

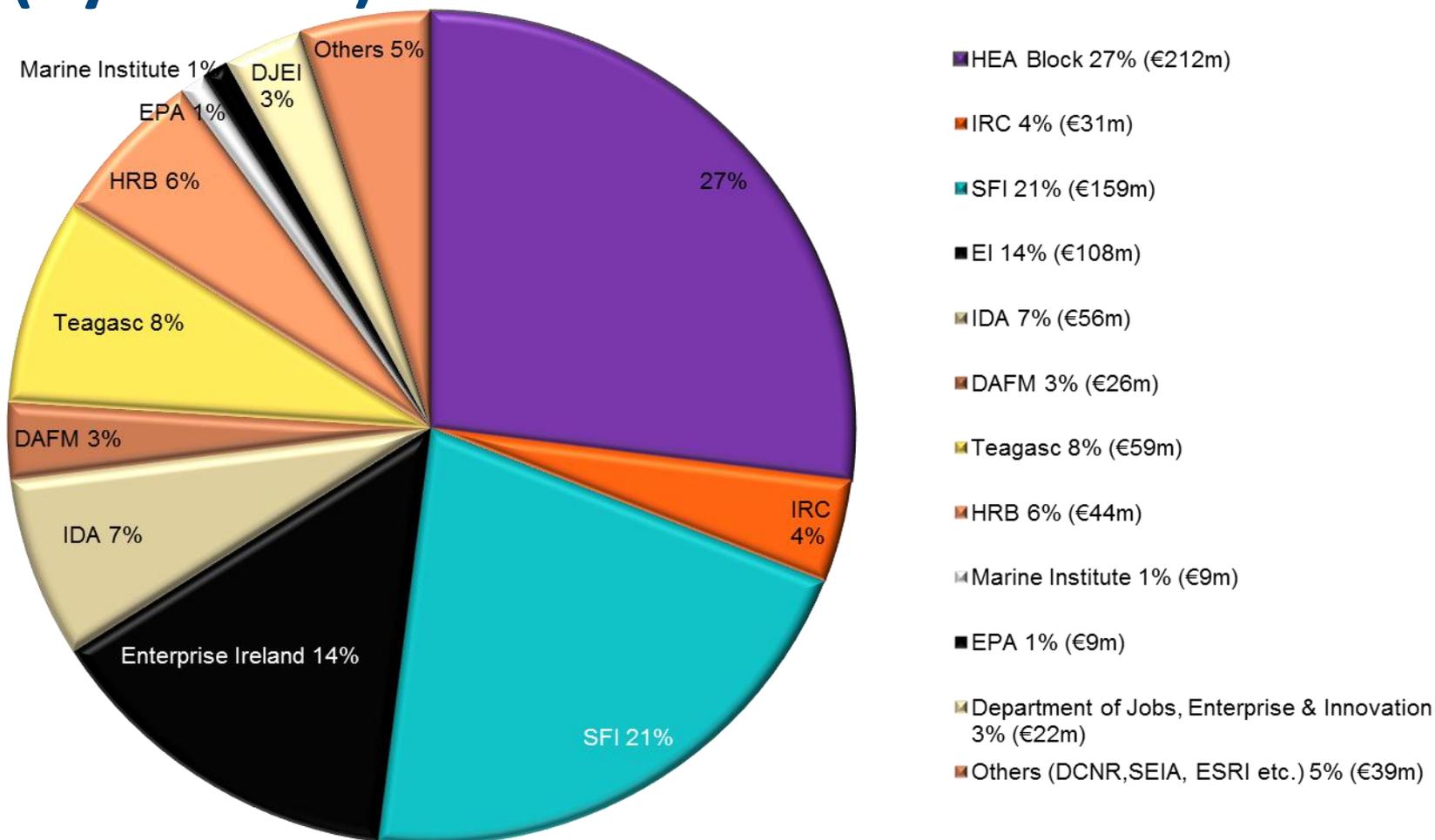


Science Foundation Ireland Programmes for Research Funding

Professor Mark Ferguson
Director General, Science Foundation Ireland
& Chief Scientific Adviser to the Government of Ireland

Trinity College Dublin Faculty of Health Sciences Research Day
Thursday 15th September 2016

