

Belfast Region City Deal

Innovation and Inclusive Growth for Northern Ireland

INNOVATION
FOR REAL
WORLD IMPACT

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QUEEN'S
UNIVERSITY
BELFAST



Overview

- Context for City Deals – why do we need them?
- What is a City Deal anyways?
- What does this mean for Queen's?
- What we are doing and what it means for early career researchers

Our Ambition

- Deliver inclusive growth benefits for the Belfast Region and NI more widely – productivity, jobs and skills
- Create sustainable City Deal Centres that stimulate and grow effective industry-academia-community partnerships
- Align University capabilities, forward planning and wider funding opportunities to leverage maximum benefits for Northern Ireland, Queen's and BRCD City Deal Centres

Transformation: NI Challenges



NI has the lowest productivity levels of any UK region – ranking around 18% below the average UK level (DfE, 2019)



NI's economic inactivity rate has been the highest of the UK regions for past 30+ years. (27.2% v 21.7% in 2018, NISRA)



1 in 6 adults in Northern Ireland have no qualifications (16%), less than one in ten in England, Wales and Scotland. (Joseph Rowntree Foundation, 2018)



20% of NI's population live in poverty (Joseph Rowntree Foundation, 2018)



Approximately a fifth (19%) of all jobs in NI in 2020-21 were 'low-paid' (based on OECD measure of low pay). This is the highest proportion of the 12 UK regions. (DfE)



Low levels of capital investment have resulted in significant deficiencies in infrastructure (NIE Draft Investment Strategy, Jan 2022)

10X Economy: NI's Decade of Innovation



- An ambition for a tenfold increase in innovation over the next ten years which has benefits for all its people
- Measured by innovation-led economic growth, inclusive growth, and green growth
- ‘Through our City and Growth Deals we are establishing the necessary infrastructure to connect businesses at all levels to new ideas and technologies.’

Regional High Growth Sectors: Engines of Economic Growth

Life and Health Sciences



- ✓ Generates sales of over £800m annually
- ✓ Competitive strengths in clinical trials, medtech and digital health
- ✗ Lack of joined-up infrastructure as found in rest of the UK

Agri-food



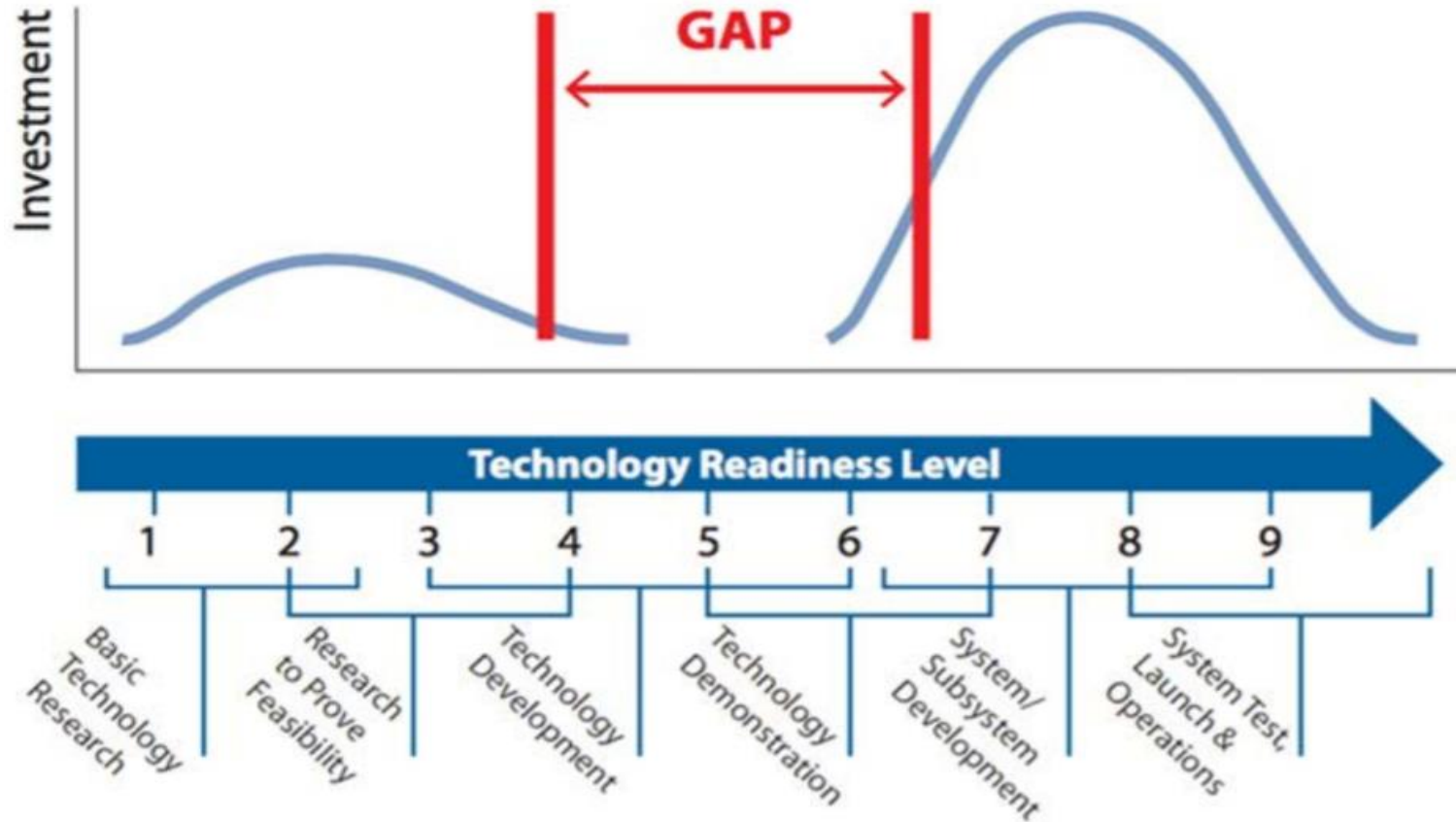
- ✓ NI's largest sector
- ✓ Key source of export sales – generated £1.26 billion in export sales in 2017
- ✗ Challenges of Brexit, carbon neutrality and industry 4.0

