committee) on the vision, the strategy and the quality of the research.

Recommendations 4.3b:

A communications person should be put in place to help develop the communications, national and international visibility for the Centre, and the marketing materials needed to promote the Centre with industry and others.

4c. Expectations of the Governance Committee:

There is a strong view that Governance Committees should help focus and drive the Centre strategy toward the desired goals. They should:

(a) Advise the Centre Executive on issues such as research partnership (i.e. is the Centre effectively managing the partnerships and resources to create a whole greater than the sum of the parts)? Are the relevant HEIs working in true partnership? Is the partnership with industry effective?

(b) Is the vision and are the goals sufficiently ambitious to make the Centre globally competitive or even the best in the world? The Science Advisory Committee should give an unfiltered report to the Governance Committee on this issue.

(c) Is the Centre getting the appropriate international visibility – presenting at the leading conferences, publishing in the highest impact journals, nominating Centre

researchers for international awards, fellowships and memberships of professional societies/organisations?

(d) Determine that the terms of the SFI/HEI/Centre agreements are being met, and, if not, discuss this with the HEI President(s).

(e) The Governance Committee members should meet on occasion with industry partners to determine whether the Centre is responding adequately to industry needs.

(f) Is the Centre driving potential commercial opportunities (patents/start-ups)?

(g) Are the applications for additional research grants consistent with the Centre's Strategic Plan? Is the Centre targeting funding for new/emerging opportunities?

Because of the experience and seniority of the Governance Committee, it is incumbent on them to advocate for the Centre, and to alert the Centre Executive to new opportunities and industry partnerships.

The management of SFI Centres involves managing a set of complex relationships and conflicts that the Governance Committees need to be aware of and to monitor. The following issues were raised as obstacles to partnership in our consultations:

The primary loyalty of most PIs is to their host HEIs, which is their long term employer, which pays their salaries and where their career path lies. Their loyalty with the Centre arises because of their colleagues with similar interests and because the Centre is a source of funds. Since budgets are established in the application process at the beginning of the Centre, these tend to be considered entitlements by the PIs and changing those budgets, particularly in partner HEIs, can lead to conflict. This entitlement may lead to lack of teamwork between PIs. Since budget control is one of the most important hooks of leadership, the Centre Director should have a separate budget to encourage strong teamwork across the Centre.

There is potential conflict for the HEI's Departments and Schools, which may have differing priorities to the Centres as far as accommodation allocation and hiring is concerned. A Centre cannot be successful if it is handicapped in adding key

personnel to the Centre. There needs to be a formal process for resource management and this should be governed by the Service Level Agreement.

The SFI requirement that Centres raise money from industry and from H2020 tends to drive opportunity rather than strategy. This needs further discussion given the emerging funding models and the need for Centres to draw down substantial H2020 funding.

If feasible, it is generally more attractive to work with Multinational Corporations (MNCs) because they can afford to contribute larger sums to the Centre and they have the legal teams to navigate agreements with multiple HEIs. Consequently, it is harder for SMEs to attract the attention of PIs and due to the small scale of many Irish SMEs, they can find it challenging to put the management time into this research partnership. See Appendix 5 for feedback from SMEs.

It is likely that the above issues will be exacerbated should SFI set a requirement that all Centres migrate towards a funding mix of 1/3 State funds, 1/3 industry and 1/3 non-Exchequer other. Unintended consequences may result in a reduction in graduate student numbers in favour of staff compatible with industry project timeframes and, a reduction in more basic research and publication. This is indeed the case in the European RTOs studied. While well-established SFI Centres in certain sectors have been able to achieve this funding mix, the Committee would caution against uniform implementation of this requirement. It is reasonable to challenge Centres to migrate towards this balance, but with flexibility and recognition of different stages of maturity of the various sectors.

The Governance Committees need to monitor all these, and other, conflicts and help the Centre Directors navigate them in the appropriate manner and work with the HEIs. Management training and ongoing continuing professional development of the Director and all senior staff is desirable.