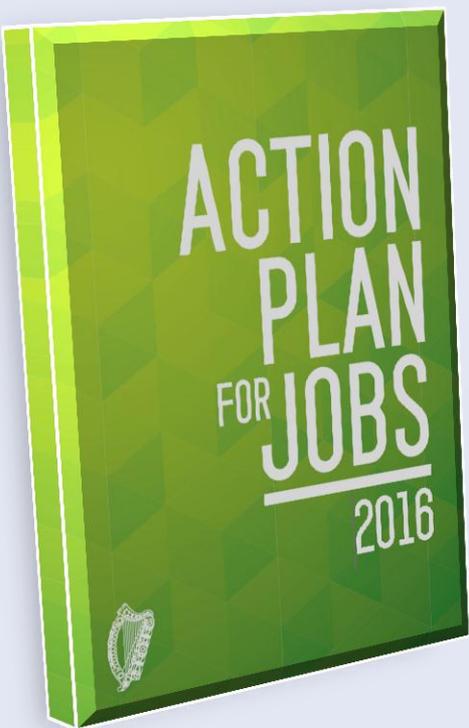
Public Expenditure on R&D 2013 (by funder)



DJEI 45%, DES 31%, DAFM 12%, DH 6%, Others 6%

Total: €773 million

Key Irish Government Policies and Plans for Scientific Research and Innovation



Science Foundation Ireland Position in the RDI Landscape

Department of Jobs, Enterprise & Innovation



Supporting Indigenous Irish Companies

Supporting Research and Innovation for the Future

Supporting Multinational Companies in Ireland

RDI Funding Spectrum TRL

0. Idea	2. Technology formulation	4. Small scale prototype	6. Prototype system	8. First of a kind commercial system
1. Basic research	3. Applied research	5. Large scale prototype	7. Demonstration system	9. Full commercial application

Science Foundation Ireland

Enterprise Ireland

IDA

Science Foundation Ireland

Key Information

Founded in
2000

Officially
established in
2003

€2bn
Spent and
€2.4bn

Committed
to date in

4,470
Awards

As at 31 December 2015

700 Live Awards

with future commitments totaling

€426m

What SFI Actually Does

- Makes **grants** to Higher Education Institutes (HEIs) in Ireland
- Based on competitive, international merit review for scientific **excellence** and **impact**
- Trains **people**
- Builds **infrastructure**
- Produces **scientific results** and technology (Research Output)
- Transfer of the **Research Output** to existing and new companies for **economic and societal impact**
- Supply of appropriately trained people along the entire **science and technology pipeline**
- Significant industrial **collaboration** attracting, anchoring and starting companies
- **Leverages** other research funding e.g. Industrial / EU / Charitable / Philanthropic / International
- Fosters high levels of **collaboration** between academia, industry, charity, disciplines, sectors, institutions, people and countries
- Operates in an **open, agile** and **engaged** mode with a willingness to **seize** new opportunities

What Science Foundation Ireland delivers for it's annual €160m budget

A research engine of **3,000** people led by **450** leading scientists

12 world leading research centres spanning several HEIs and industry

750 Active Research Projects

Generating Annually

3,000 scientific publications

17 spin out companies formed

1200 collaborations with industry (50% MNCs, 50% SMEs)

30 licensed technologies

80 patent filings, **25** patents awarded

€170m in leveraged non-SFI funding

1,850 international collaborations in over 60 countries

500 primary schools received Discover Primary Science and Maths Awards

500,000 citizens reached through SFI Discover Programme



Ireland's Standing in Global Research

- Ireland in the top 20 countries in global rankings for the overall quality of scientific research (since 2009), moving up to 16th place in 2014 and 14th place in 2015. Field specific global excellence:
 - 2nd for **Chemistry**
 - 2nd for **Nanotechnology**
 - 2nd for **Immunology**
 - 3rd for **Animal & Dairy**
 - 3rd for **Agricultural Sciences**
 - 4th for **Materials Science**
 - 4th for **Mathematics**
- Ireland ranked 7th in the world by the Global Innovation Index 2016
- Ireland highlighted as one of five up and coming countries in the world to watch for scientific research excellence (Nature Journal, 2013)



Ireland's Standing in Global Research & Innovation

1. Pitchbook Universities Report 2015/2016 (**top global programmes producing VC-backed entrepreneurs**)
Europe Ranking:

1. **Trinity College Dublin**
2. University of Oxford UK
3. University of Manchester UK
4. **University College Dublin**
5. University of Cambridge UK
6. London School of Economics
7. Copenhagen Business School
8. Imperial College London