Advanced Manufacturing



- ✓ Represents over 30% of total NI employment
- ✓ Almost 40% of sales occur outside of Northern Ireland
- ✗ Increasing automation and pace of change

A translational research agenda



Belfast Region City Deal: People and Partnership

“Partners have worked to identify and build on the local strengths and priorities that will help overcome some of the challenges facing the region, identifying new and more collaborative ways of working that will deliver inclusive growth for the benefit of the Belfast region, and by extension, the wider NI economy.”

BRCD Deal, 2021

£350m

from UK Treasury
for Innovation and
Digital investments

£1bn of investment
for the
Belfast Region
over 15 years.

£350m

from NI Executive for
Tourism and Regeneration,
Infrastructure, and Skills

£300m

co-investment
from private sector,
councils and universities

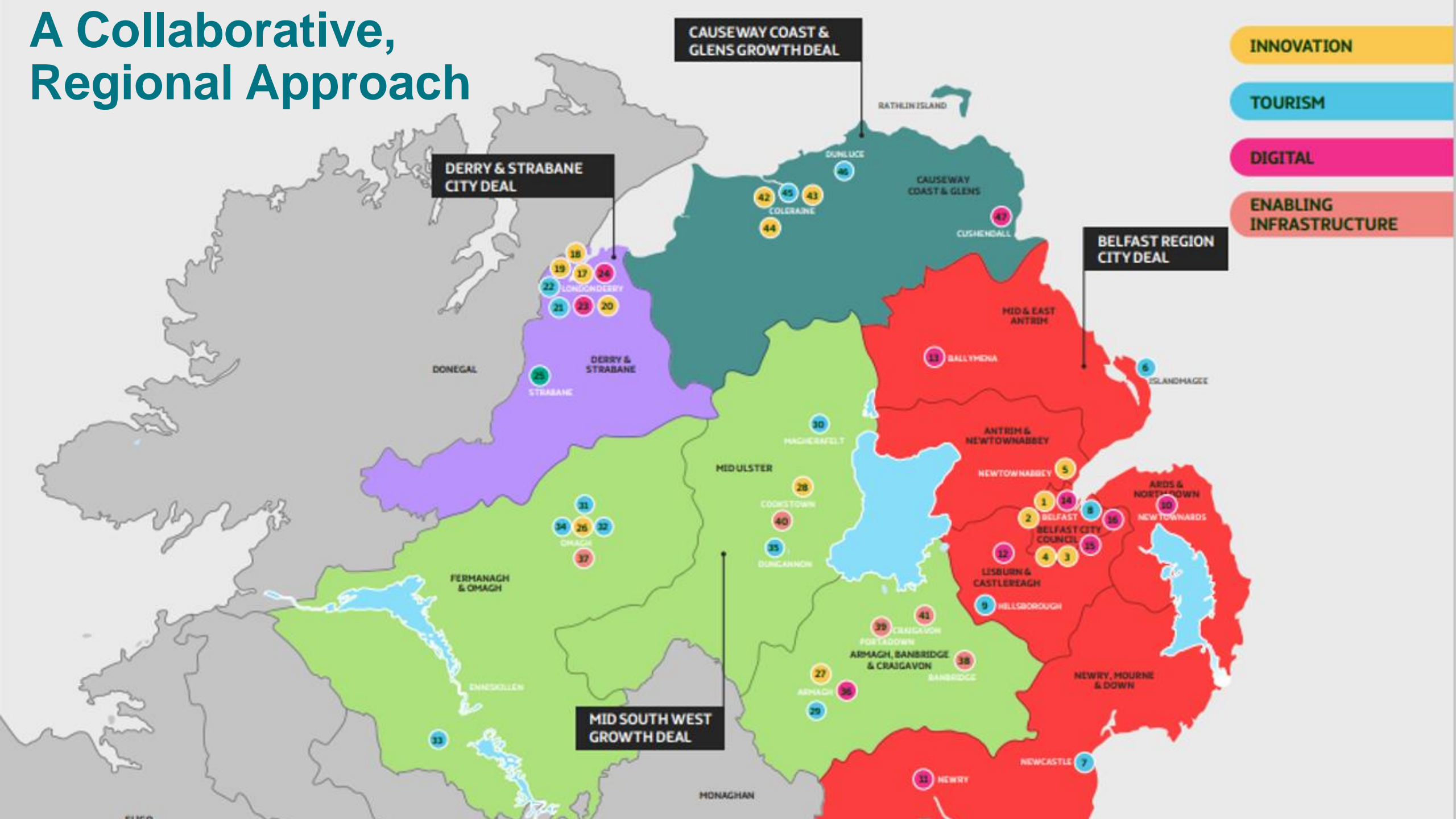
A Collaborative, Regional Approach

INNOVATION

TOURISM

DIGITAL

ENABLING INFRASTRUCTURE



A Big Deal with Big Challenges

How do we create bigger ecosystems?

How do we sustain these long term?

Can we build the right facility on budget?

How do we define the equipment needs?

How should we brand these?

What ideas pipeline do we have?

What is role in Strategy 2030 ambitions?

Faculty Plans?

How do they fit with Business as Usual?

Where do they sit in organisational structure?

How does this connect with other parts of the University?

How can this grow our research base?

What technology roadmaps do partners have?

Are these the right areas of focus?

What does it mean for other areas of research?

Will industry buy into the projects?

What if industry needs don't match University needs?

What if government expectations don't match University needs?

If we create jobs, where will the skills come from?

