“Forging ahead with Research”
Key Projects in the Action Plan of the Government Programme in Finland

Prime Minister Juha Sipilä’s Government’s objectives are to bring the Finnish economy onto a path of sustainable growth and higher employment and to safeguard sufficient financial resources for public services and social protection. The strategic objectives of the Finnish Government Programme were materialised in the form of 26 key projects.

Focus areas of the implementation plan:

1) Employment and competitiveness (5)
2) Knowledge and education (6):
   - Key project funding granted by the Academy of Finland was targeted to support early career researchers and the utilisation of research results.
   1) Wellbeing and health (5)
   2) Bioeconomy and clean solutions (5)
   3) Digitalisation, experimentation and deregulation (5)
“Forging Ahead with Research” – 30 M€ Key Project Funding for the Academy of Finland

• In total 30 M€ was allocated to the Academy of Finland to be shared through its’ research funding.
• Simultaneously, 59 M€ was allocated to Tekes (now: BF).
• 2016 call and granting of Key Project funding by AoF ”Forging ahead with Research”
• Due to tight schedule, pre-survey was sent to potential applicants to plan the new evaluation process
• Call Info Days were organised twice (AoF alone, AoF&Tekes) to better attract researchers – around 300 participants did register

• In addition, 30 m€ additional funding was allocated in 2017 by the government for the younger generation of researchers to be used for Academy projects and Postdoctoral projects
Key Project funding by the AoF (1/2)

Objective of the call
To increase the societal impact of research by targeting the funding at research promotion and utilisation

Researchers currently or recently (2015–4/2016) funded by the Academy of Finland (or a similar international agency)

Targeted call for these ongoing projects of a high scientific quality

What does the funding support?
Utilisation
Collaboration
Pilot projects
Experimentation
Early-career researchers

Impact
Mobility

Key Project funding by the AoF (2/2)

Eligibility

- no more than 14 years since PhD completion, peer-reviewed research funding from the Academy of Finland or a foreign/international funder

Funding

- max. €300,000 with funding period 1 Oct 2016–30 Sep 2018
- 100% funding, according to full cost model
- PI/staff salary, pilot projects, experimentation, analyses, testing, etc.
- not for economic activity
Key Project call 2016, review and decision-making

Call text
Call open 1–27 Apr 2016

598 applications

Cancelled or non-eligible applications (7)

Application check

591 applications for review, 138 reviewers, 13 review panels (rating + ranking)

Preparatory subcommittee
195 applications ranked

Final subcommittee

101 projects selected

To start: 1 Oct
Academy grants key project funding to 101 projects

- 30 million euros, i.e. around 300,000 euros per project
- 598 applications
- 13 review panels
- 138 Finnish and foreign experts reviewed the applications
- 101 funded projects (17%)

Funding recipients:
- Men 60%
- Women 40%

The funding matches the goals of the Government Programme:
- Digitalisation, experimentation and deregulation 16%
- Bioeconomy and clean solutions 14%
- Employment and competitiveness 8%
- Knowledge and education 6%
- Wellbeing and health 19%
- Other goals 37%

Focus on early-career researchers
Key Project applications and projects funded by the research councils’ themes

- Natural Sciences and Engineering: 253 applications, 46 funded
- Health: 126 applications, 19 funded
- Biosciences and Environment: 110 applications, 19 funded
- Culture and Society: 107 applications, 17 funded
Background funding of Key Project applicants and funding recipients

- 598 applicants
- 101 funding recipients

- Postdoctoral Researchers: 176 applicants, 28 recipients
- Academy Research Fellows: 194 applicants, 36 recipients
- Other AF funding: 169 applicants, 27 recipients
- Foreign: 56 applicants, 9 recipients
Gender balance among Key Project PIs

- **Applicants**: Average academic age of applicants and funding recipients: 9 years after PhD
- **Funding recipients**: Average age of applicants 41 years, average age of funding recipients 40 years
Funded Key Project topics vs objectives of the Government Programme