With the level of responsibility for the Governance Committee indicated in this section, it is expected that quarterly Governance Committee meetings would be needed to address issues on a timely basis.

Recommendation 4.4: The Governance Committee should help drive implementation of the vision and strategy of the Centres to become global

leaders in their field of research. The Governance Committee should pay attention to the quality of partnerships of the Centre with industry (both SMEs and MNCs) with the HEIs and between researchers in the Centre and provide support for the Centre Director, as necessary. The Governance Committee should monitor the communications strategy and help identify commercial opportunities and the capture of intellectual property - such as ensuring inventions are appropriately disclosed. The impact of migrating the funding mix to 1/3 State, 1/3 industry and 1/3 non-Exchequer needs to be carefully monitored to ensure the optimum mix of fundamental research and near term and long term applied research. This needs some flexibility in approach.

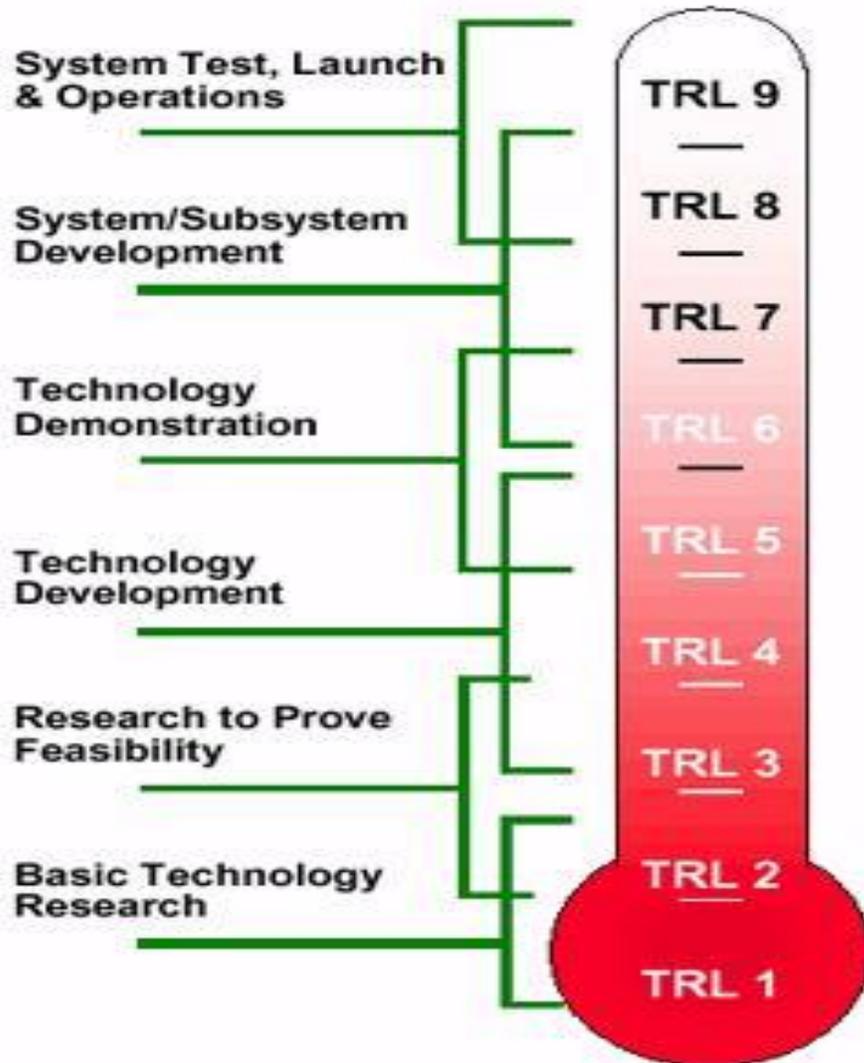
5. OTHER ISSUES:

It should be noted that throughout this document we have emphasised Centre-industry partnership with the expectation that industry is the primary customer for the research. In some fields, such as health and environmental research the government, government agencies, the EU Commission and international bodies and the public itself may be the primary beneficiary of the research. The absence of a strong research culture in the Health Service Executive presents a challenge to health related research and needs to be addressed. This issue may become more important for such research Centres to meet industry co-fund requirements.