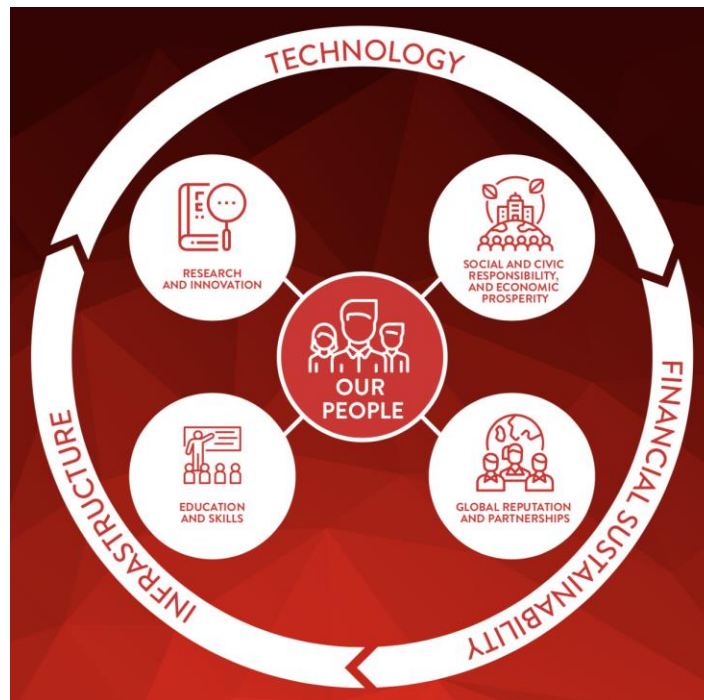
How do we make sure that the opportunities are accessible and inclusive?

How do we create the right environment for translation/impact-focussed collaborative research?

OUR VISION

Our vision is to be a global research intensive university, generating internationally leading research coupled with outstanding teaching and learning, focused on the needs of our society, locally and globally. Our ambition for 2030:

- 01 A GLOBAL UNIVERSITY**
From our hub in Belfast we will build partnerships and collaborations across the globe, attracting the brightest and the best, being known for our exceptional record in diversity, inclusion and sustainability.
- 02 SCALE NEW HEIGHTS**
Climbing the Global league tables and ranked in the top 175 in the world.
- 03 A UNIVERSITY THAT PUTS THE STUDENT EXPERIENCE AT ITS HEART**
with an education that inspires and delivers the engaged global citizens of tomorrow with flexible and broad based learning opportunities that are life long, coupled with outstanding support.
- 04 RESEARCH OF THE HIGHEST QUALITY**
A university known for research of the highest quality, with impact and exceptional translation driving strong partnerships with industry and business.
- 05 A GREAT PLACE TO WORK**
A leading employer for equality, diversity and inclusion with an organisational culture that supports and empowers staff to produce their best.
- 06 AN ANCHOR INSTITUTION**
An anchor institution in Northern Ireland that takes pride in social and civic responsibility supporting progressive social change and economic growth in an environmentally sustainable way.
- 07 FINANCIAL SUSTAINABILITY**
A university that is financially sustainable, with the capacity to invest to deliver the best opportunities for students, staff and society in a changing world.