1. Employment and Competitiveness: 8% (8/101)
2. Knowledge and Education: 6% (6/101)
3. Wellbeing and Health: 19% (19/101)
4. Bioeconomy and Clean Solutions: 14% (14/101)
5. Digitalisation, Experimentation and Deregulation: 16% (16/101)
6. Others: 37% (38/101)
Key Project applicants and funding recipients, by scientific discipline (customized)

* Computational science and systems biology not included
Facts & Figures

Key Projects’ Mid-Term (12 months) Reports
Pls of the 101 Key Projects represent 14 nationality

In Key projects 2016, **20 %** of PIs are other than Finnish

Other than Finnish in 2016 calls:
- Projects **13 %**
- Res Fellows **25 %**
- Postdoctorals **27 %**
Key Project Titles
Key words in Key Projects
Research Areas of the Key Projects (1/2)
Out of 178 given research areas, 103 were chosen.
Mobility during 12 months
One of the aims of the Key Projects is to aid mobility

Average duration of mobility during the first 12 months:

- From Finland: 1.3 months / project
- To Finland: 0.7 months / project
- Inside Finland: <1 months / project

In total, 80 mobility periods was reported
Key project funding by the Academy of Finland

Collaboration
Research collaboration of Key Projects during the first 12 months

<table>
<thead>
<tr>
<th>Own research group</th>
<th>Other research group in the same university/research organisation</th>
<th>Other domestic research organisation</th>
<th>Domestic private employer</th>
<th>Domestic public employer</th>
<th>Domestic non-profit organisation</th>
<th>Foreign research organization / university</th>
<th>Foreign non-research organisation</th>
</tr>
</thead>
<tbody>
<tr>
<td>15</td>
<td>74</td>
<td>196</td>
<td>26</td>
<td>29</td>
<td>6</td>
<td>157</td>
<td>15</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Research collaborators in total</th>
<th>Out of which NEW research collaborators</th>
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<tbody>
<tr>
<td>424</td>
<td>219</td>
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</tbody>
</table>

Out of the 424 research collaborations reported,
- collaboration most often appear with national or foreign research organization
- 52 % are new research collaborations
- around 7 % exists with domestic private/public employee
Collaboration beyond Academia of Key Projects during the first 12 months

<table>
<thead>
<tr>
<th>Academic actors beyond the scientific community</th>
<th>Professional stakeholders or experts</th>
<th>Educational actors beyond the scientific community</th>
<th>Industry and commerce</th>
<th>Public administrative actors</th>
<th>Civil society actors</th>
<th>Ordinary citizens or the general public</th>
<th>Media and actors</th>
</tr>
</thead>
<tbody>
<tr>
<td>31</td>
<td>30</td>
<td>12</td>
<td>30</td>
<td>12</td>
<td>58</td>
<td>12</td>
<td>58</td>
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</tbody>
</table>

Out of the 243 collaborations beyond academia reported,
- 24 % exists with either civil society or media actors
- 12 % exists with industry and commerce
Implementation:
Publications & other activities
In 12 months, 260 publications were reported – 40 % with Open Access and 87 % with international peer review practices

