Impact from Excellence:
The role of innovation hubs

Tyndall National Institute

Ireland's National Institute for Information and Communication Technology

Giorgos Fagas
Head of EU Programmes
Georgios.Fagas@Tyndall.ie

Our mission

Build on 30 years of achievement to ultimately become:

- **International leader in integrated ICT research** working to raise the technological base in Ireland;

- Synonymous with the delivery of disruptive and deployable technological **solutions to society's challenges** in energy, health, communications, agriculture, food and the environment;

- A key **catalyst** for the generation of new **high-tech business, jobs and growth** for the Irish economy;

- A national and global **partner of choice** facilitating and enabling R&D and innovation in Ireland to deliver on national objectives;

- A primary source of **highly-skilled people** for Ireland's current and future technology companies;

- The **gateway** for industry and academia to access ICT-related expertise and capabilities in Ireland.

Irish Research Ecosystem
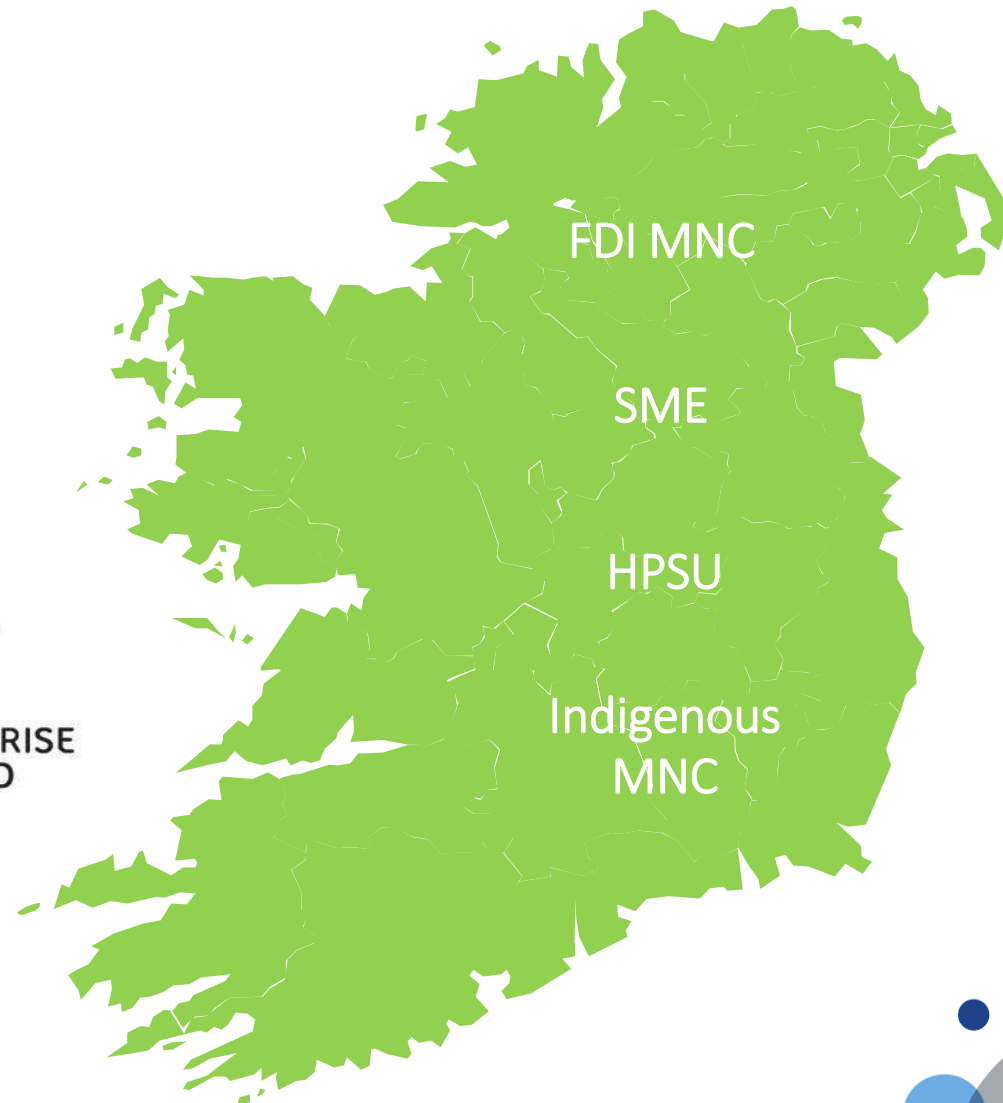# Irish National Science funding moving to Research Centres centred on National Economic Priorities

Innovation Hub:
Partnering to Create Impact

Partner with Regional/National Clusters

- **Launch needs-driven regional & national initiatives**
- **Coordinate with public authorities and local government**
- **Partner in Europe**
- **B2B match-making and brokerage**