Underpinning Principles of the City Deal investment:

Research outputs are improved when they are co-created

Cross-faculty and **multi-disciplinary** approach is needed to address complex challenges we face

Impact must be intentional, designed and supported / recognized.

Partnership is an essential enabler of Queen's impact – industry, government, communities and universities

Queen's has an important role to play in delivery of social change and economic growth in Northern Ireland; universities are well placed to lead wider impact through innovation.

Innovation Projects

Advanced Manufacturing Innovation Centre

Future-focused
Manufacturing

Global Innovation Institute

Digital Innovation
across the One
Health spectrum

Institute of Research Excellence for Advanced Clinical Healthcare

A Crucible for
Healthcare
Innovation

Studio Ulster

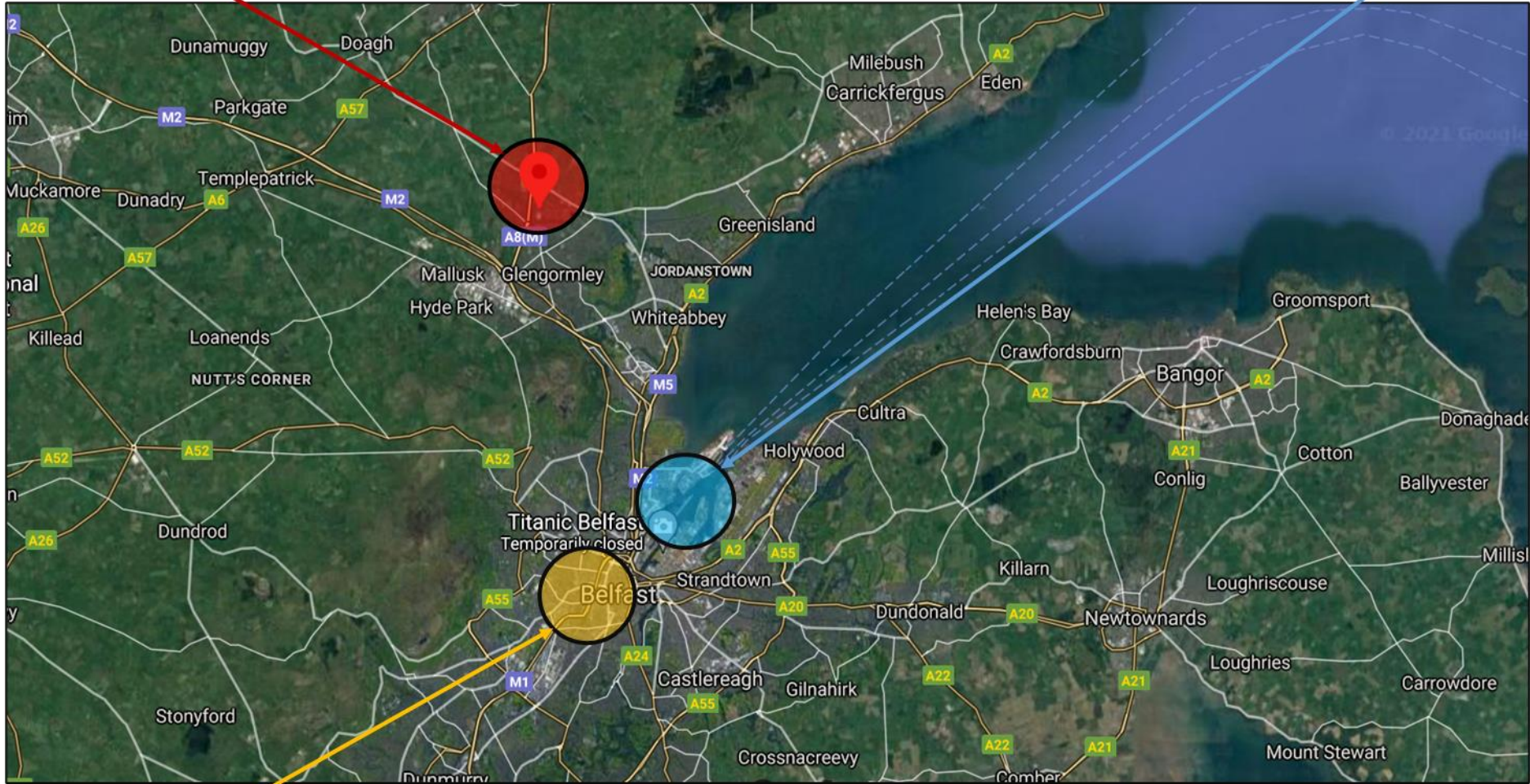
Creatively Led,
Technologically Driven
R&D in Virtual
Production