APPENDIX 1

Technology Readiness Level

(source: Wikipedia)



APPENDIX 2

Contract between SFI and HEIs

An agreement between SFI and the HEIs hosting or partnering in an SFI Centre needs to be signed by all parties. The agreement should include:

- a) Acceptance of the grant
- b) Use of funding specified by SFI
- c) Level of overhead
- d) National focus of Centre
- e) Goal of global excellence
- f) Centre Director reports to the Host Institute CEO or President
- g) Establishment of a Governance Committee and appropriate delegation of authority to the Governance Committee to oversee operations.
- h) Membership, appointment, term of office, and functions of the Governance Committee
- i) Strategic Plan – produced and updated by Centre Director
- j) Identify a single point of contact for Centre agreements with industry
- k) Warranties and Liability
- l) Agreement contingent on establishing a Service Level Agreement between the HEI and the SFI Centre (see Appendix 3)

APPENDIX 3

Service Level Agreement

The agreement between SFI and the HEIs should be contingent on a Service Level Agreement between the HEIs and the SFI Centre. This agreement must be a detailed summary of all services and support to be provided by the HEIs to the Centre and by the Centre to the HEIs in each of the following areas:

- a) Office of the Bursar/Chief Financial Officer – Accounts payable, procurement, payroll.
- b) Office of Human Resources – incl. hiring of researchers and staff, performance review.
- c) Office of Building and estates – incl. accommodation for the Centre, security, facilities, operation and maintenance.
- d) Office of the Vice President of Research - incl. Technology Transfer Office.
- e) Office of Corporate and Legal Affairs – incl. commercial agreements, risk analysis.
- f) Engagement of the Centres and researchers in the academic mission of the HEIs – incl. teaching, learning and administration.
- g) Postgraduate and related services – incl. student supervision.
- h) Health and Safety.
- i) Branding and events.
- j) Reviews and reporting.
- k) Library services.

In each category the person responsible for the service in the HEIs or in the Centre should be specified.

These SLAs have been put in place between DJEI, UCC and Tyndall and may be available for guidance.

APPENDIX 4

Institutes of Technology and Science Foundation Ireland

This appendix addresses issues faced by IoTs that are not directly related to the remit of the Advisory Committee on SFI Centres. However, the committee considers these issues to be important for the overall research climate in Ireland.

The Institutes of Technology (IoT) play important roles in the Higher Education sector, mainly in the teaching and learning they provide, but they also provide approximately 10% of the national research effort. IoT's are distributed regionally throughout the country and they help support the economic and social development of the regions. Five Institutes of Technology (Dublin, Cork, Waterford, Dundalk and Athlone) participate, as partners, in SFI Research Centres and they all have ambitions to increase their research output and quality.

Some of the issues faced by IoT's are different to Universities so, in this Appendix, the Committee makes specific recommendations for improving the research in IoT's.

1. Research in IoT's

- SFI, HEA and the IoT's should together address what is expected of IoT's in relation to research and consider setting a target for high quality, internationally competitive research. This will become increasingly important as research in SFI Centres move toward higher TRL levels. Research and research-informed teaching are core parts of the IoT mission and there needs to be an appropriate balance between teaching and research in IoT's.

Impediments to achieving high quality research should be addressed. Examples include the following:

- Contracts of IoT staff need to be more flexible, more focussed on outputs as opposed to inputs and be somewhat more relaxed in the constraints imposed on staff.
- IoTs receive no core grant for research from the HEA.