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<tbody>
<tr>
<td>A1. Original scientific article</td>
<td>19</td>
<td>6</td>
<td>115</td>
<td>50</td>
<td>2</td>
<td>0</td>
<td>136</td>
<td>56</td>
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<tr>
<td>A2. Review</td>
<td>1</td>
<td>0</td>
<td>7</td>
<td>1</td>
<td>1</td>
<td>0</td>
<td>9</td>
<td>1</td>
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<tr>
<td>A3. Contribution to book/other compilations</td>
<td>0</td>
<td>0</td>
<td>8</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>8</td>
<td>1</td>
</tr>
<tr>
<td>A4. Article in conference publication</td>
<td>7</td>
<td>1</td>
<td>53</td>
<td>15</td>
<td>2</td>
<td>2</td>
<td>62</td>
<td>18</td>
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<tr>
<td>B1. Writing in scientific journal</td>
<td>0</td>
<td>0</td>
<td>3</td>
<td>2</td>
<td>0</td>
<td>0</td>
<td>3</td>
<td>2</td>
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<tr>
<td>B2. Contribution to book/other compilations</td>
<td>0</td>
<td>0</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>0</td>
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<td>0</td>
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<tr>
<td>B3. Article in conference proceedings</td>
<td>0</td>
<td>0</td>
<td>8</td>
<td>4</td>
<td>0</td>
<td>0</td>
<td>8</td>
<td>4</td>
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<tr>
<td>C2. Edited book, compilation, conference proceeding or special issue</td>
<td>1</td>
<td>0</td>
<td>1</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>D1. Article in professional journal</td>
<td>2</td>
<td>0</td>
<td>2</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>4</td>
<td>1</td>
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<tr>
<td>D2. Article in professional hand or guide book or in a professional</td>
<td>0</td>
<td>0</td>
<td>2</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>2</td>
<td>1</td>
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<tr>
<td>D3. Article in professional conference proceedings</td>
<td>1</td>
<td>0</td>
<td>3</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>4</td>
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<tr>
<td>D4. Published development or research report</td>
<td>0</td>
<td>0</td>
<td>1</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>1</td>
<td>1</td>
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<tr>
<td>D5. Text book or professional handbook or guidebook or guidebook or professional</td>
<td>0</td>
<td>0</td>
<td>1</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>1</td>
<td>1</td>
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<tr>
<td>E1. Popular article, newspaper article</td>
<td>3</td>
<td>3</td>
<td>8</td>
<td>4</td>
<td>0</td>
<td>0</td>
<td>11</td>
<td>7</td>
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<tr>
<td>E2. Popular monograph</td>
<td>0</td>
<td>0</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>1</td>
<td>0</td>
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<tr>
<td>F1. Published independent artistic work</td>
<td>0</td>
<td>0</td>
<td>2</td>
<td>2</td>
<td>0</td>
<td>0</td>
<td>2</td>
<td>2</td>
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<tr>
<td>G2. Master's thesis, diploma work, upper higher vocational education</td>
<td>1</td>
<td>1</td>
<td>2</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>3</td>
<td>2</td>
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<tr>
<td>G5. Doctoral Thesis, articles</td>
<td>1</td>
<td>0</td>
<td>1</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>2</td>
<td>1</td>
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<tr>
<td>Total</td>
<td>36</td>
<td>11</td>
<td>219</td>
<td>87</td>
<td>5</td>
<td>2</td>
<td>260</td>
<td>100</td>
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Other activities of the funded Key Projects

A lot of other activities were reported in form of:

- workshops,
- conferences,
- news,
- use of social media.
Implementation:
Use of Infrastructures
Implementation of Research – Use of Infrastructures

Infrastructures are essential both in research and in the utilization of research results

- Key projects have made use of a large variety of infrastructures
- Most intensive use of Infrastructures on Roadmaps (ESFRI or FIRI) was reported

11 Infrastructures on Road-maps (ESFRI or FIRI) or with Finland’s member-ships

5 Other infrastructures – outside Finland

18 Other infrastructures – in Finland
## Implementation of Research – Use of Infrastructures

<table>
<thead>
<tr>
<th>Infrastructures on Roadmaps (ESFRI or FIRI) or with Finland’s memberships</th>
<th>Other infrastructures – outside Finland</th>
<th>Other infrastructures – in Finland</th>
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<tbody>
<tr>
<td>• Biocenter Finland (14)*</td>
<td>• BIFoR FACE experiment, University of Birmingham, UK</td>
<td>• Elmer development (part of PRACE and FGCI)</td>
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<td>• CSC RI (14)</td>
<td>• Finnish Literature Society</td>
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<td>• OtaNano (9)</td>
<td>• Finnish National Museum, Helsinki</td>
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<td></td>
<td>• FGCI (4)</td>
<td>• Folklore archive of the University of Tampere</td>
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<td>• ELIXIR (3)</td>
<td>• National Board of Antiquities</td>
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<td>• EATRIS</td>
<td>• Regional Archive of Oulu</td>
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<td></td>
<td>• EMBL – membership</td>
<td>• Regional Museum of Lapland</td>
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<td>• Finna</td>
<td>• Saami Culture Archive of the University of Oulu</td>
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<td></td>
<td>• FINMARI</td>
<td>• Siida - The national museum of the Sámi</td>
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<td></td>
<td>• PRACE</td>
<td>• The Finnish Museum of Photography</td>
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<td>• Rami</td>
<td>• The National Archive of Finland – Saami Archive</td>
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*) number refers to use by several projects
Key project funding by the Academy of Finland