2. **Trinity College Dublin** has the highest % of cited patents of any European University (Reuters 2016)
3. More top 100 Innovative Universities per capita than any other European Country (Reuters 2016)
4. H2020 Champions Four universities in Ireland (NUIG, UCC, UCD, TCD) in the top 50 (out of 8,000) at securing competitive EU Horizon 2020 funding (World University News 30th October 2015)
5. Most R&D efficient country in EU, achieving maximum innovation output per Euro of public funding (Eurostats)
6. Small enough to collaborate and test, large enough to scale and succeed (Ireland as a Test Bed)

Agenda 2020 – SFI's Strategic Plan



Agenda 2020

1. To be the best science funding agency in the world at creating impact from excellent research and demonstrating clear value for money invested.
2. To be the exemplar in building partnerships that fund excellent science and drive it out into the market and society.
3. To have the most engaged and scientifically informed public.
4. To represent the ideal modern public service organisation, staffed in a lean and flexible manner, with efficient and effective management.

Science Foundation Ireland Strategy Deployment Map 2016

MISSION

Science Foundation Ireland will progress Ireland's society and economy by supporting the best scientific and engineering research while building an awareness of the role, impact and opportunities science creates.

AGENDA 2020 PILLARS

Create Impact from Excellent Research and Demonstrate Value for Money

Build Partnerships

Most Engaged and Scientifically Informed Public

Ideal Public Service Organisation

KPIs

SET 1

- No of disruptive discoveries
- Ratio jobs to €K invested
- RCs % targets met

SET 2

- No of industry contracts
- € Total cost share
- H2020 drawdown

SET 3

- No of PhDs funded
- No of events / people engaged
- Media exposure

SET 4

- % total budget on Admin
- Permanent / flexible staff ratio

STRATEGIC DELIVERABLES

Excellent Relevant Research, with Impact

Industry and Entrepreneurship

Talent & Skills

People and Workplace

Research Centres

International & National

Public Engagement

SFI VALUES

Excellence Passionate Collaborative Respect Progressive Integrity

SFI Strategic Deliverables

How our Programmes & Initiatives fit

Excellent relevant
research, with
impact

1. Investigator Programme (IvP)
2. Research Professorships
3. Future Research Leaders
4. Research infrastructure

Research Centres

5. Research Centres Programme

Industry &
Entrepreneurship

6. Strategic Partnerships
7. Research Centre Spokes
8. Technology Innovation Development Award (TIDA)

International &
National

Europe

9. ERC support & development
10. H2020: JTIs, ERANets. etc

US

11. US-Ireland partnership (NSF & NIH)
12. NSF partnership –GROW, PIRE, ICORPS

UK

13. DEL NI (under IvP)
14. Wellcome Trust partnership
15. Royal Society partnership
16. BBSRC partnership
17. EPSRC partnership (*in development*)

China

18. NNSFC Partnership (IvP)

Talent & Skills

19. Discover Primary Science and Maths
20. Smart Futures
21. Junior Cycle for teachers CPD support
22. PhD Studentships (*in development*)
23. Starting Investigators Research Grant (SIRG)
24. Career Development Award (CDA)
25. Industry Fellowships
26. SFI Fellowships

Public
engagement

27. Discover programme
28. Conferences & Workshops
29. Challenge-based funding (*in development*)

SFI Research Centres Programme

Key objectives:

- To develop a set of world-leading, large-scale research centres that will provide major economic impact for Ireland
- Achieve, maintain and enhance research excellence and leadership
- Increase the level of industrial and commercial investment in R&D activities with existing Ireland-based companies
- Attract large Foreign Direct Investments in corporate R&D centres
- Spin-out new, high-tech start-ups
- Leveraging of non-Exchequer funding

SFI Research Centres

- Largest ever state/industry co-funded research investment in Ireland
- €350m of new Exchequer funds from SFI for **12 World Class Research Centres** over 6 years
- **€190m** co-investment by over **250** industry partners
- Supports key growth areas targeted in the NRPE and Action Plan for Jobs
- Targets research into major social challenges, including Health and Energy
- Directly supporting **1300** top-class researcher positions
- Leading in **Horizon 2020** programmes
- KPI driven
- Leading SFI's **Education and Public Engagement** Agenda
- State of the art **Infrastructure**
- Virtual, **multi-institutional**, multi-disciplinary Centres

