AESIS

NETWORK FOR
ADVANCING & EVALUATING THE SOCIETAL IMPACT OF SCIENCE

4 - 6 November

We welcome you to

Ministry of Science and Higher Education

Republic of Poland

Impact of Science

AGH

Technote

VERTIGO VENTURES

NON SOLUS

ELSEVIER

researchfish
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ISI

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AESIS – Impact of Science Opening Session

David Sweeney, Research England
4 November 2020

Research Strategies

- What are you trying to achieve? What will success be?

- In UK – traditional academic excellence but with societal and economic impact

- All disciplines? Or Targetted?

- All areas of society – economic, social, cultural? Or targetted?

- A homogeneous system, or different incentives for different research organisations?

Assessing Success

- Apples and Oranges? Comparing things with no basis for comparison?

- What can numbers (measurements) tell us and what can they not tell you?

- Indeed where are measurements actually unhelpful as they cause perverse incentives?

- Insights and Assessement

Why Research Assessment?

- Accountability for Public Investment

- Allocate public funding

- Benchmarking

- Evidence for investment by others

- Performance incentives

- Influencing cultures and behaviours (e.g. Impact, Open Science)

UK RI Research England

The Conference

- Learn from others

- International Comparisons

- Views of different parties – government, researcher, 'user' of research

- Stimulate discussion and debate

- Enjoy, ask questions, meet people
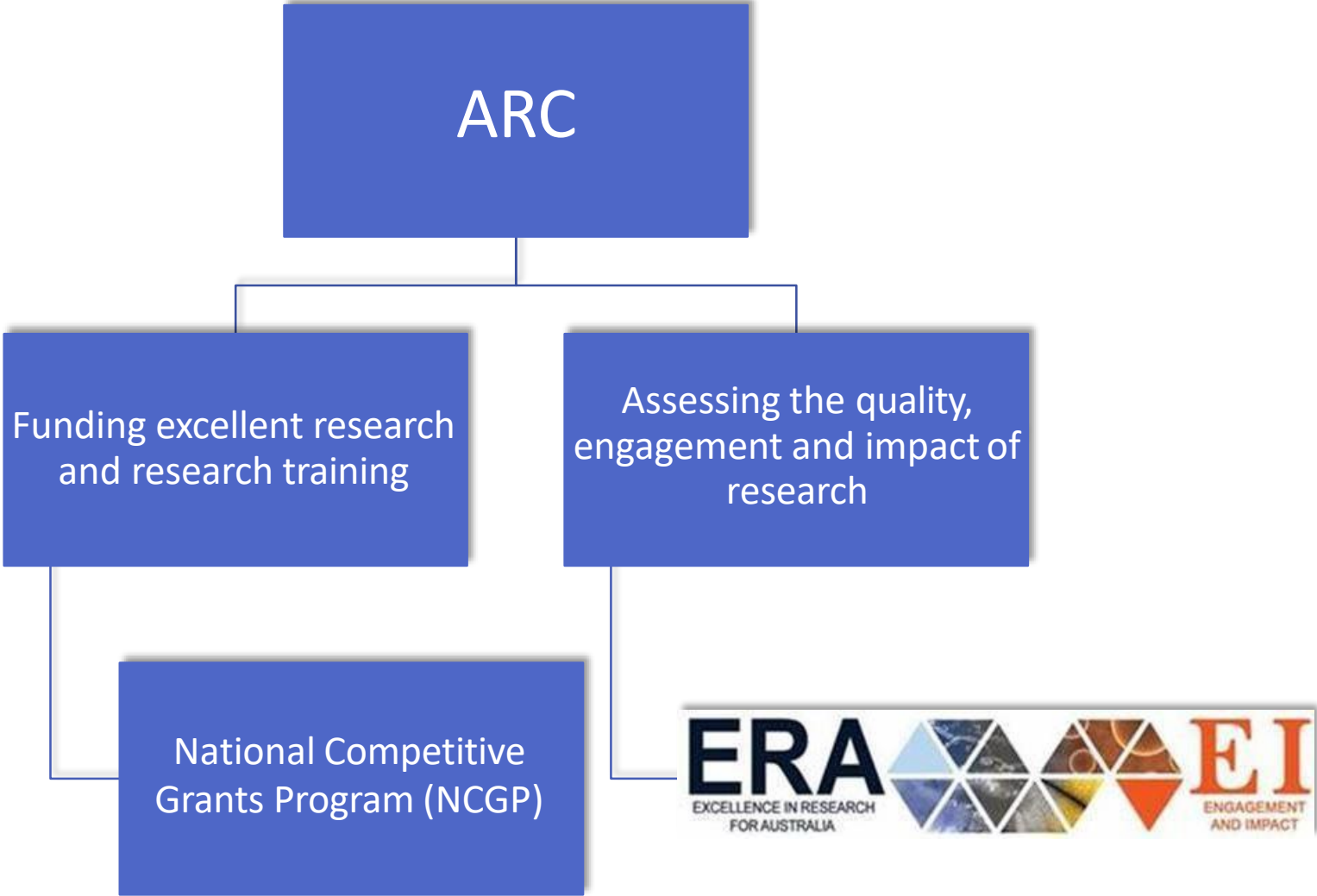
UKRI Research England
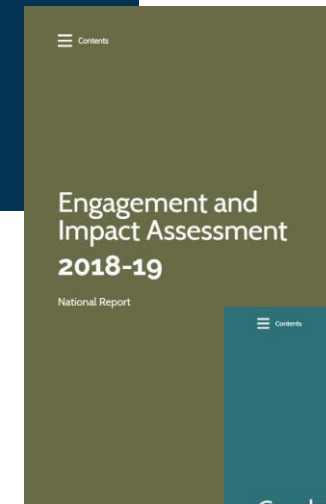
Australian Government