Centre for Digital Healthcare Technology

Co-created health tech
innovation for socio-
economic benefit

**Advancing Manufacturing Innovation Centre
AMIC (Global Point)**

**Global Innovation Institute
GII (Belfast Harbour)**



**Institute Research Excellence in Clinical Healthcare
IREACH (Belfast City Hospital)**

MOMENTUM

ONE

ZERO

DATA-DRIVEN
INNOVATION
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WORLD IMPACT





MOMENTUM

ONE

ZERO

Purpose of M1.0

To make a real difference to the economy and society in NI by collaborating to grow key areas through distinctive research, targeted innovation and entrepreneurship activities, and an agile approach to skills development to meet the needs of industry.

We will play to our strengths, namely:

- *Selective advanced digital technologies*
- *New science that unlocks the power of data*
- *Deep domain and sectoral expertise that draws on the above.*

MOMENTUM

ONE

ZERO

How M1.0 will fulfil its Purpose

An integrated
portfolio & approach

Co-Location: a hub where businesses and academia collide to create value



Skills: partnership delivery of a flexible and unique set of programmes for industry needs



Entrepreneurship: a highly tailored set of programmes to initiate and grow successful start-ups



Services: in Translation, Data and Innovation which match particular needs with our distinctive capabilities



Research: world-class translation abilities and specialist early-stage research which seeds the future



Extensive teamwork: that unleashes the full power of a modern, integrated university which places its civic role at its heart



Close collaboration: with local, national and international partners who share our civic and global goals



Research in Deep Technological Domains

MD Research in Key Challenge Themes shaped with:

Translation & Innovation Specialisms

10X Sectoral Alignment
• Initial Target Areas

Translational Specialisms converting Research Excellence to Solve Problems and Deliver Economic & Societal Impact

SECURE
Centre for Secure Information Technologies

Institute for Global Food Security

CONNECTED
Centre for Wireless Innovation

Medicine, Health & Life Sciences

INTELLIGENCE
Centre for Data Science & Scalable Computing

Others in EPS & AHSS

Market & Stakeholder Engagement

Commercial Services

Advanced Engineering:

- a. *Research Translation*
- b. *Innovation Services*
- c. *Data & Compute Services*

Advanced Digital & ICT

- CyberAI
- Smart Cities
- Space & Aerospace

One Health * : Agri-Tech + Life & Health Sciences

- Resilience of Food Supply Chains
- Accelerated Disease Diagnosis & Drug Development

Others as capacity builds **, e.g. FinTech

KEY: Plus support for: * iREACH and ** AMIC

Challenges and insights for Research & Innovation

Maturity of partnership – BRCD as 'new way of working in NI'

- Breadth; Public and Private; Ownership; Expectation

Multidisciplinary and 'interstitial' spaces

- Talking different languages; 'Even' partnership; Senior academic leadership

R&D facilities development

- Mix of professional backgrounds & researchers; 'community'

Sustainability

- Creativity and bravery in revenue streams; Appetite for 'new' and 'different'

Living in a grey world

- Project horizon; Rolling with many punches and setbacks

Project title

Smart City-zens

Multidisciplinary
Team



Dr Hamza Shakeel

Wireless
sensing

Public health at
community level



Dr Gareth Robinson

Partners

[Market Development Association](#)

The MDA aims to empower the local community through the promotion of active citizenship within the community and in the wider city of Belfast. The MDA strives for equality, and promotes a rights based approach when dealing with the many socio-economic issues that impact on the Market community.

Description

Citizen science project involving 'community sensing', co-created and carried out with and by the local community. The project includes co-design and deployment of a system of low-cost sensor technologies, to gather data on wellbeing issues of concern to citizens. The broader objective is to support 'intelligent, innovative communities' that can achieve agency over their own data and leverage it in different ways to tackle familiar urban problems, e.g., air pollution, biodiversity, climate change, future food production.

Calculating The Human Proteoform Maximum Theoretical Peptide Index as A Novel Commercial Resource for Industry and Academia.