SFI Research Centres

7 funded in 2013, 5 funded in 2015, New Call 2016/2017

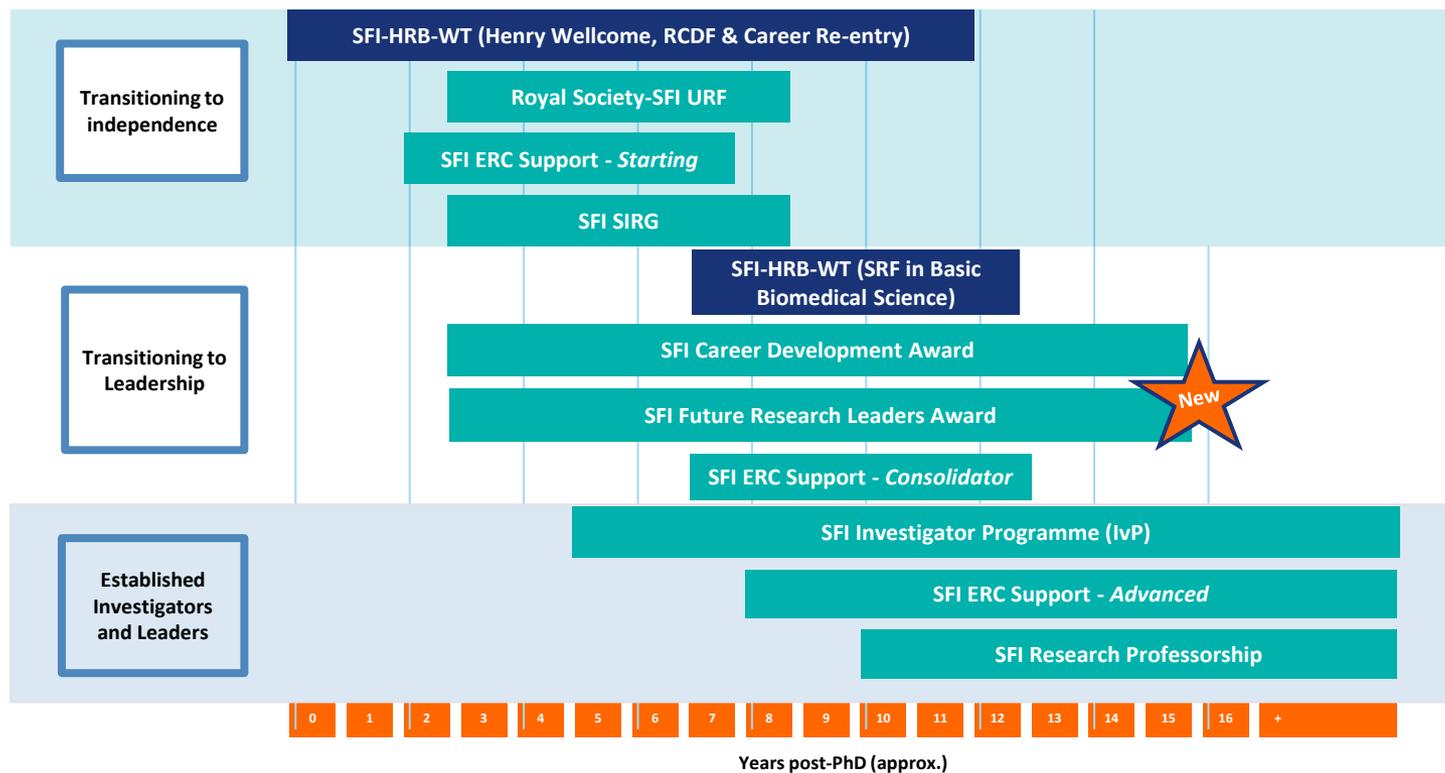
- ADAPT** – Centre for Global Digital Content and Engagement
- AMBER** – Advanced Materials and BioEngineering Research Centre
- APC** – Alimentary Pharmabiotic Centre
- CONNECT** – Future Broadband, Cellular and Internet of Things networks
- CÚRAM** – Centre for Research in Medical Devices
- iCRAG** – Irish Centre for Research in Applied Geosciences
- INFANT** – Irish Centre for Fetal and Neonatal Translational Research
- INSIGHT** – Centre for Data Analytics
- IPIC** – Irish Photonic Integration Research Centre
- LERO** – Irish Software Research Centre
- MaREI** – Marine Renewable Energy Ireland
- SSPC** – Synthesis & Solid State Pharmaceutical Centre