Australian Research Council

Engagement and Impact Assessment

ARC Responsibilities

ERA and EI Outcomes Published

EI 2018 Framework
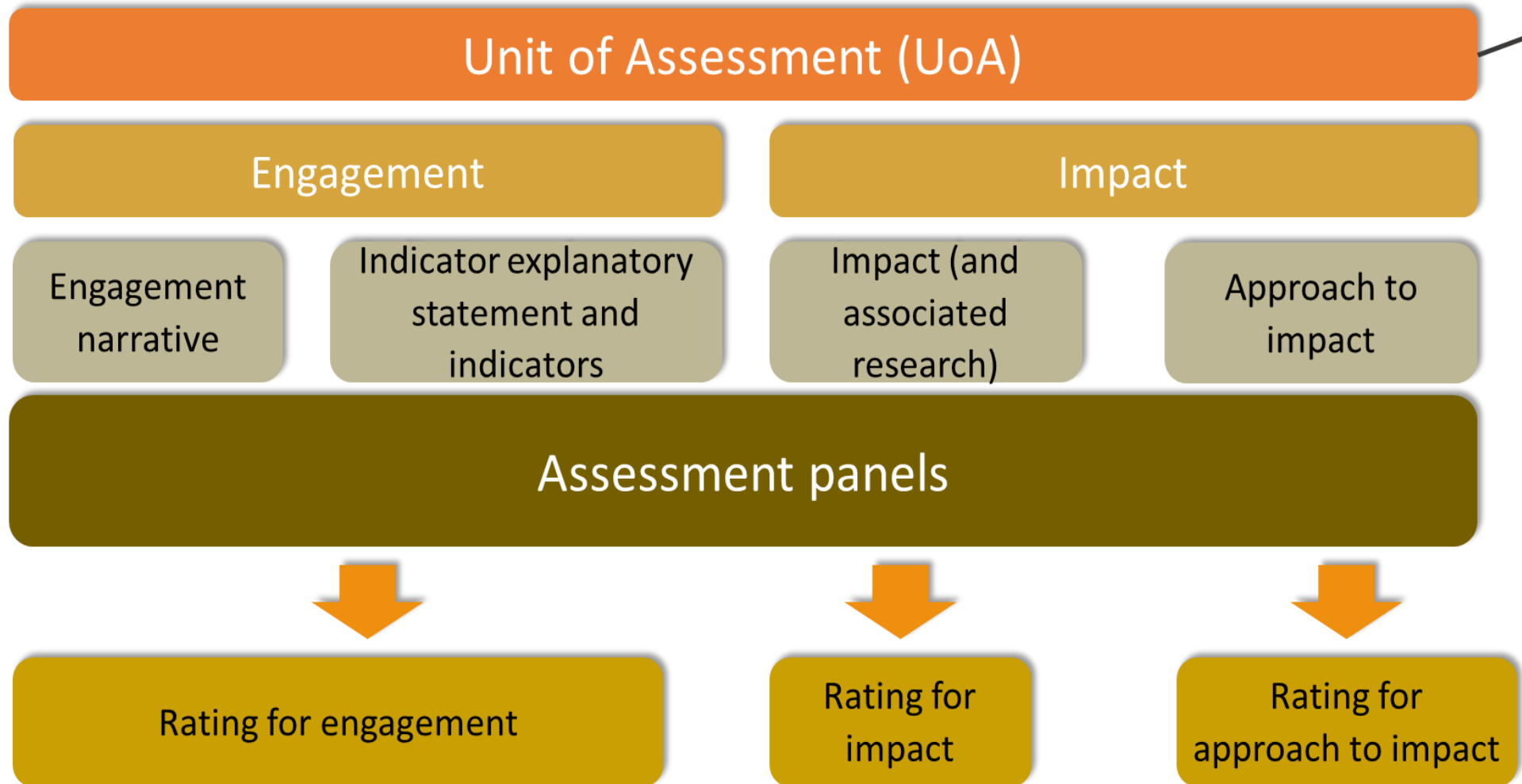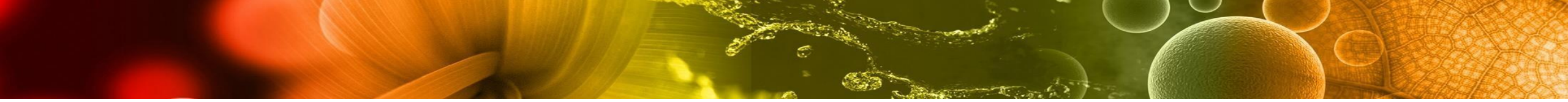
EI Findings
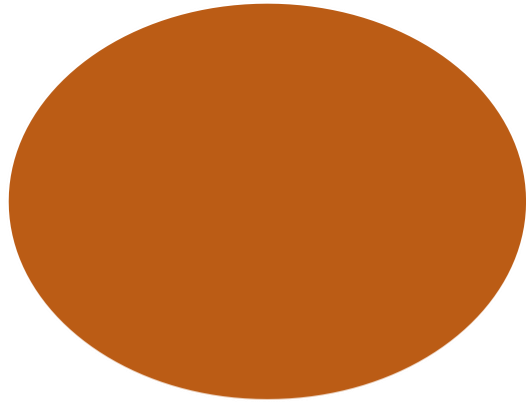
Rich *new* national resource
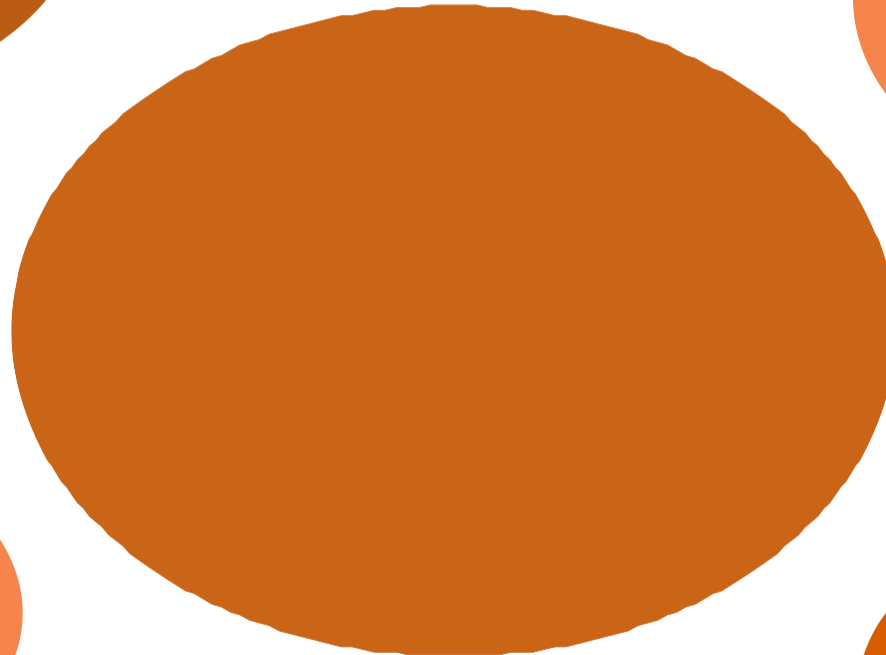
Benchmark of performance

Examples of enabling institutional processes and infrastructure

ERA and EI Review

- Simplify and streamline
- Take advantage of technology and big data
- Reflect world's best practice
- Respond to needs of university sector, government and public

End-user engagement

- Focused on <u>research</u> engagement
- Emphasis on bi-directional benefit
- Could increase end-user awareness of and engagement with EI

Metrics and Narratives

- Evidence vs indicators
- Metrics should be flexible
- Metrics and narratives support each other

ERA-EI Review: Lessons So Far

Training

- Panel members (Academic and end-user)
- Institutions

Reporting burden

- Balance costs and benefits
- Narratives valuable but time-consuming to write

Questions:

ARC-EI@arc.gov.au

Thank you

www.arc.gov.au

Definitions

Research is the creation of new knowledge and/or the use of existing knowledge in a new and creative way to generate new concepts, methodologies, inventions and understandings. This could include the synthesis and analysis of previous research to the extent that it is new and creative.