Impact beyond scientific community
Impacts of the 101 Key Projects at their Mid-Term

By definition impacts
- often appears through indirect chains of events and after a longer time
- manifest themselves beyond the scientific community

Examples of types of impact in Key Projects
- New tools, methods for laboratories, environments, etc
- Tests, concepts for application in diagnosis or planning locally or via internet
- Roadmaps, policy briefs, recommendation for societal use largely
- Bridge to larger international collaboration
Impact out there everywhere!
Impact of the 101 Key Projects reported by Mid-Term

- World views, culture and human understanding
  - 21% Not forseen / n.a.
  - 79% May/will have impact, specified

- Public services and societal functions
  - 27% Not forseen / n.a.
  - 73% May/will have impact, specified

- Economy and commerce
  - 15% Not forseen / n.a.
  - 85% May/will have impact, specified

- Health and wellbeing
  - 21% Not forseen / n.a.
  - 80% May/will have impact, specified

- The environment and natural resources
  - 48% Not forseen / n.a.
  - 52% May have impact, not specified
  - 25% May/will have impact, specified

Impact that manifests itself in other ways

Legend:
- Blue: Not forseen / n.a.
- Yellow: May have impact, not specified
- Purple: May/will have impact, specified
Key Projects at their Mid-Term – Examples of Impact 1

Knowledge and education

Web-based research service for deploying mathematics learning apps and game-based assessment in global scale

Kristian Kiili, Tampere University of Technology

• Based on Academy Research Fellow (2015-2020) and TULOS programme projects (2014-2017)
• Product: a Web-based service to conduct crowd-sourced mathematics game studies on a global scale
• So far:
  o An empirically validated math learning game (Semideus School) has been made publicly available for schools world wide
  o In addition to Finnish research collaboration, two studies have been conducted in German collaboration
• Co-operation outside Academia: Educational actors and companies (game services)
• Use of Facebook, Twitter and websites in marketing game competitions and distributing results to wider audience
Key Projects at their Mid-Term – Examples of Impact 2

Bioeconomy and clean solutions

Porcar-Castell Albert: Cost-effective methods for tracking large scale vegetation physiology: Participatory phase and pilot experiments

Albert Porcar-Castell, University of Helsinki

• Based on Academy Research Fellow project (2015-2020)
• Product: Two optical remote sensing methods to follow plant health status
• Original selection of the case studies for testing with 15 different stakeholders
• Infrastructures used: 1) LUKE research farm in Finland and 2) BIFoR FACE experiment, University of Birmingham, UK
• Immediate impact for the environment and natural resources, future impact in economy and commerce: Reducing costs of managing vegetation, drone-related industrial sector, hyperspectral (imaging) sensor industry, consulting companies
Key Projects at their Mid-Term – Examples of Impact 3

Digitalisation, experimentation and deregulation

Communication with metabolomics – development of novel computational tools for data-analysis and visualization

Kati Hanhineva, UEF, School of Medicine

- Based on Academy Research Fellow project (2014-2019)
- Product: A comprehensive solution of metabolomics analytics for service laboratories
- Collaboration: 1) RIKEN, Japan and 2) Aalto University, KEPACO research group, and for visualization design with 3) a Helsinki-based company Koponen &Hilden
- Piloting of the analytics has been started with two industrial collaborators within the field of food and nutrition sciences (Senson Oy and DuPont)
- To raise awareness, a metabolomics video has been published together with Science Stories” (http://www.sciencestories.net/)
- Semifinalist in the Helsinki Challenge competition 2017 – increase of visibility in the social media
- A parallel Tekes-funded TUTL-project has resulted in a spin-off company (https://afekta.com)
Key Projects at their Mid-Term – Examples of Impact 4