SFI Research Centres exceeding their KPI targets

➤ 7 x 2012 RCs over a 36 month period

		Cumulative	
		Target	Result
Academic	Journal Publications	1,012	1,841
	Conference Publications	719	943
Human capital	MSc/MEng Graduates	37	28
	PhD Graduates	36	107
	% Trainee departures with industry as first destination	28.9%	24.5%
Europe	Participations in major EU initiatives	72	70
	Coordinations in major EU initiatives	22	24
	ERC awards granted	9	11
	Funding from non-exchequer, non commercial sources	€53,500,000	€58,127,468
Industry co-fund	Cash in Bank (Minimum Target)	€10,443,574	€13,994,787
	% Industry cost share (cash)	10.0%	13.4%
	% Industry cost share (Total)	30.0%	27.8%
Entrepreneurial	EI commercialisation awards	58	177
	Licence agreements	24	61
	Spin out companies formed	4	10

Researcher Career Development



Investigator led Research

- Investigator Programme IvP
- IvP partnership with China (NNSFC)
- UK – BBSRC partnership
- UK – EPSRC partnership
- US-Ireland partnership (NSF, NIH)
- Wellcome Trust partnership

Programmes for Industry

SFI Industry Fellowship

Personnel Exchange



SFI Partnerships

Collaborative research projects of scale



SFI Research Centres

Supports large scale Research Centres in areas of economic importance

SFI Spokes

Supports growth of Research Centres

SFI Partnerships

- Flexible mechanism to support ambitious research projects of scale between industry and academia
- Flexible models of collaboration
- SFI matches the investment by industry (or other non-exchequer sources)
- **Competitive Partnership Programme**
- **Strategic Partnerships**

<http://www.sfi.ie/funding/funding-calls/open-calls/sfi-partnerships.html>

SFI Pfizer Biotherapeutics Innovation Partnership



- A novel approach to public / private **open innovation**
- Identification of novel biotherapeutics directed at novel disease pathways
- Immunology, oncology, neuroscience, rare diseases
- Pre-clinical testing of candidate biologics
- Validation of a potential drug candidate that can advance into clinical testing

THE IMPACT: Increased employment at Pfizer Grange Castle

- Researchers previously trained on SFI awards employed by Pfizer
- New cohort of academic researchers trained in industry-relevant skills
- Engagement with corporate headquarters – triggering further expansion, etc.
- Long term – development of novel biotherapeutics treating unmet needs

AbbVie Partnership



€10M investment by SFI and AbbVie in early stage drug discovery and diagnostics projects

Blood Cancer Network Ireland



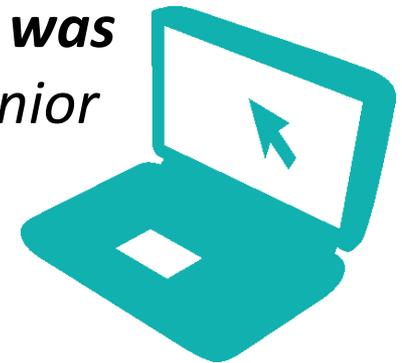
A €5M investment by the Irish Cancer Society, SFI and industry in a new clinical research network for blood cancers, led by Prof. Michael O'Dwyer (NUIG)

SFI Industry Fellowship

- Fellowship to support
 - An academic researcher wishing to spend time in industry
 - Industry personnel wishing to spend time in academia in Ireland
- Focus on collaborative research
- Up to one year full time or two years part time
- Open to Irish and international companies