Aboriginal and Torres Strait Islander Research means that the research (as defined above) significantly:

- relates to Aboriginal and Torres Strait Islander peoples, nations, communities, language, place, culture or knowledges, and/or

- is undertaken with Aboriginal and Torres Strait Islander peoples, nations, or communities.

Research impact is the contribution that research makes to the economy, society, environment or culture, beyond the contribution to academic research.

Research engagement is the interaction between researchers and research end-users outside of academia, for the mutually beneficial transfer of knowledge, technologies, methods or resources.

A **research end-user** is an individual, community or organisation external to academia that will directly use or directly benefit from the output, outcome or result of the research.

EI 2018 Ratings
All universities

Engagement Ratings
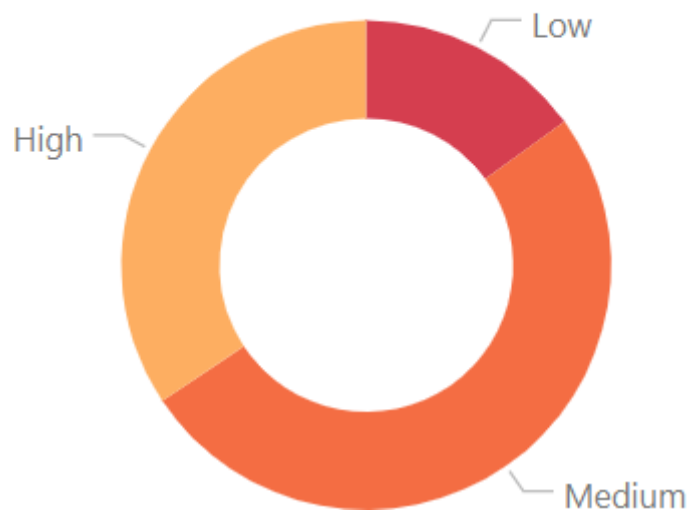
High	Medium	Low
34%	51%	15%

Approach to Impact Ratings
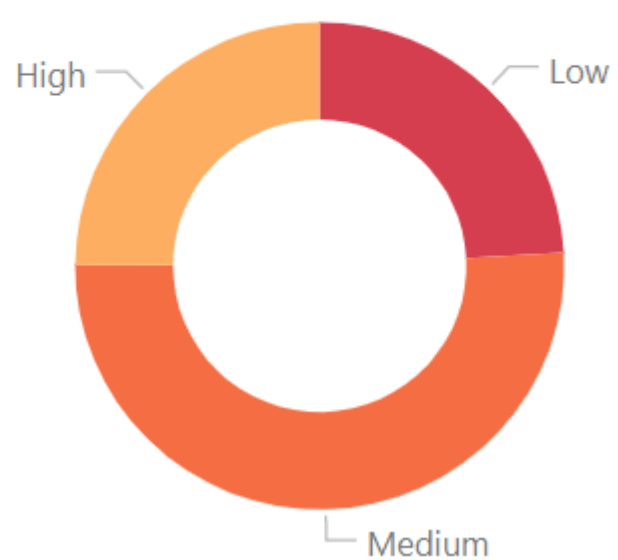
High	Medium	Low
25%	51%	24%

Impact Ratings
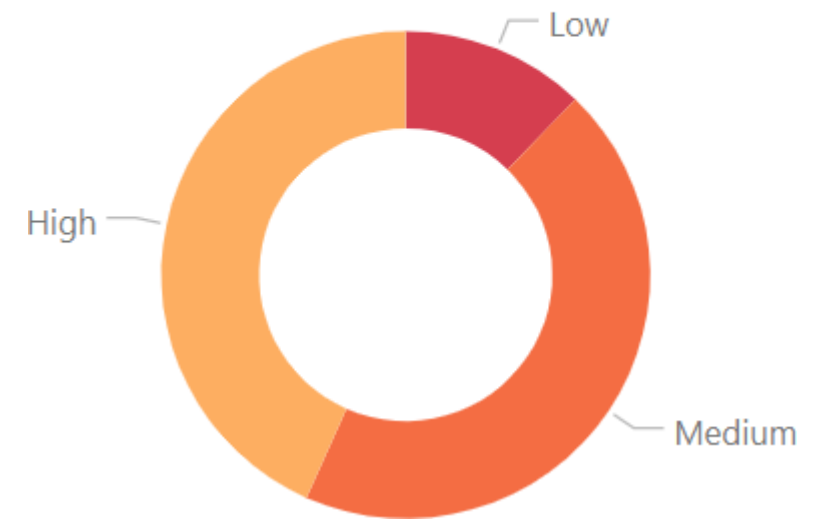
High	Medium	Low
43%	44%	12%

Percentages may not total 100 due to rounding

Insights from EI 2018

Many pathways to impact

Impact occurring in many research areas and in different ways

Many types of collaborations

Image source: creative commons

COVID-19 impact on Australian universities

- **Economic impact**
  - $3.1-4.8 billion loss by end of 2020
  - $16 billion loss by end of 2023
  - Loss of 21,000 FTE jobs including 7,000 FTE in research
- **Workforce equity issues**
  - Women, early career researchers and graduates may disproportionately experience negative impacts
- **Publishing practices (international)**
  - Growth in pre-prints, publications and open access
  - Accelerated peer-review
  - Changed citation practices

Committee for Science Evaluation (CSE)

31 persons (active scientists) in close cooperation with Ministry of Science and Higher Education as well as scientific and academic communities in Poland

CSE (KEN)

Evaluation of research quality

Evaluation of editors of scientific monographs as well as scientific journals and peer-reviewed materials from international conferences