Project title

Multidisciplinary Team

Partners

Description

High Performance Computing

Complex data driven system biology and multi-omic integration



Dr Thai Son Mai

Prof Gary Hardiman

[Altomics Datamation Ltd.](#)

The personalized medicine process to therapeutic invention is based on the principle of 'right drug, right person, right time'. Powered by sophisticated instruments and complex science, the identification and measurement of any physiological molecule in the body is now possible. Despite technological advances between 20 and 30% of peptides detected remain unidentified. This project provides a solution to this problem. It is within this uncharacterized peptide subset where novel disease specific proteoforms and biomarkers will be discovered. This proteoform atlas embodies the new era in protein-based molecular diagnostics in much the same way the Human Genome Project has led to demonstrable strides toward understanding the basis of disease at the genomic level. Although calculation and indexing all potential human proteoforms is a moon-shot project it is the critical and inevitable first step to advancing real time molecular phenotyping facilitating personalised medicine.

iREACH
HEALTH

HEALTH DRIVEN
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iREACH Health

Will integrate the activities of clinicians, life scientists and data scientists with industry partners to identify and develop new diagnostic tests, treatments, and health related technologies for patient benefits.

iREACH Health is set to drive:

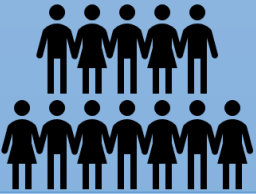
- Rapid co-development on the innovative design and delivery of Phase 1 and Phase 2 trials of drugs and medical devices.
- Closer engagement between industry, clinicians, and academics – delivering new research and commercialisation opportunities.
- High-value job creation and inward investment.
- Patient benefit, through early access to healthcare innovations.
- New care pathways for the NHS, in the region and beyond.

How will iREACH Health work:

- iREACH Health will provide co-ordinated access to clinical investigators and patients through a point of contact for industry and stakeholders, through accessible clinical research support infrastructure, and through streamlined and timely clinical trial approvals.

Northern Ireland Collaborative Ecosystem

Changes to Healthcare practice or treatment

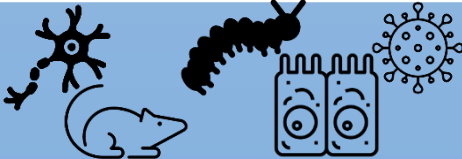


- Dept. of Health
- Public Health Agency
- Data inputs – Health Data Research UK, DATA-CAN EPIC/ Encompass
- NI Biobank
- AMIC

Centre for Public Health
Nursing and Midwifery
Precision Medicine Centre of Excellence
Patient Registries (Cancer, CF, Asthma, CO)
GII/
CME: Intersim

Industry/ start-ups
CV6
SONRAI
Phion Therapeutics
Cirdan imaging
Causeway Sensors

Preclinical translatable research



Future Medicines Institute

Institute For Experimental Medicine
PGJ Centre for Cancer Research
School of Pharmacy
Biological Sciences

Start-ups/ Pharma
ReVANA
Vasc-Versa
MediNect
ProAxis
Randox
Almac

Informatics

- Precision Medicine Centre of Excellence
- NI Biobank
- School of Electronics, Electrical Engineering and Computer Science
- GII/Momentum 1.0
- School of Maths and Physics
- Illumina

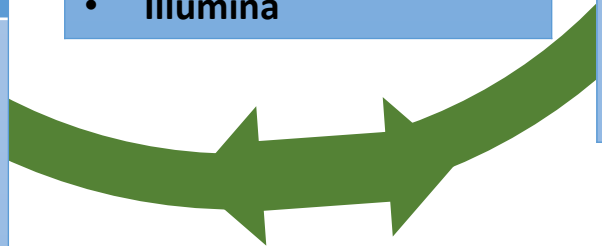
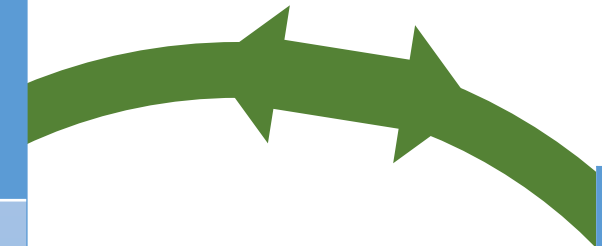
Patient centred translational research



- iREACH Health
- NI-CRF
- Centre for Public Health
- School of Pharmacy
- PGJ Centre for Cancer Research
- Institute for Experimental Medicine
- Nursing & Midwifery
- Psychology
- CPH, Law & ethics

Celerion
Industry/ Start ups
ReVANA
Vasc-Versa
ProAxis
Fusion Antibodies
Cirdan imaging

R&D/NICRN
HSC Trusts
Primary care
NI Biobank
PMC (Formally THRIVE)
CDHT
Randox
Almac





Site A: Patient Facing Clinical Trial Delivery

- **Celerion – 100 bed facility**
- **NICRF – 20 clinical rooms**
- **Research Pharmacy unit**

Site B: Core space to support setup & delivery of clinical trials

- **Clinical trial delivery:** NICTU/ NICTN/ NICRN/ NICRF
- **Research Governance, Finance & Contracting:** HSC Research Office, HSC Innovations, Finance, HSC R&D
- **Regulatory Approvals:** ORECNI
- **Industry Tenant & Innovation Hub space:** Exploristics, Celerion
- **Lab service space:** Evolve Service Lab
- **Public Engagement Area**