Industry Fellowship Awards

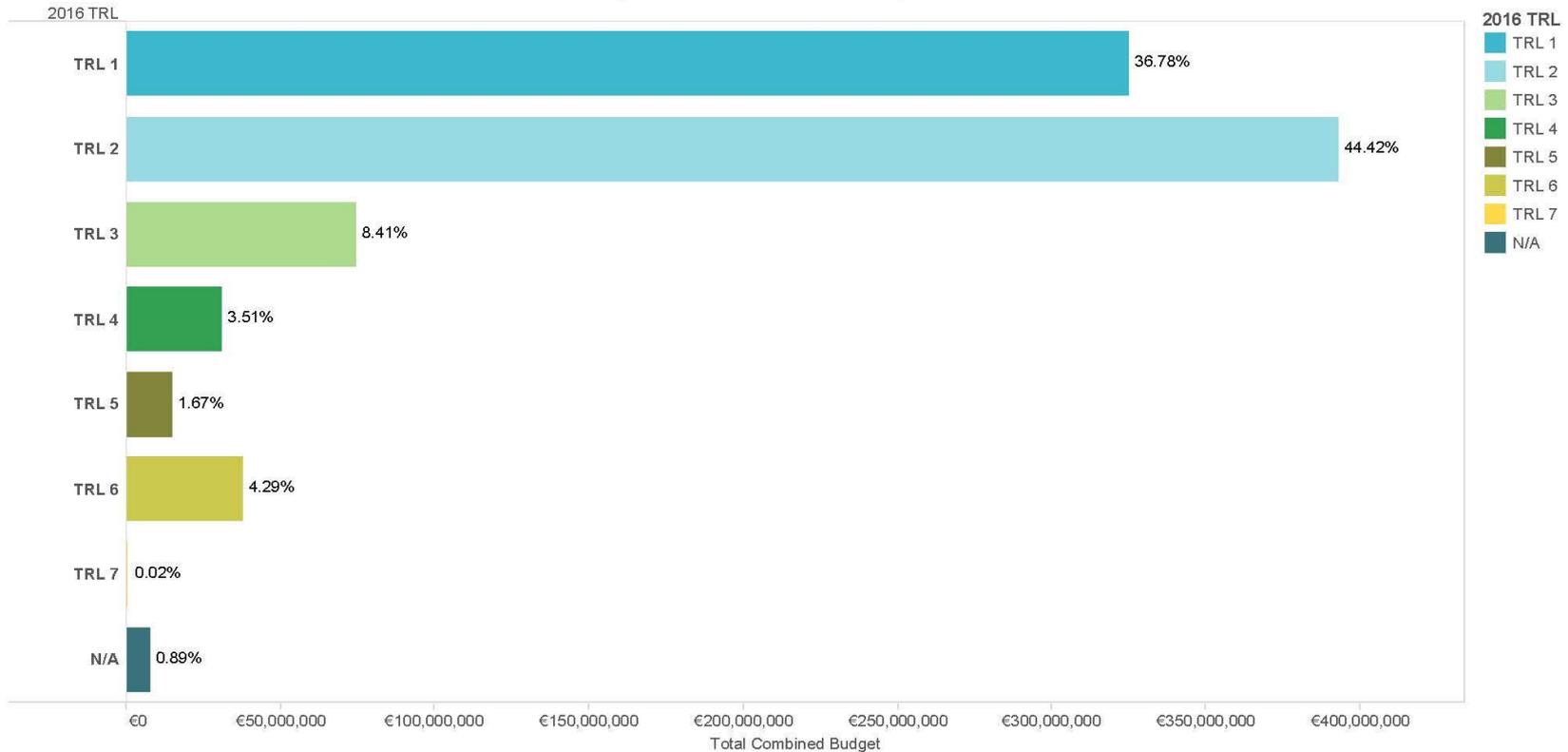
*“The SFI Industry Fellowship Award gave me the **perfect chance to experience the industry world** and decide if it was a world I would see myself being part of. I spent a year in the R&D department of a big pharmaceutical company and learnt a lot of things and thought the environment was thrilling. **After the fellowship I was offered a job in the company** and I am now a Senior Research Scientist”*



2013 Industry Fellowship Recipient

TRL Analysis

Percentage of Total Live Investment by TRL



Sum of Total Combined Budget for each 2016 TRL. Color shows details about 2016 TRL. The marks are labeled by % of Total Total Combined Budget. The data is filtered on Expiry Date, which ranges from 01/01/2016 to 30/11/2021.

Innovation 2020



Key Investment Targets

By 2020:

- Ireland's Research & Development intensity to 2.5% of GNP (approx. doubling of budget; one third public, two thirds private)
- Increase number of researchers in enterprise to 40,000
- Increase annual Masters and PhD enrolments by 500 to 2,250
- Double private investment in R&D within the public research system
- Further develop the network of SFI Research Centres
- Infrastructure investment
- Increased participation in international research organisations

Challenge Based Funding

Seeking Insights & Ideas from Different Places



From Nesta

Prize and Challenge Funding

- Prize – cash, change in government policy/law, guaranteed purchase
- Stage-Gate Funding
- Draws in a wider group of innovators
- Feedback
- Training
- Networking, collaboration, dynamic teams
- Community/public engagement and interest
- Impact is defined up front : major payment on delivery



Thank You