Evaluation of doctoral schools

Ad hoc teams and working groups
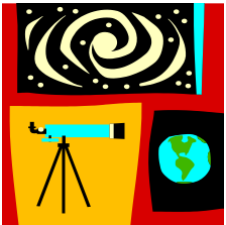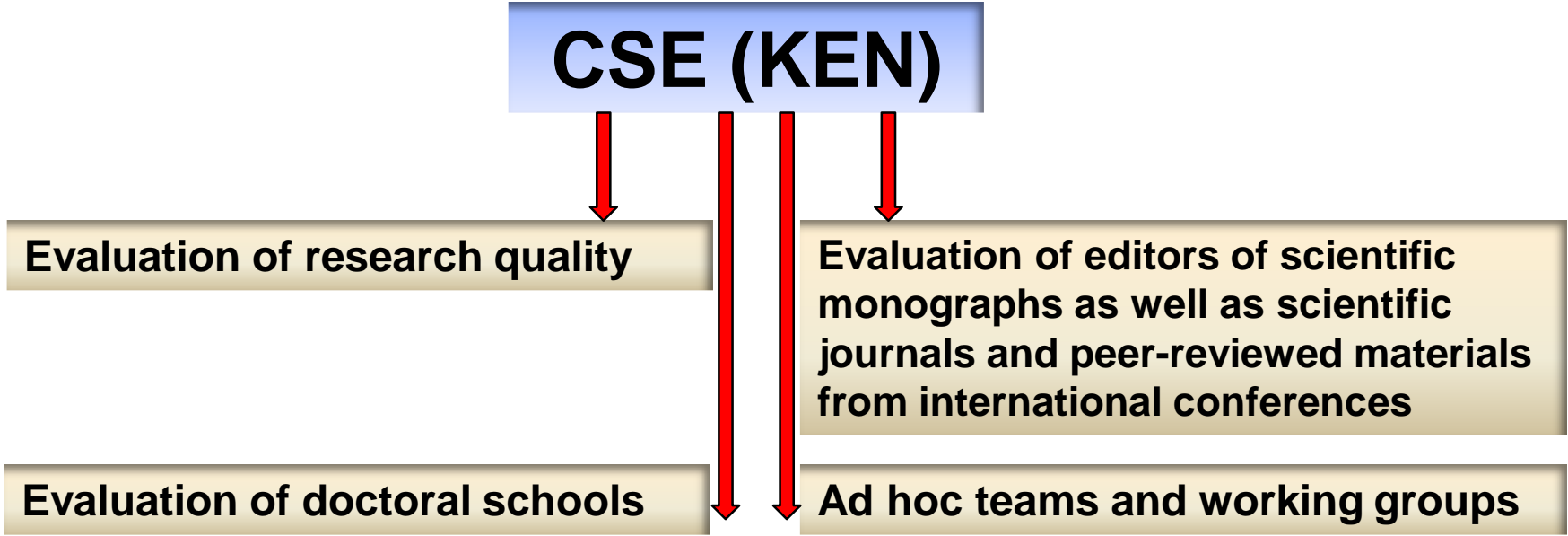
Searching for inspiration

France: institutional evaluation, HCÉRES

Germany: higher education rankings, assessment of research funding programs (DFG)

Italy: Research Evaluation Exercise (VQR)

Netherlands: evaluation to standard protocol (SEP)

UK: the Research Excellence Framework (REF)

Australia: Excellence in Research for Australia (ERA)
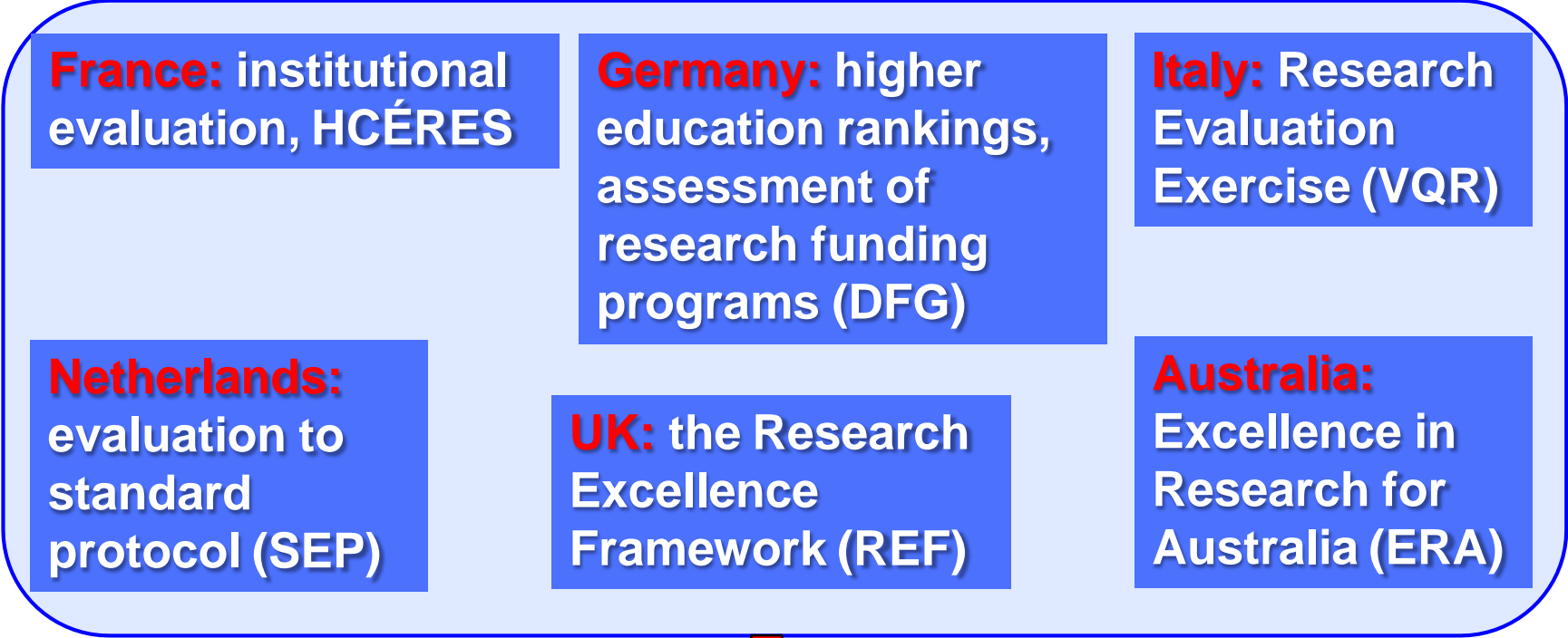
Poland has own experience in research assessment (evaluation & categorization) performed since 2009

3

Previous research assessments in Poland: nearly 1000 research units
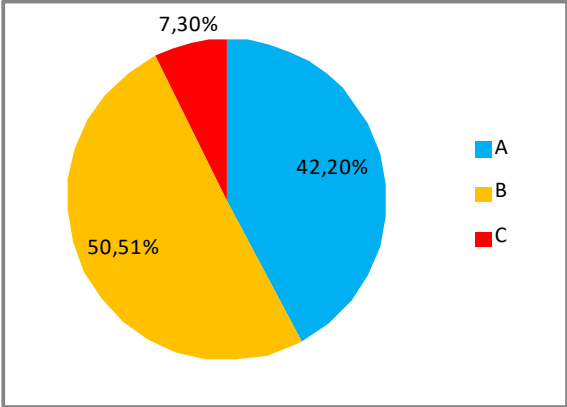
2009 Basic approach
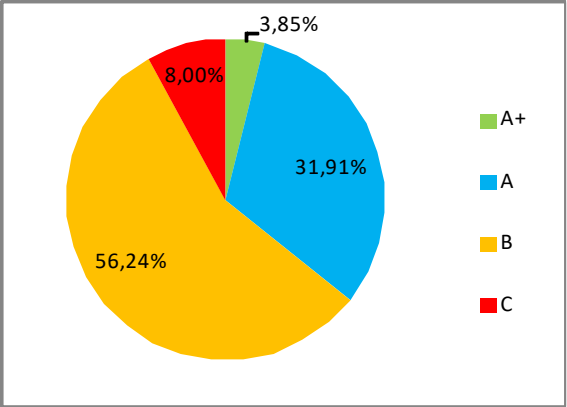
2013 Qualitative change
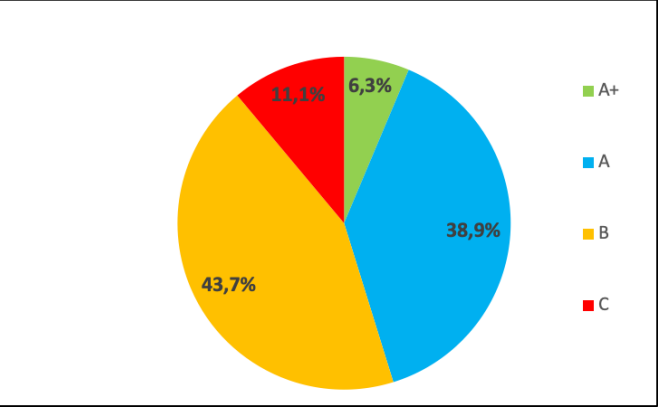
2017 Improved evaluation