Some of our clients…

- **200 active industry partners WW**
- **>160 client visits to Tyndall in 2015**
- **Joint target company activity with agencies IDA & EI**
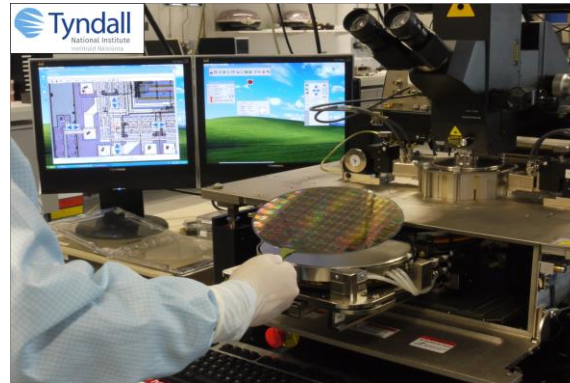- **Competitively won exchequer funds leveraged with EU and commercial contracts**

Providing Access

State-of-the-art 14 nm bulk FDSOI CMOS

Fabrication facilities for nanowires & 2D materials

State-of-the-art 14 nm FinFET CMOS

Advanced transistor and interconnect test structures

Advanced nanowire and nano-electrode test structures

Advanced transistor and interconnect test structures

Electrical & nano-characterization platforms

Electrical & nano-characterization platforms
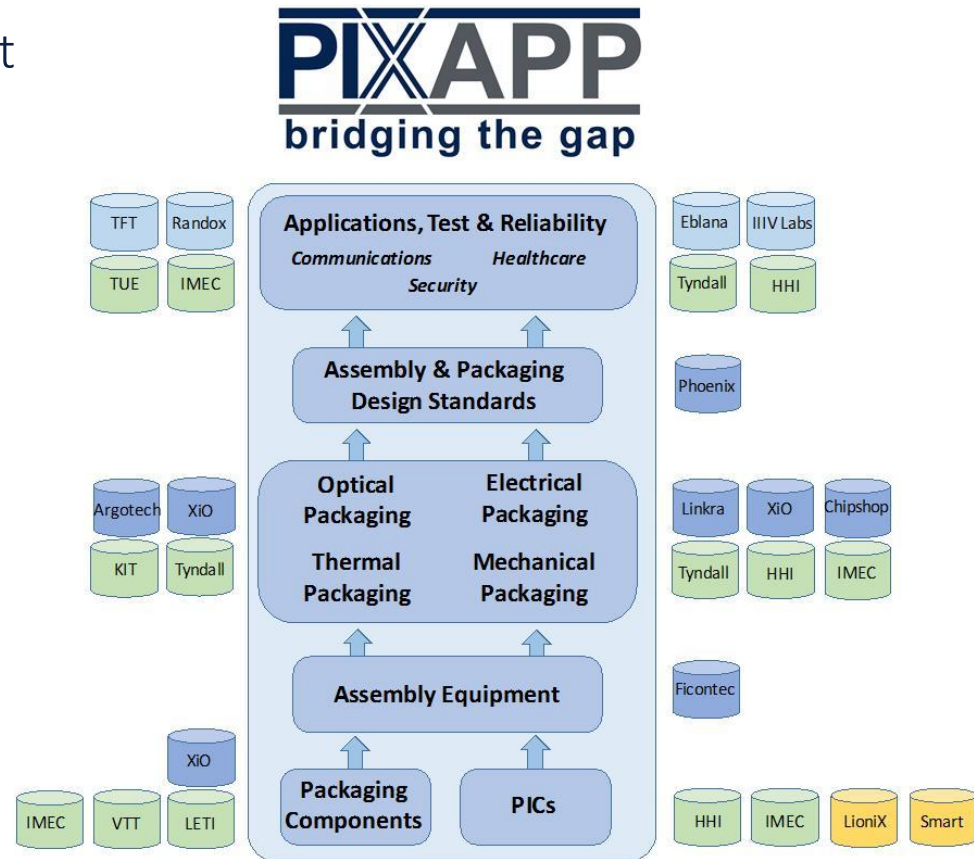
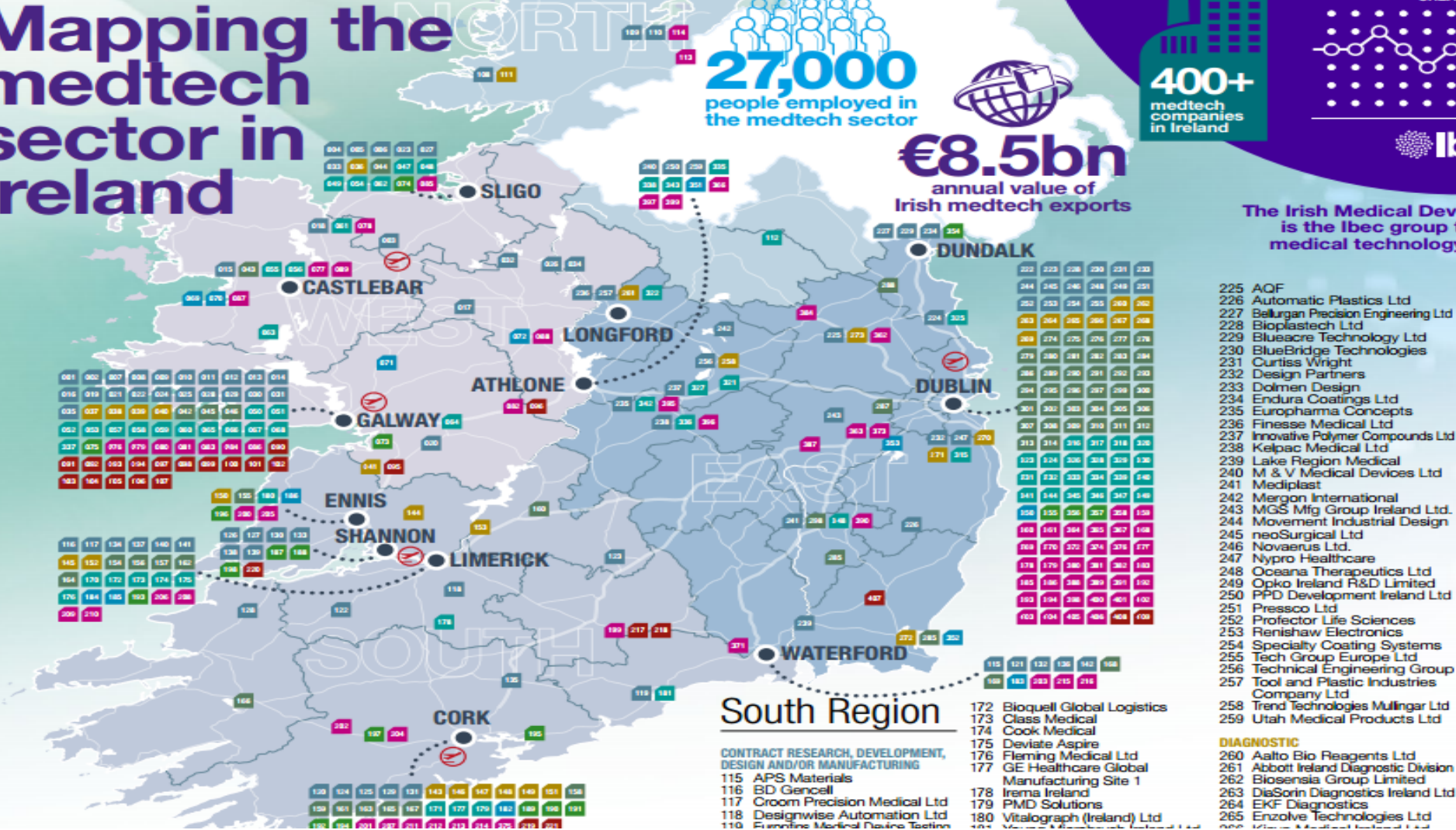Electrical & nano- characterisation platforms