Digitalisation, experimentation and deregulation

Speech perception in noise in children with cochlear implants and hearing aids: The new Children’s test of word recognition in noise and realistic sound environments

Taina Välimaa, University of Oulu, Faculty of Humanities, Research Unit of Logopedics and Child Language Research Center

- Based on Academy Research Fellow project (2011–2016)
- Product: Children’s test of word recognition in noise (complies with EN ISO8253-3, 2012)
- Clinical medicine, medical technology, linguistics, phonetics, signal processing, machine human interactions, programming
- Co-operation outside Academia: university hospitals, Finnish Audiological Society
- Twitter: @valimaa_taina, www.ouluclrc.fi

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Key Projects at their Mid-Term – examples of Impact 5

Employment and competitiveness

Developing tools for combatting tax evasion

Kaisa Kotakorpi, University of Turku

• Based on Academy Project (2014-2018)
• Product: New practices to enhance the efficiency of the Finnish tax system
• Strong co-operation outside Academia: intensified meetings with Tax Administration, in collaboration with VATT
• New international research collaboration established:
  o workshop together with researchers from the University of Warwick to enhance research and data, with participants from the UK and Finnish tax authorities.
  o Collaboration and visits also with researchers in FI, DK, NO and USA
• Media actions with Yle
Key Projects at their Mid-Term – Examples of Impact 6

Wellbeing and health

The MUISTIKKO model for preventing dementia and disability

Miia Kivipelto, National Institute for Health and Welfare

• Based on: Academy Project FINGER (2014-2018)
• Product: Muistikko – A low-cost e-Health solution for dementia prevention-related decision-making developed together with VTT and Combinostics, testing with 250 FINGER participants
• Collaboration beyond academia: South Ostrobothnia Health care district, City of Seinäjoki, Memory Association
• With key stakeholders identification of facilitators and barriers of implementing dementia prevention activities and development of practical tools for implementation
• Collaboration with WHO to create international dementia prevention guidelines
Key Projects at their Mid-Term – Examples of Impact 7

**Other objectives**

- A concept for studying the toxicological effects of emission aerosols, nanomaterials and occupational dusts in online exposure system

**Pasi Jalava**, UEF, Dept. of Environmental and Biosciences

- Based on: Academy Research Fellow (2015-2020)
- Product: Thermophoretic cell exposure system for environmental toxicology – a new research & measurement concept with globally valid applications
- Larger national (UEF, TUT) and global research collaboration, visits/testing in GE, CH, CL and SE
- Co-operation beyond academia: alternative concept for animal testing (with FINCAM) and for atmospheric research (with EUROCHAMP)
- Patent pending, media: tietysti.fi interview
Key Projects at their Mid-Term – Examples of Impact 8

Other objectives

Roadmap and key figures of merit for a thermoelectric hot-electron bolometer based on superconductor/ferromagnet hybrid structures

Tero Heikkilä, JYU, Department of Physics and Nanoscience Center

- Based on: ERC Starting Grant 2012
- Product: A new concept for ultrasensitive measurements of electromagnetic radiation – a roadmap for design to various end users
- Collaboration: with SP, IT, FR in research; others European Space agency, ESA
- Patent pending
Monitoring, Reporting and Follow-up of the Key Projects

- Funding period through the Academy of Finland: **1.10.2016 – 30.9.2018**
- Communications: The Academy is bringing up cases from a rich variety of utilisation projects via e.g. interviews, news, blogs and the devoted web page
- **Joint Event** for the funded projects **17.10.2017**
- **Midterm reporting by 31.12.2017**
  - Reports via Academy’s electronic system
- **Final Event** for the funded projects planned to be **18.9.2018**
- **The final report dead line by 30.10.2018 (tbc)**
  - Reports will be analysed by the Academy and communicated via the Ministry of Education and Culture in a relevant form to the Government
- The Academy plans to send a **questionnaire 5 years after** the end of the funding period (2023).
  - Assessment of effects and various forms of impacts
  - To identify possible bottlenecks on paths to utilisation: for example, in dissemination or implementation → possibility for targeted assisting actions in the future