Category	2013	2017
A+	3,8 %	6.3 % ↗
A	32 %	39 % ↗
B	56.2 %	43.7 % ↘
C	8 %	11 % ↗

Evaluation models

Degree of parametrization

Expert system

Mixed system

Parametric system

parametric criteria (K1, K2), and expert criteria (K3, A+)

New!
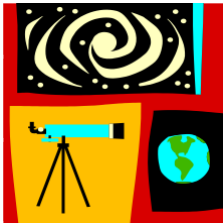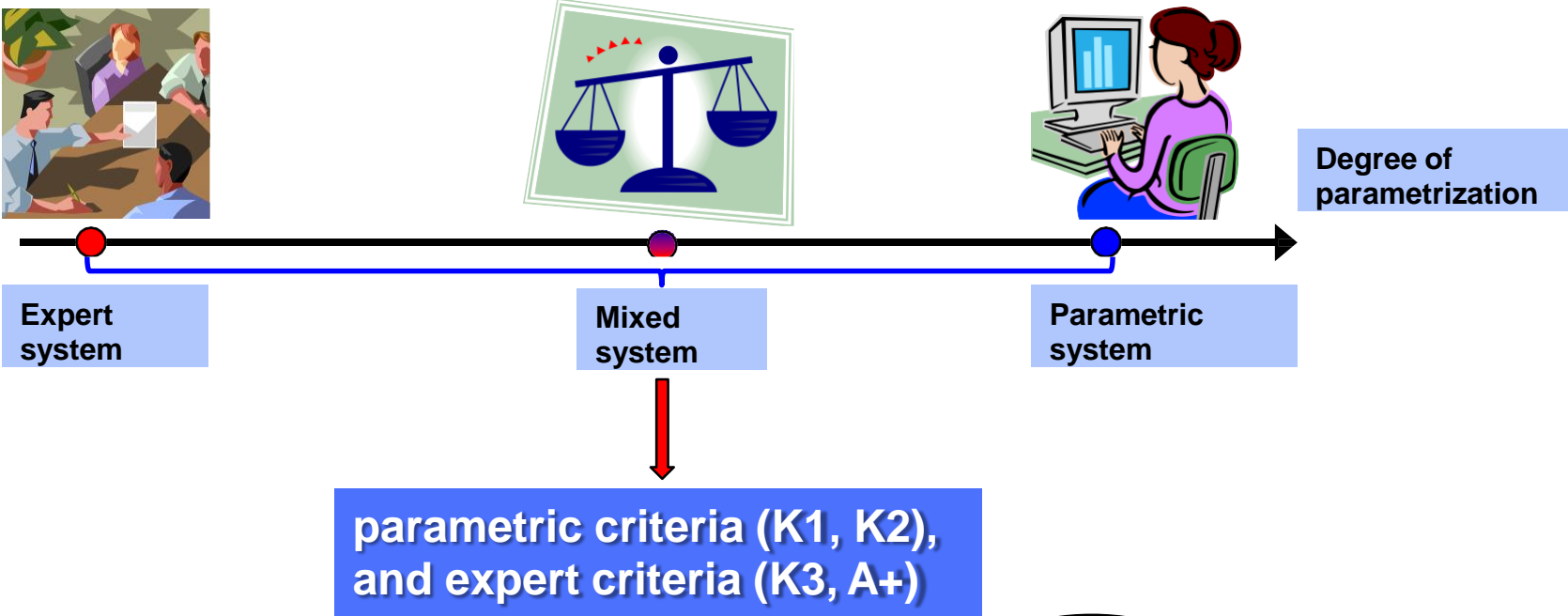
New category has been introduced: B+

The rights to award the PhD and habilitation degrees depend on the category (are granted as from B+). New!

Act 2.0 Constitution for Science

Art. 265. 4. The evaluation is carried out within a discipline of science New ! **at the unit employing on December 31 of the year preceding the evaluation at least 12 employees conducting research in this discipline, ...**

A breakthrough in the evaluation concept!

Evaluation of excellence in research

Academic unit - university					
	Faculty 1	**Faculty 2**	**Faculty 3**	**Faculty 4**	**…**
Discipline 1					
Discipline 2					
Discipline 3					
Discipline 4					
…					

The evaluation conducted so far was focused on the organizational entities – the faculties.

New!

The current assessment concerns groups of researchers , representing the same discipline of science, transversal with respect to the faculties. Some 1500 groups of researchers are anticipated.

Stage I: evaluation

K1: scientific or artistic level of conducted activities (papers, monographs, patents);

K2: financial effects of scientific research and development activities (research projects);

New!

K3: impact of scientific activity on the society and economy (impact descriptions).

Stage II: categorization
reference values: **RA**, **RB+**, **RB**;
categories of excellence in research: **A+**, **A**, **B+**, **B**, **C**

K1, K2: the measure of research effectiveness:

$$E = \frac{S}{N}$$

$S = \sum points$ - sum of points scored for research activities;

$N = \sum researchers$ - number of persons involved in the research activities.

The measure is **institutional**, i.e. it is applied to a **group of researchers**, representing **discipline** of science in the evaluated unit.