www.ascent.network

Pilot Line facility

- H2020 Photonics Packaging Pilot Line proposal funded

- Coordinated by Peter O'Brien

- World's first open access photonics packaging pilot manufacturing line

- Will develop route to scalable, high volume, low unit cost manufacturing for integrated photonics

- Value €14M (€2.8M to Tyndall)
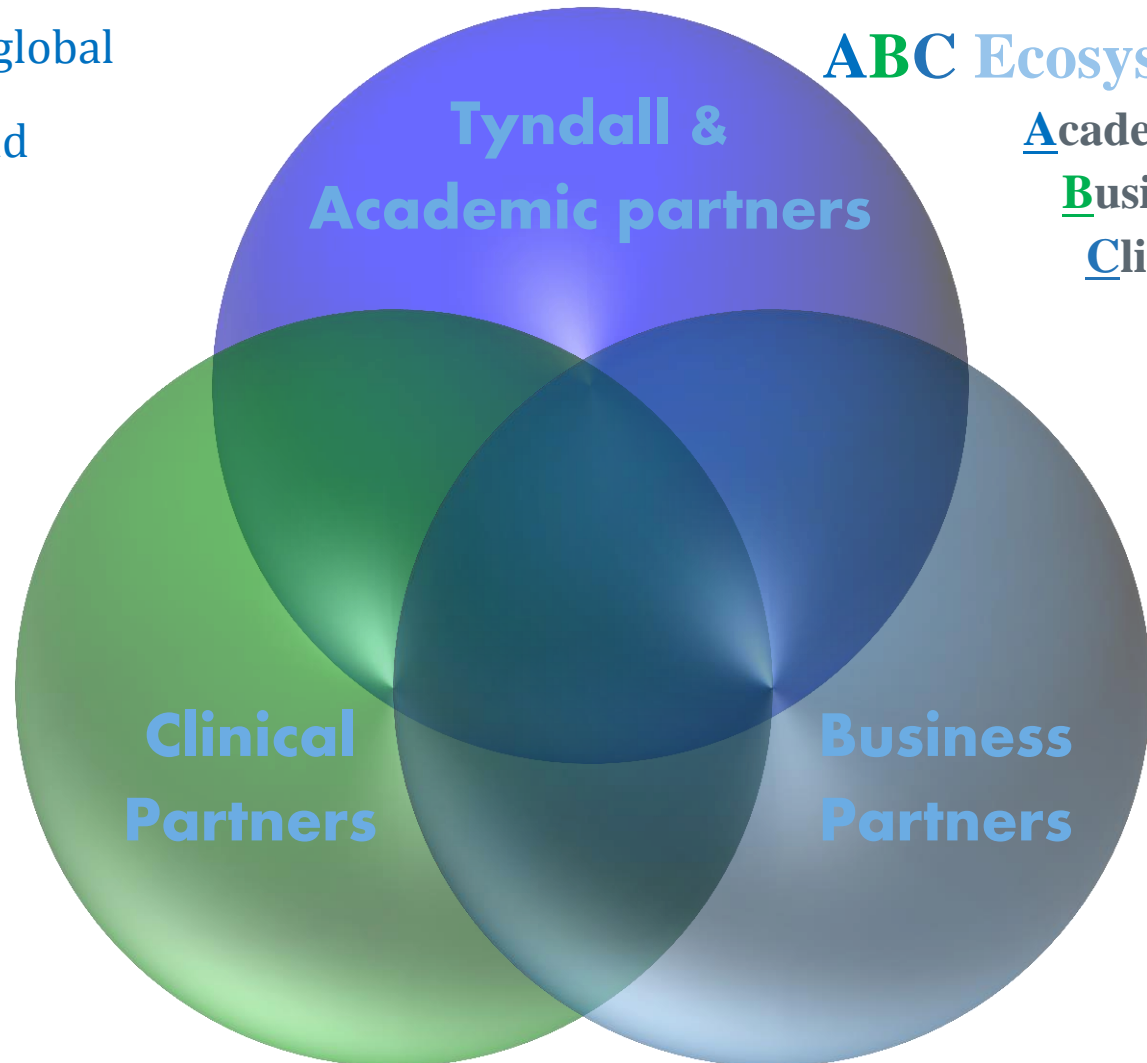
Mapping the medtech sector in Ireland