**ADVANCED
MANUFACTURING
INNOVATION
CENTRE**

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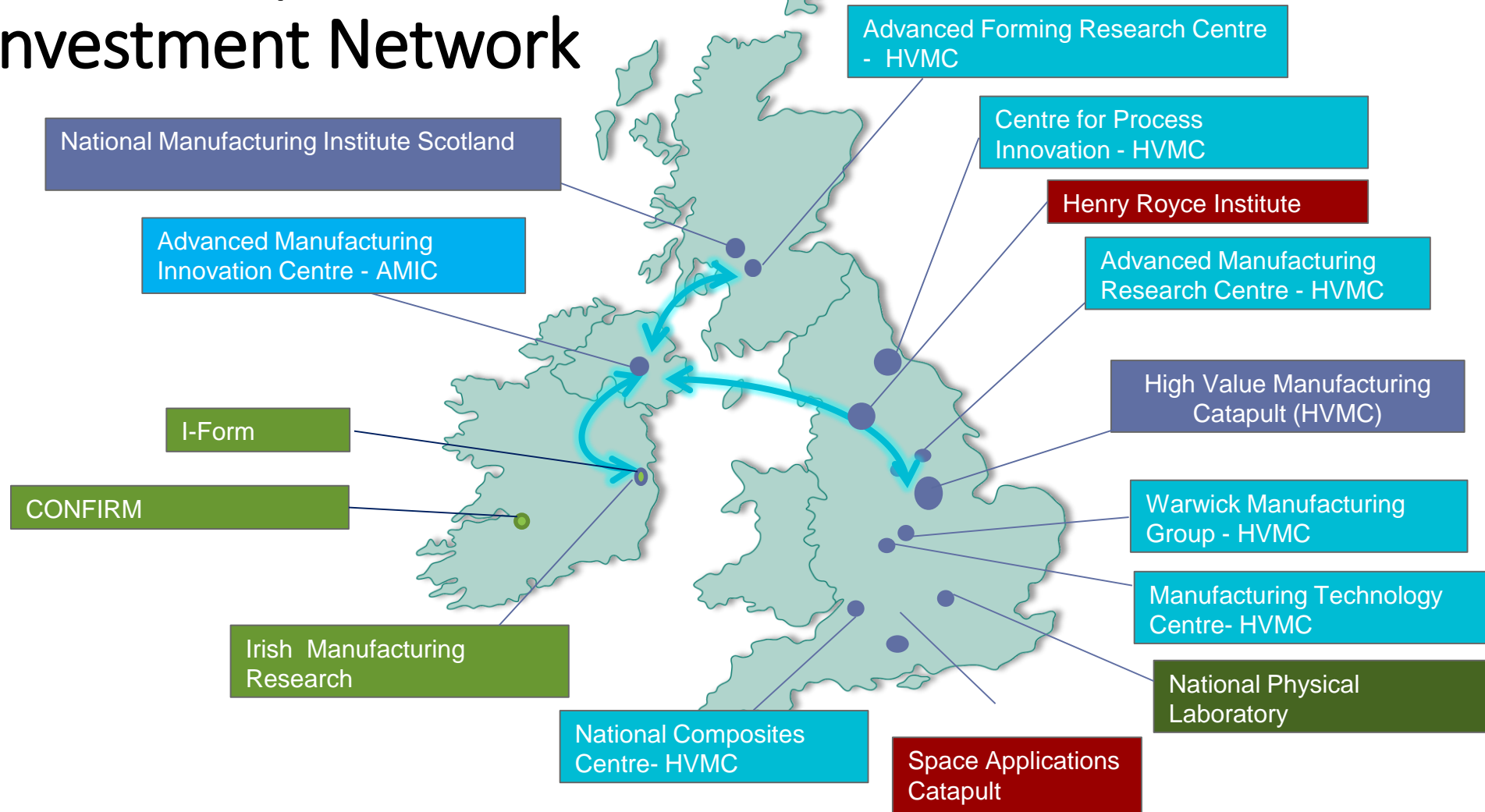