Reference values RA, RB+, RB

1. **the achievements**

    K1, K2

2. **the   position**

    bibliometric databases

Comparison of achievements in the discipline X at a given unit, with the reference values R_i:

$$K1: \quad E_1(X) \leftrightarrow R_1 \rightarrow P_1$$
$$K2: \quad E_2(X) \leftrightarrow R_2 \rightarrow P_2$$
$$K3: \quad S_3(X) \leftrightarrow R_3 \rightarrow P_3$$

The evaluated discipline scores points P_1, P_2, P_3 within the range $\langle -1, +1 \rangle$
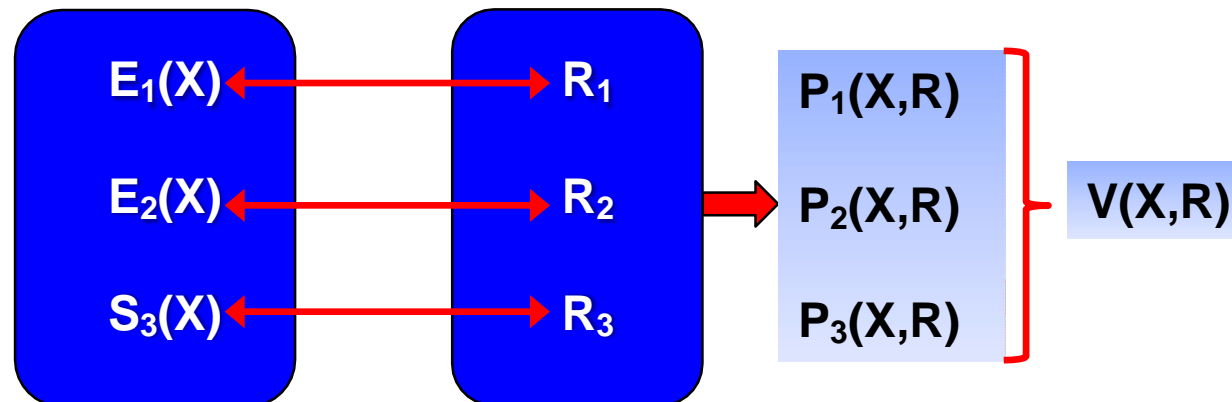
Total score V(X,R) resulting from comparison of discipline X with the reference values R:

$$V(X,R) = W_1 \times P_1(X,R) + W_2 \times P_2(X,R) + W_3 \times P_3(X,R)$$

Criterion (K_i)	Weight function (W_i) [%]			
	Fields of: humanities, social sciences, and theological sciences.	Fields of: exact and natural sciences, medical and health sciences	Fields of: engineering and technical sciences, agricultural sciences	Field of art: artistic disciplines
K1: scientific or artistic level of conducted activities	70	60	50	80
K2: financial effects of scientific research and development	10	20	35	-
K3: impact of scientific activity on the society and economy	20	20	15	20

Category A+ (top level)

I Necessary conditions for category A+:

- qualifies for **category A**,

- obtains in **K1** score higher than a **percentage threshold (at least 80%)** of the highest score in the discipline.

New!

II Sufficient conditions for category A+:

- **international** importance of scientific achievements (K1),

- **impact** of scientific achievements (K1) on development of civilization,

- **quality and effects** of scientific activity compared to leading European research centers.

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Polish research assessment exercise is in many aspects compatible with the exercises performed in Europe.

Thanks to the evaluation and categorization, Poland has gained visibility in the international research space.

Citable documents (SJR)
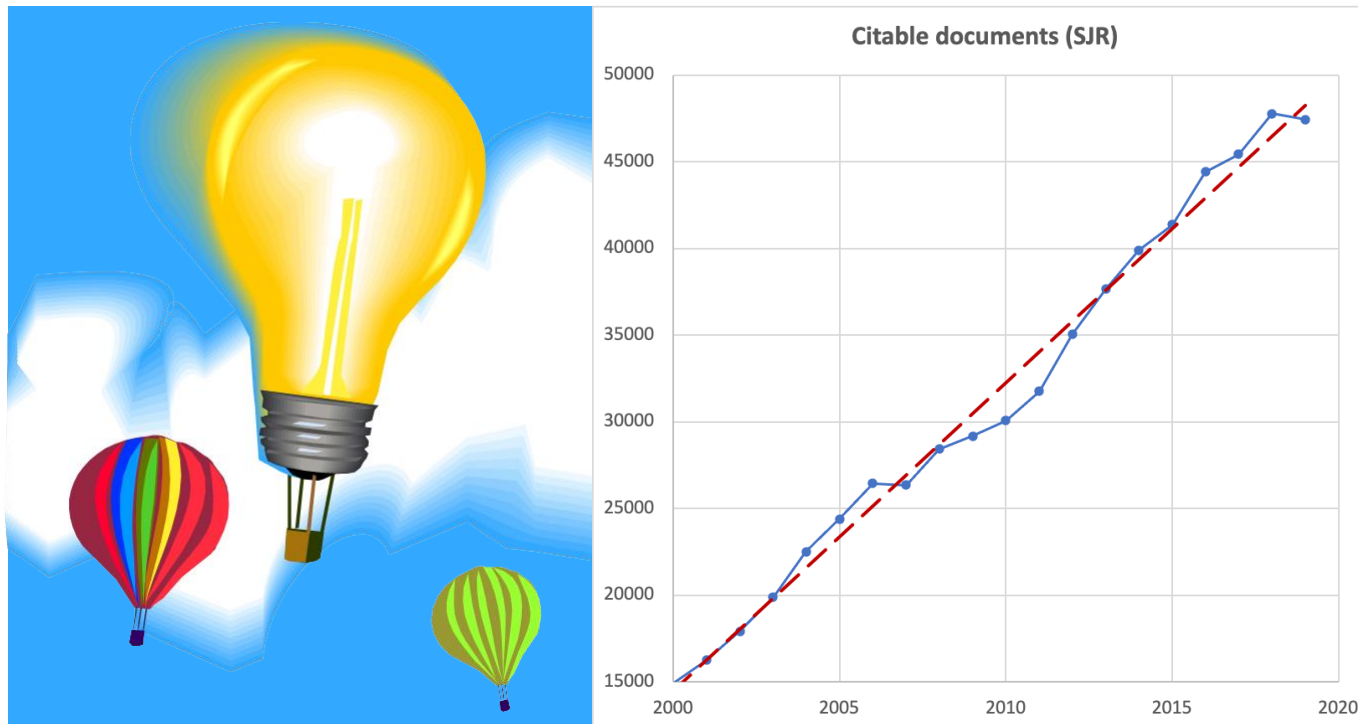
Thank you for your kind attention

Science Foundation Ireland (SFI)