27,000 people employed in the medtech sector

€8.5bn annual value of Irish medtech exports

400+ medtech companies in Ireland

The Irish Medical Dev... is the Ibec group... medical technology...

SLIGO · CASTLEBAR · LONGFORD · ATHLONE · GALWAY · DUNDALK · DUBLIN · ENNIS · SHANNON · LIMERICK · WATERFORD · CORK

NORTH · WEST · EAST · SOUTH

225 AQF
226 Automatic Plastics Ltd
227 Bellurgan Precision Engineering Ltd
228 Bioplastech Ltd
229 Blueacre Technology Ltd
230 BlueBridge Technologies
231 Curtiss Wright
232 Design Partners
233 Dolmen Design
234 Endura Coatings Ltd
235 Europharma Concepts
236 Finesse Medical Ltd
237 Innovative Polymer Compounds Ltd
238 Kelpac Medical Ltd
239 Lake Region Medical
240 M & V Medical Devices Ltd
241 Mediplast
242 Mergon International
243 MGS Mfg Group Ireland Ltd.
244 Movement Industrial Design
245 neoSurgical Ltd
246 Novaerus Ltd.
247 Nypro Healthcare
248 Oceana Therapeutics Ltd
249 Opko Ireland R&D Limited
250 PPD Development Ireland Ltd
251 Pressco Ltd
252 Profector Life Sciences
253 Renishaw Electronics
254 Specialty Coating Systems
255 Tech Group Europe Ltd
256 Technical Engineering Group
257 Tool and Plastic Industries Company Ltd
258 Trend Technologies Mullingar Ltd
259 Utah Medical Products Ltd

DIAGNOSTIC
260 Aalto Bio Reagents Ltd
261 Abbott Ireland Diagnostic Division
262 Biosensia Group Limited
263 DiaSorin Diagnostics Ireland Ltd
264 EKF Diagnostics
265 Enzolve Technologies Ltd
266 Kiya Medical Ireland Ltd

South Region

CONTRACT RESEARCH, DEVELOPMENT, DESIGN AND/OR MANUFACTURING
115 APS Materials
116 BD Gencell
117 Croom Precision Medical Ltd
118 Designwise Automation Ltd
119 Eurofins Medical Device Testing

172 Bioquell Global Logistics
173 Class Medical
174 Cook Medical
175 Deviate Aspire
176 Fleming Medical Ltd
177 GE Healthcare Global Manufacturing Site 1
178 Irema Ireland
179 PMD Solutions
180 Vitalograph (Ireland) Ltd
181 Young Maywbrough Ireland Ltd