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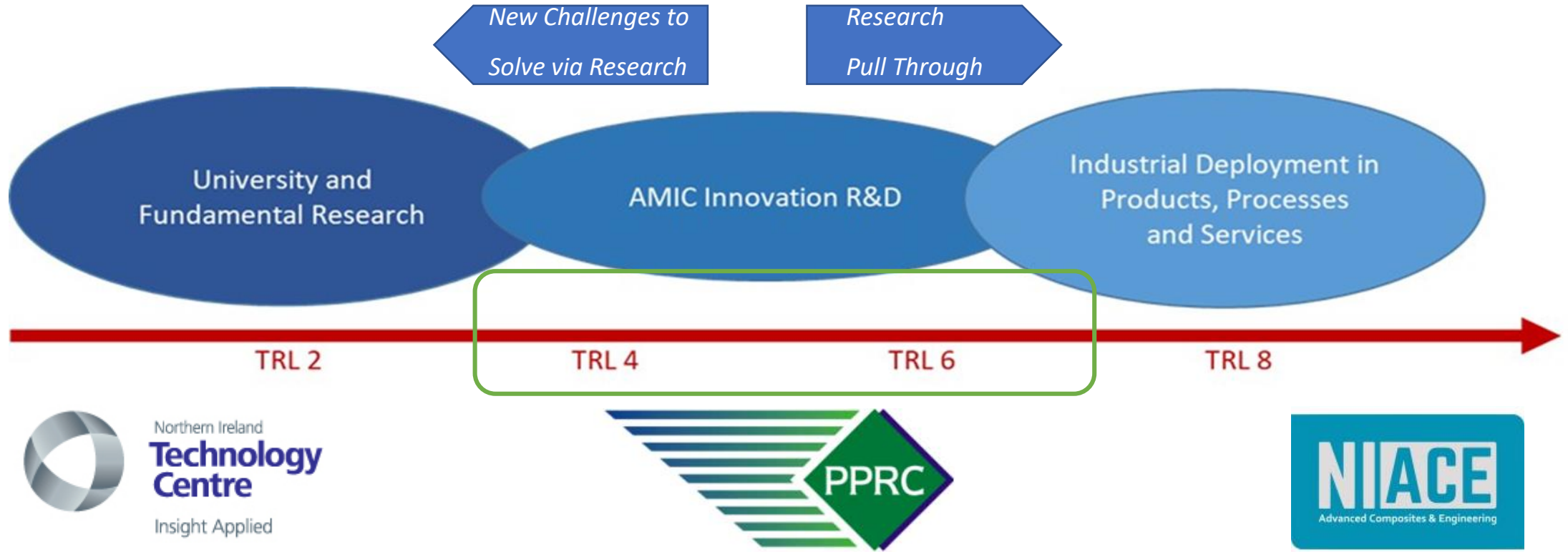
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AMIC will place NI in an Advanced R&D and Investment Network



A unique opportunity to get NI on the national map of advanced manufacturing capabilities, attracting funding, securing our prosperity and safeguarding our future.



Connecting Skills & Innovation

Skills and innovation has long been at the core of economic growth in advanced economies. And looking forward, the importance of skills and innovation policy will continue to increase. The increasing pace and intensity of technological change and international competition are creating substantial new challenges and opportunities for the skills and innovation system in advanced economies. Skills and innovation capability will increasingly shape national economic performance

“The UK’s research and innovation system has remarkable strengths across the country... However, we still have too few strong innovation clusters. **Too many places are not yet fulfilling their innovation potential, missing out on the good jobs and growth that a thriving local innovation economy can bring**, and not enough places are seeing the economic benefits of innovations developed elsewhere through the adoption of those innovations.

Addressing this challenge will be a central part of meeting the government’s objectives for levelling up the UK economy.”

Skills Assessments & Sectors

ADVANCED MANUFACTURING	<ul style="list-style-type: none">• BRCD: Advanced Manufacturing Innovation Centre/i4C/Digital Twin• MSWGD: Engineering & Skills Innovation Centre, Robotics, Automation & Packaging Innovation Centre<ul style="list-style-type: none">• S&SCD: Centre for Industrial Technologies and Automation	September 2022-March 2023
CREATIVE INDUSTRIES	<ul style="list-style-type: none">• Studio Ulster• Shed 1.0	October 2022 – May 2023
DIGITAL (including sub-categories Fintech & Agrifood)	<ul style="list-style-type: none">• BRCD: GII, iREACH, Digital Twin, Regional Innovation Hub, Newry and LCCC• CC&GGD: Digital Innovation Hub @ Enterprise Zone, Grow the Glens Digital Hub<ul style="list-style-type: none">• MSWGD: ABC Digi-Hubs Network• D &SCD – Cognitive Analytics Research Laboratory	January 2023 – July 2023
HEALTH & LIFE SCIENCES	<ul style="list-style-type: none">• BRCD: GII, iREACH, CDHT• CC&GGD: Centre for Drug Discovery & Pharmaceutical Innovation<ul style="list-style-type: none">• MSWGD: Agri-tech & Food Innovation Excellence Centre• D&SCD: Transformation or Healthcare Research Innovation & Value Based Eco-system, Graduate Entry Medical School, Cognitive Analytics Research Laboratory	TBC in 2023
GREEN/CLEAN TECH	<ul style="list-style-type: none">• I4c• AMIC	TBC IN 2023
CONSTRUCTION	<ul style="list-style-type: none">• Multiple	COMPLETED DECEMBER 2022
TOURISM	<ul style="list-style-type: none">• Multiple	TBC in 2023

Contact Us

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