Key Information

Founded in
2000

Officially established in
2003

770
Live Awards with future commitments totalling €624m
as at 31 Aug 2020

€2.7bn
Spend
€3.3bn
Committed to date

222m
of external funding
secured in 2019

Science
Foundation
Ireland **sfi**
For what's next
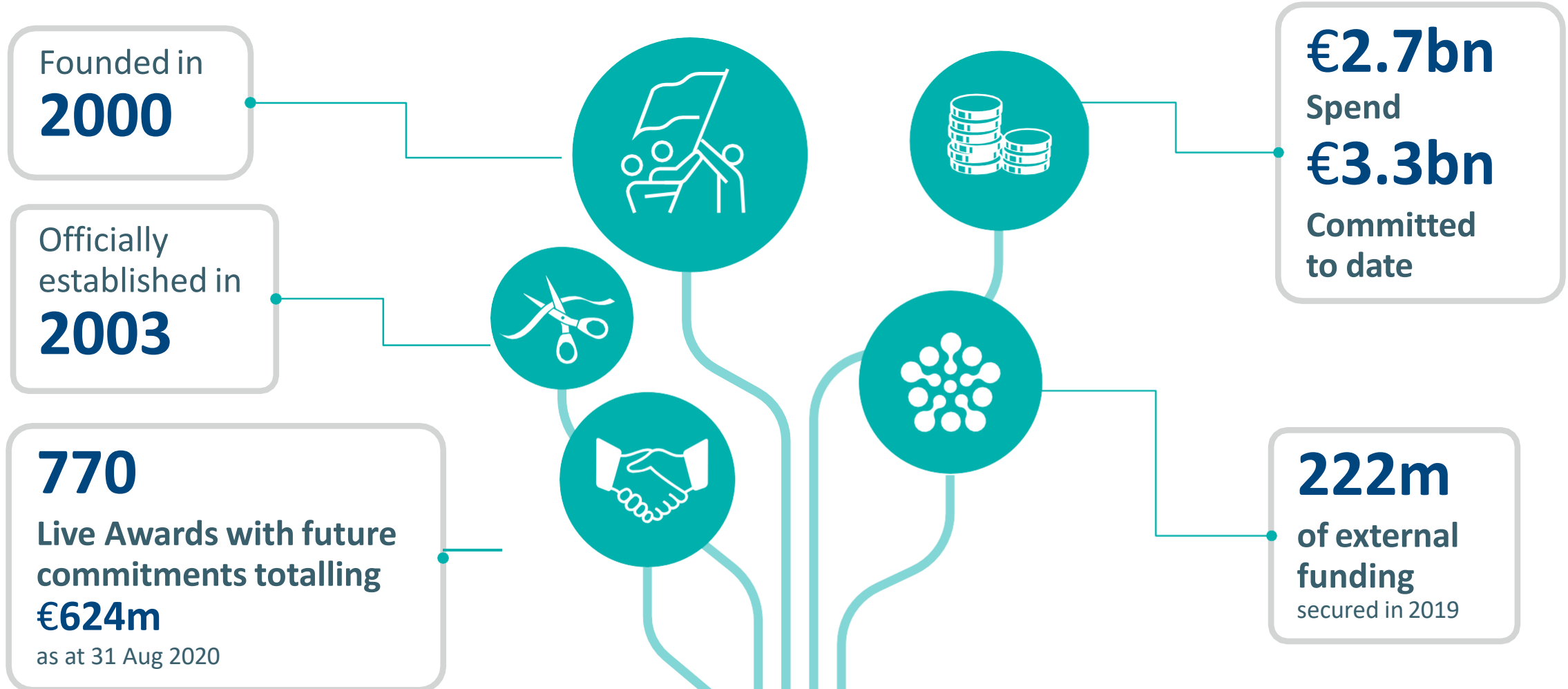
Innovation 2020

SFI Agenda 2020
Excellence and Impact

Science Foundation Ireland — **SFI** — For what's next

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
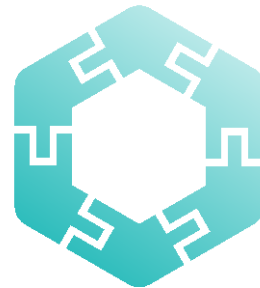
3 To have the most engaged and **scientifically informed public**

4 To represent the **ideal modern public service organisation**, staffed in a lean and flexible manner, with efficient and effective management.

Small Advanced Economies Initiative

- **Collaboration of seven advanced economies of similar scale / population**

  Ireland, New Zealand, Finland, Israel, Denmark, Singapore;
  later joined by Switzerland

- ***"Broadening the Scope of Impact: Defining, assessing and measuring impact of major public research programmes, with lessons from 6 small advanced economies"* (2015)**

  https://www.sfi.ie/resources/SAEI_Impact-Framework_Feb_2015_Issue2.pdf

Impact and Excellence Concept

Impact can be described as **"the demonstrable contribution that excellent research makes to the economy and society"**.

Excellence

Ensuring **Quality/Excellence** both of the person and of the proposed programme via International Peer/Merit Review

Impact

Increase focus on applicants **demonstrating and delivering impact from research** due to an absolute need to demonstrate to government and the public, **the value to the Irish economy and society of public funds spent on research**

Short-term or Long-term	**Difficult to measure**
Economic / Non-economic	**Non-linear**

How does SFI measure Impact?

Impact Statement:
- Researcher articulates the planned and potential impact of the proposed research at the application stage.

International Peer Review of Scientific Excellence and Impact

Annual Reporting:
- Impact Declarations selected.
- Award holder provides supporting metrics and narrative in support of impact declaration

Midterm Review of Impact Statement

Case Studies: Provide a "picture" of Impact

A 'picture' of impact

- *Genable Technologies*, Irish biopharma company, spun out of research by Jane Farrar, Pete Humphries and Paul Kenna in ocular genetics in Trinity College Dublin - developing new gene therapies to treat most prevalent forms of inherited retinal disease (IRD) – bought by *Spark Therapeutics.*

- This research underpinning this spin out was supported by multiple sources including **Science Foundation Ireland**, the Health Research Board, Fighting Blindness Ireland, Foundation Fighting Blindness (USA), Enterprise Ireland, the Wellcome Trust, the European Research Council (ERC) and EU framework programmes

The Impact:

This transaction with *Spark Therapeutics* will progress the clinical development of RhoNova™ for the treatment of autosomal dominant rhodopsin linked retinitis pigmentosa (RHO-adRP), a leading cause of inherited blindness.

San Francisco Declaration on Research Assessment

Do not use journal-based metrics, such as Journal Impact Factors, as a surrogate measure of the quality of individual research articles, to assess an individual scientist's contributions, or in hiring, promotion, or funding decisions.

How are applications to SFI assessed?

- Most SFI Programmes have three areas of assessment:

  - Quality of the applicant/s

  - Quality of the research proposal

  - Strength of the impact statement

- These 3 areas are usually equally weighted to form the final score

- By implementing **DORA**, how SFI assesses the quality of an applicant has evolved, by bringing the broader impacts of an applicant's research history to the fore

- As such we guide reviewers to take a more holistic view of an applicant's achievements

DORA: What changes did we make?