Recognised as one of the five global emerging hubs

Employing over 29,000 people

2nd largest employer of medtech professionals in Europe

Annual exports of €12.6 billion

50% of the 450 medtech companies based in Ireland are indigenous

Tyndall ICT for Health
Leading an ABC Ecosystem

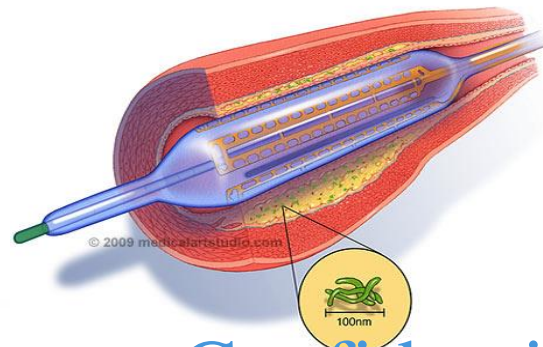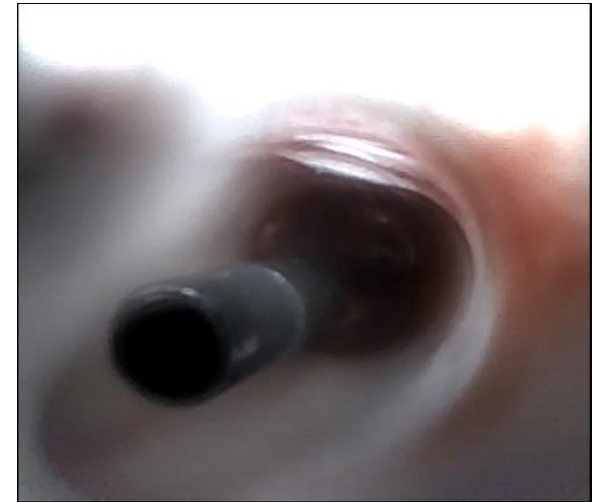We **Collaborate** with global medtech companies, world leading clinicians and leading scientists.

ABC Ecosystem
(**A**cademic, **B**usiness, **C**linical)

Tyndall & Academic partners

Clinical Partners

Business Partners

Tyndall
National Institute
Institiúid Náisiúnta

Optical Imaging using micro scale CMOS camera

IoT SME example:
PMD Wireless Solutions

- **Market opportunity** – Medical Device Market, particularly in the area of Respiratory Sensing

- **Technology developed** – Wireless Interface for Medical Systems, Matrix for precise positioning of Respiratory Sensors

- **Outcome/impact** – Secured VC & EU funding, Medtec Ireland Academy of Excellence Winner 2014, IMDA Excellence Award Emerging Company Category Finalist 2014

- Nov 2015 PMD receives €4.2m funding from H2020 SME instrument to tackle in-hospital respiratory compromise
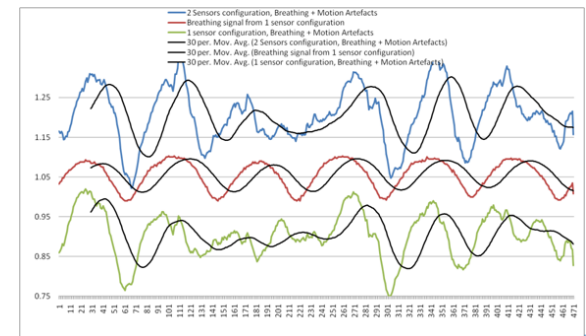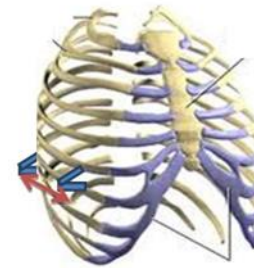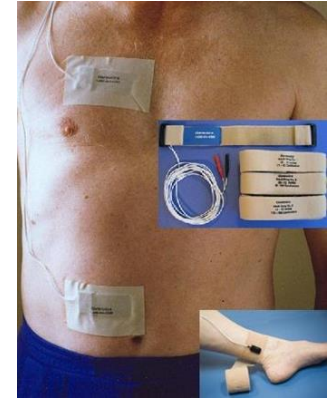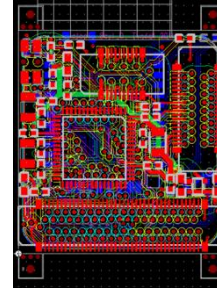
INTERREG Ireland-Wales regions

Partners
Swansea University
Bangor University
Cardiff University
University College Dublin
Tyndall National Institute, University College Cork
National University of Ireland Galway

Stakeholders
GE Healthcare
Unilever
Life Science Hub Wales
INTERREG
Welsh Government
Irish Government
SME representative

Ireland-Wales platform for industry driven innovation in Advanced Life Sciences through demand-driven collaborative projects

Cross-border cluster of HEIs, healthcare providers, local SMEs and MNCs

Link SMEs with supply chains spanning Ireland and Wales.

Deliver technology advances through new products, processes and services

AgriFood sector in Ireland

- 230,000 jobs linked to the agri-food sector

- €26bn turnover in the sector

- €10.5bn worth of exports in 2014 to 120 countries

- Half of exports by indigenous Irish companies

- Destinations : UK 40%, rest of Europe 31%, international markets 29%

- Total payroll in the sector is €1.8bn – more than any other manufacturing sector

- €9.6bn worth of materials purchased - 76% are sourced in Ireland

- €3bn worth of services purchased - 55% are sourced in Ireland

ICT for Sustainable Agriculture, Food and the Environment

Tyndall National Institute · Institiúid Náisiúnta

gateone PROJECT

Nano-chemical sensors for in-the-field animal health diagnostics

Chemical instrumentation for water quality monitoring in harbours

Photonic sensors for water quality monitoring in fishery and fish production

Novel Capacitive Deionisation system and Dissolved Oxygen Sensor for pathogen detection

Anti-biofouling coatings

SMARTER - SI
Smart Access to Manufacturing for Systems Integration

Microsystem technology for food and beverage

Tyndall Active in Teagasc Stategy for 2035

- **International Steering Committee**
- Agricultural Technologies
- Food technologies
- Animal Biotechnology
- Crops Biotechnology
- Food Biotechnology
- **Environmental Technologies**
- **Nano Technology**
- **Digital technologies**
- Energy and transportation Technologies
- Socio-Economic Sciences