- SFI could support more research by IoT staff if there was SFI funding to help buy out some of the teaching time, in the form of provision of research fellowships.
- A proactive approach towards development of a new workload model, that meets the teaching requirement of the sector and accommodates its research ambitions, is required for IoT's, along with an appropriate university-type career framework for staff in the IoT sector.
- IoT's should have access to electronic libraries, similar to universities.
- The national system of PhD education is moving towards structured provision and IoT's are adopting this approach. This could be more streamlined and allow PhD students to choose from programmes across the country and gain relevant credits so that they end up with gaining experience across different HEI's.
- There is a need to look at the performance measurements utilised in IoT's (which often tend to be quite simplistic) and to relate them more to outputs.

2. Participation by IoT's in SFI Centres

- SFI should consider mapping the various strengths in research and applied research going on in all HEI's and seeing if they could facilitate more collaboration between relevant HEI's, including IoT's, where suitable linkages are identified.
- The IoT's should be included in the branding of SFI Centres in which they are partners. It would help if the term utilised by SFI was "Higher Education Institute" (HEI) and not "university," unless the reference is specifically directed at the university sector.
- Because of the under-investment in research within the IoT sector, it is recommended that SFI might consider holding a specific call for IoT's, to increase the footprint of IoT involvement with SFI Centres and to help build capacity for the SFI Centres of the future. Funding should only be allocated where excellence with impact would be the likely outcome over the agreed period of the programme.
- Transdisciplinary research within and across HEI's is growing in importance and this should be specifically supported in SFI calls.
- SFI should provide IoT's with support structures for applying for EU funding and also Technology Transfer Offices, similar to the facilities available to universities.

- IoT's should be eligible to apply for SFI Research Professorships contingent on the same requirements for excellence.
- IoT's should be eligible to apply for the 500 PhD positions being proposed by SFI. The decisions should be based on merit only.

3. Governance of Centre and involvement of IoT's

- IoT researchers in SFI Centres should be involved (like all others) in the normal management structures of the Centres, including any Management Committees
- IoT's that partake in any SFI Centre should also be provided with the same opportunity as other HEI's to nominate an appropriate person to the Governance Committee,

4. Addressing the Technology Readiness Levels (TRL's)

- Many IoT's tend to focus more on higher TRL's than the universities do and they often do that with support from Enterprise Ireland (EI) and the IDA, through The Gateways and Technology Centres. Generally, EI only fund business development and the Technology Centres do not fund research, per se but they rely upon grants received. Technology Gateways provide access to a technology activity in which the Institute is working. Better streamlining and coordination between Technology Centres, Technology Gateways and SFI Research Centres is needed.

Recommendation A4:

SFI, HEA, Enterprise Ireland and IDA should consider how to further optimise the inclusion of IoTs in the National Research agenda. Better streamlining and coordination between Technology Centres, Technology Gateways and SFI Research Centres is needed – especially as the Research Centres move toward higher TRLs.

APPENDIX 5

Feedback from SMEs

The following is feedback from SMEs than does not relate to Governance, but may be useful to SFI.

SMEs reported very varied experiences working with SFI research Centres. Some are very satisfied with their interactions, but here we report the negative feedback received by the committee.

Many SMEs do not have a good understanding of how partnership with Centres works, the rules of engagement, the rules for intellectual property (IP), nor how to make best use of the system and how to get a fair deal at the outset. The Centres themselves do not always give good guidance or spend the time engaging, especially if the SME interests do not match those of the researchers.

It can be difficult and time consuming to negotiate IP with multiple HEIs having different rules and approaches and have to negotiate this before any IP exists.

The cost of engagement is high for SME and cash up-front can be a serious issue. There does not seem to be any standard approach to these agreements. Some SMEs are asked to pay a large fraction of the cost (40% in one case) with no rights to the IP. The system seems inflexible.

Given the importance of research support for SMEs in the early stages of their development there needs to be some incentive for Research Centres to work with SMEs. Typically, the level of industry income from SMEs is much smaller than that from MNCs and is, by itself not a great incentive.

Recommendation A5:

SFI should prepare an information document - “guidelines for SME/Centre collaborations” explaining the rules of engagement and clarifying what SFI requires, and how best to negotiate the agreements with little specialty knowledge.