- Reviewed SFI's existing CV template – under 'key achievements and research excellence'

- Integrated 4 'modules' from *Resume for Researchers*:

  1. Generation of Knowledge

  2. Development of Individuals

  3. Contributions to the Wider Research Community

  4. Contributions to Broader Society

- Use of metrics not permitted (*except citations)

     – applications can be deemed ineligible for review if included

- Section to describe relevant publications and their (individual) impact

Outcome / Experience to date

- We see the implementation of DORA, and changing the culture of research assessment, as an iterative process

- We will identify challenges and adapt our evaluation processes to address these

- Data gathered from this new applicant evaluation process will help to determine what next steps to take

Resources

Resume for Researchers (Royal Society):
https://royalsociety.org/topics-policy/projects/research-culture/tools-for-support/resume-for-researchers/

SFI Frontiers for the Future CV templates:
Applicant/Co-applicant CV - https://www.sfi.ie/funding/funding-calls/frontiers-for-the-future/2020-FFP-Applicant-Co-applicant-CV-template.docx
Collaborator CV - https://www.sfi.ie/funding/funding-calls/frontiers-for-the-future/2020-FFP-Final-Collaborator-CV-template_02.09.2020.docx

SFI Frontiers for the Future call document, which includes full review process and questions
for the applicant & reviewer: https://www.sfi.ie/funding/funding-calls/frontiers-for-the-future/SFI-Frontiers-for-the-Future-Programme-2020-Call-Document-(1).pdf

Thank you!

researchpolicy@sfi.ie

% of SFI supported publications in the top 1% as measured by citations

27

SFI funded researchers are in the 2019 list of highly cited researchers (top 1% in the world) produced by Clarivate Analytics

Country	Funder	# Documents in Web of Science	Documents in the Top 1%
Ireland	**All**	**199,485**	**1.72**
Ireland	Science Foundation Ireland	19,965	2.69
USA	All	10,447,502	1.79
USA	National Science Foundation	621,562	2.89
USA	National Institutes of Health	928,094	2.84
Switzerland	All	622,371	2.62
Denmark	All	347,909	2.44
Singapore	All	259,256	2.28
United Kingdom	All	2,923,058	1.85
Finland	All	267,927	1.79
New Zealand	All	193,064	1.82
Israel	All	313,277	1.66
China	All	4,587,043	1.13
EU	All	12,220,233	1.25
EU	European Research Council	85,960	4.57

Source: InCites by Clarivate Analytics
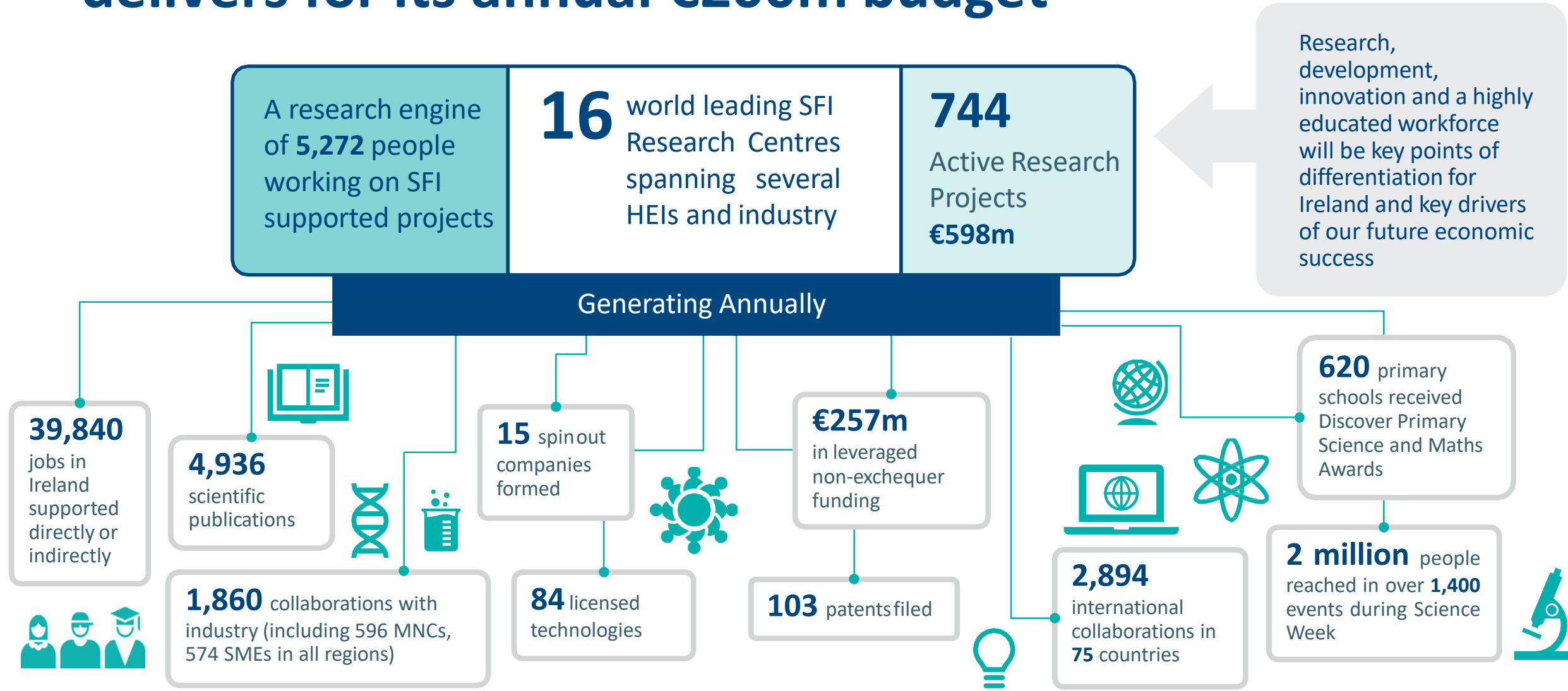
SFI Portfolio 2019 Analysis

Annual Capital Budget – 188 million Euro

SFI RESEARCH CENTRES 52%
- Spokes

ENGAGEMENT 1%
- Discover Programme
- Conferences and Workshops
- Science Week

INTERNATIONAL PARTNERSHIPS 3%
- SFI-NSFC Partnership
- US-Ireland R&D Partnership
- RS-SFI University Research Fellow
- BBSRC-SFI Joint Funding
- SFI-HRB-Wellcome Trust Biomedical Research Partnership

INDIVIDUAL LED 20%
- Investigator Programme
- Research Professorship
- Career Development Award
- Starting Investigator Research Grant
- President of Ireland Future Research Leader

TRAINING CENTRES 19%
- SFI Centres for Research Training

ENTREPRENEURSHIP 4%
- Strategic Partnerships Programme
- TIDA
- Future Innovator Prize

APPLIED & BASIC COMBINED – OUTSTANDING IDEAS – INNOVATION TALENT & SKILLS – ECONOMIC & SOCIAL IMPACT – PUBLIC ENGAGEMENT – EXCELLENT RESEARCH

FELLOWSHIP, EARLY CAREER SENIOR INVESTIGATOR

Science Foundation Ireland — For what's next

Up Next

11.30-12.45		
	Roundtable: Social Sciences & Humanities	Kościół Mariacki room
	Roundtable: Big Data Analysis & Impact	Tyniec room
	Approaches for Life Sciences and STEM	Smocza Jama room
	Assessment Approaches for SSH	Brama Floriańska room
	Data Analysis and CRIS	Nowa Huta room
	Institutional Impact Profile	Barbakan room
	Policies for Impact Evaluation	Sukiennice room

AESIS

#IoS20