Ploughing Championships:
Closer to our customers' customers
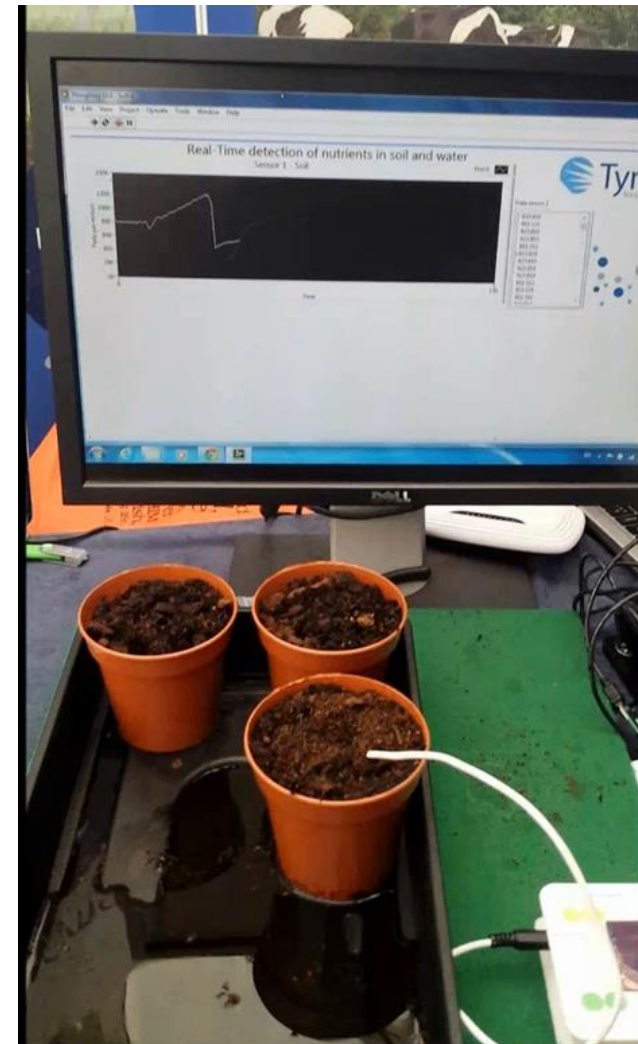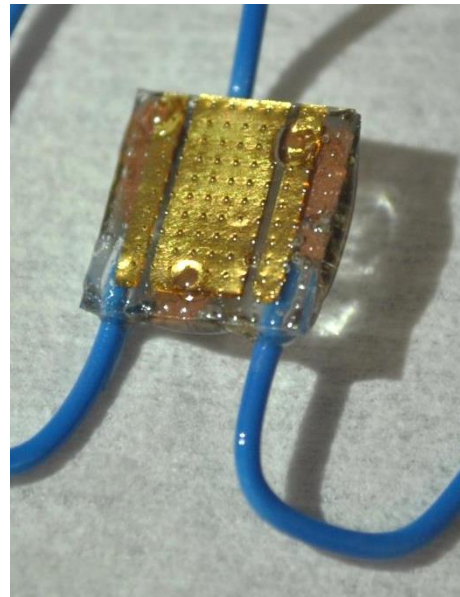
Wireless-interfaced nano-electrochemical sensors

IoT SME example:
Brockley Group Ltd

- **Market opportunity** – Wireless Tank Monitoring of bulk commercial tanks, possibly residential

- **Technology developed** – A Multi Modal Wireless Tank Monitor for measuring various size Tanks and fluids with enclosure

- **Outcome/impact** – Successful demonstration of Prototype Product 'TopCat'
  - New EI funding to optimise the wireless Tank Monitoring unit to a production ready prototype and deploy between 100-500 units around Ireland.
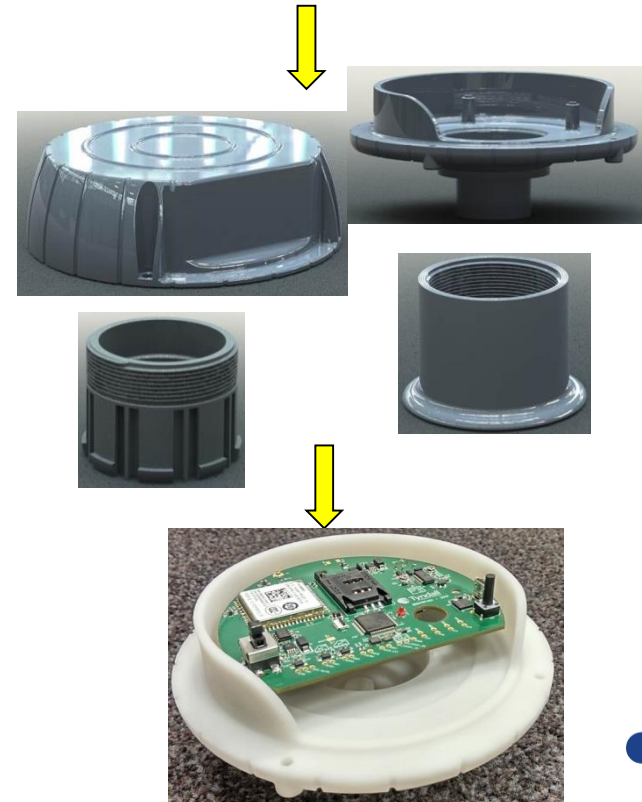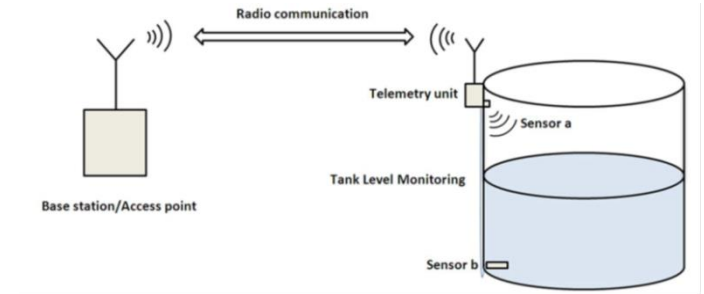
Industry engagement

- Support growth of SMEs
  - Access to Tyndall facilities/expertise, skilled graduates, incubation and acceleration, close partnerships, EU gateway, partner with EI

- Support growth of MNCs/FDIs
  - Facilities/expertise, training fab, researchers-in-residence, incubation + acceleration, close partnerships, EU collaboration

Economic value to Ireland

- Attract & Embed FDI
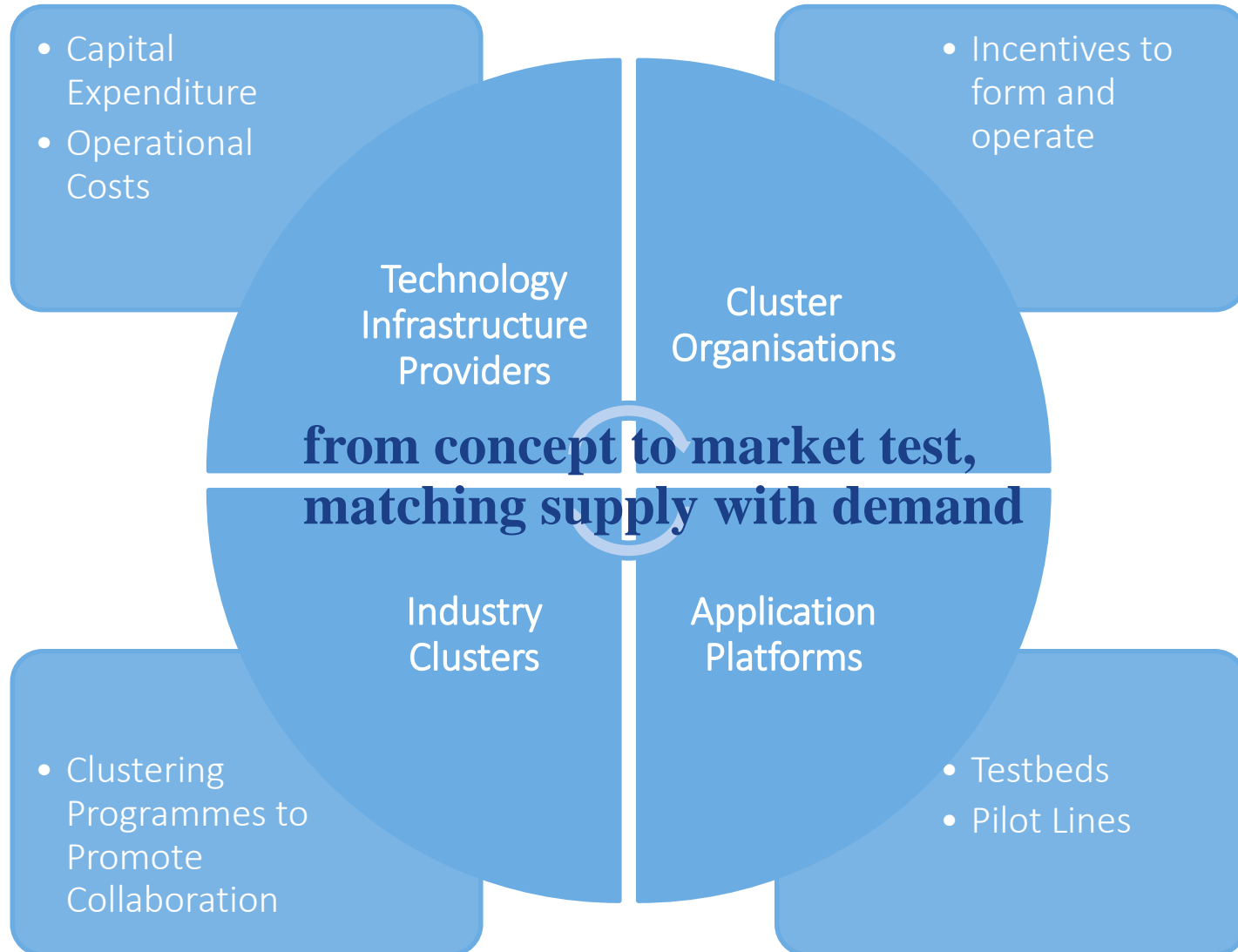 - World leading science, technology & expertise, close partnerships,

- New Start-up Companies
  - 10 companies based on Tyndall technology

- Training highly qualified MSc and PHDs

Investment for innovation network of multidisciplinary translational competence

- Capital Expenditure
- Operational Costs

Technology Infrastructure Providers

- Incentives to form and operate

Cluster Organisations

from concept to market test, matching supply with demand

Industry Clusters

Application Platforms

- Clustering Programmes to Promote Collaboration

- Testbeds
- Pilot Lines

# Pervasive Nation: Making Ireland the Definitive IoT Testbed Island

- Blanket Ireland in IoT Infrastructure
- Connect a million Things
- Can assess sensors, service apps, data sets, business models, architectures, etc.
- Open up opportunities for existing companies
- Seed 200 new companies

Pervasive IT Infrastructure is Critical to realise Smart Anything Everywhere opportunity

Pervasive Nation builds an IoT testbed of scale which will become a crucial resource for industry, government & academia & act as a catalyst for innovation in the IoT space.

SFI Centre Submission - FutureMilk
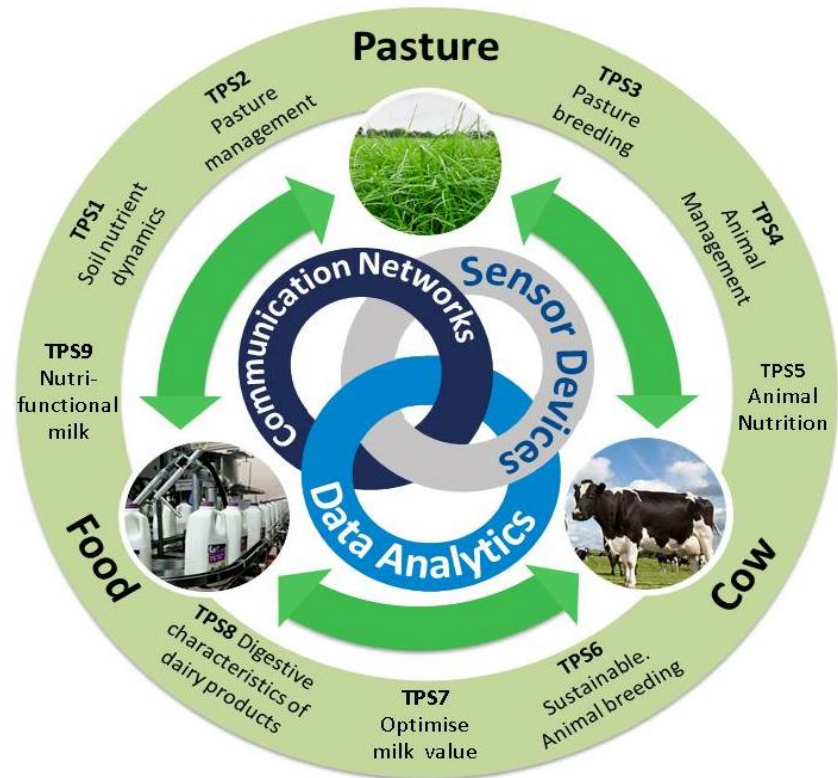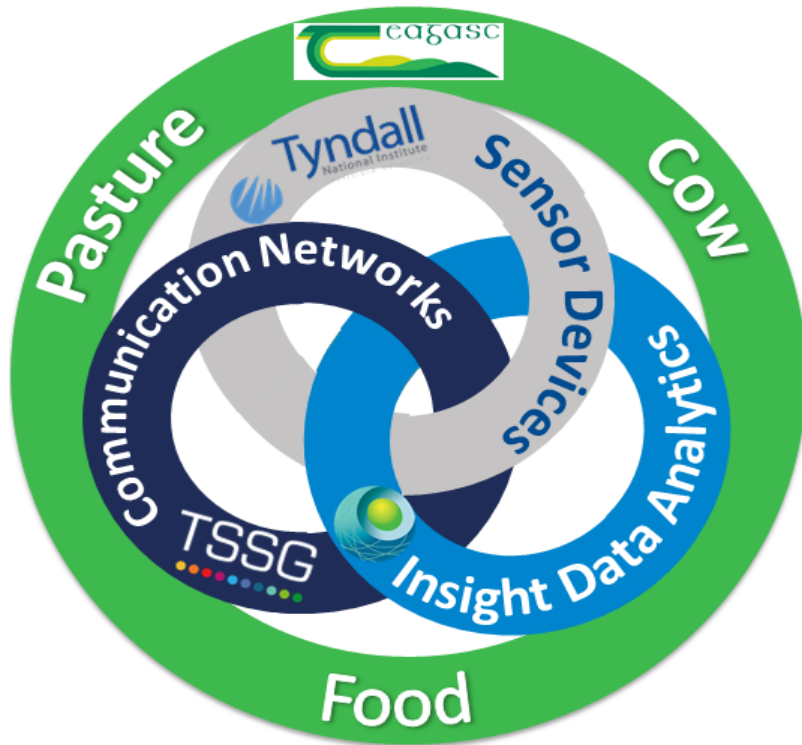
€30m bid (€23m from SFI)

Thank you

Questions?