



TALLINNA
TEHNIKAÜLIKOOL

Teaduse väljakutsed üleilmselt ja Eestis.

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Teadusfoorum „teadusEST 2016“
Tartu, Dorpati konverentsikeskus
8. detsembril 2016.a.



Teadus?

Sotsiaalteadus

Alusteadus

Forschung

Science

R&D

Innovatsioon

Teadus

Teadus

Research & Innovation

Social science

Teadus

Formal science

Wissenschaft

Rakendusteadus

Teadus

Arendustegevus

Reserche

RTDI

Teadus

Experimental development

Humanities

Humanitaarteadus

Teadus

Teadus

Teadus



Frascati Manual 2015

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Definition of research and experimental development (R&D)

2.5 Research and experimental development (R&D) comprise creative and systematic work undertaken in order to increase the stock of knowledge – including knowledge of humankind, culture and society – and to devise new applications of available knowledge.

...

2.7 The activity must be: novel, creative, uncertain, systematic, transferable and/or reproducible.



Teaduse (R&D / R&I) eesmärgist

- Teadus(teadmine) on väärtus, ent teadus(tegevus) peaks looma ka hüve
- Nii väärtuste kui hüvede olemuse määratlevad inimesed elik nad on sotsiaalselt konstrueeritud
- Teadus muutub hüveks vaid väljaspool teadust
- Avalikult rahastatav teadus on kutsutud looma avalikku hüve
- „L'art pour l'art“ ja „La science pour la science“ suunduvad ühiselt eikusile



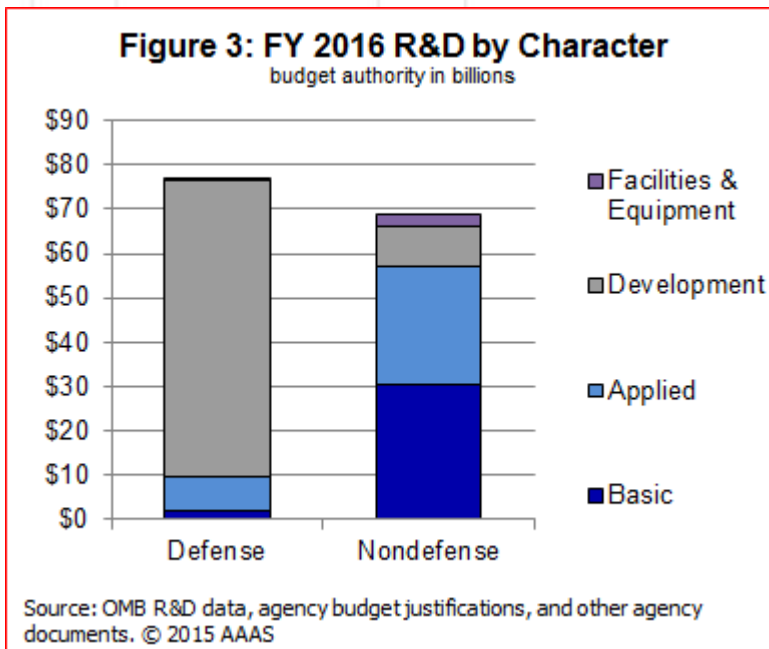
USA

- <https://www.aaas.org/fy16budget/federal-rd-fy-2016-budget-overview>
- The President has regularly drawn a connection between science and technology and the potential for middle-class jobs, including in [January's State of the Union address](#). Accordingly, the Administration's proposed investments, while generous in several areas of science, do pay particular attention to areas that may contribute in the nearer-term to job growth and advanced industry sectors, similar to prior budgets.



USA R&D föderaalne rahastus

- US GDP 2016 (est) 18,400bUSD
- R&D – 145bUSD ehk 0,8% GDP



Sh:

National Institutes of Health – 30bUSD

National Science

Foundation – 6,3bUSD



Euroopa Liit – Innovation Union

- https://ec.europa.eu/research/innovation-union/pdf/innovation-union-communication_en.pdf
- 1. In times of fiscal constraints, the EU and Member States need to continue to invest in education, R&D, innovation and ICTs. Such investments should where possible not only be protected from budget cuts, but should be stepped up. EN 3 EN
- 2. This should go hand in hand with reforms to get more value for money and tackle fragmentation. EU and national research & innovation systems need to be better linked up with each other and their performance improved.
- 3. Our education systems at all levels need to be modernised. Excellence must even more become the guiding principle. We need more world-class universities, raise skill levels and attract top talent from abroad.
- 4. Researchers and innovators must be able to work and cooperate across the EU as easily as within national borders. The European Research Area must be completed within four years – putting in place the frameworks for a truly free movement of knowledge.
- 5. Access to EU programmes must be simplified and their leverage effect on private sector investment enhanced, with the support of the European Investment Bank. The role of the European Research Council should be reinforced. The framework programme's contribution to nurturing fastgrowing SMEs must be boosted. The European Regional Development Fund should be fully exploited to develop research and innovation capacities across Europe, based on smart regional specialisation strategies.
- 6. We need to get more innovation out of our research. Cooperation between the worlds of science and the world of business must be enhanced, obstacles removed and incentives put in place.
- 7. Remaining barriers for entrepreneurs to bring "ideas to market" must be removed: better access to finance, particularly for SMEs, affordable Intellectual Property Rights, smarter and more ambitious regulation and targets, faster setting of interoperable standards and strategic use of our massive procurement budgets. As an immediate step, agreement should be reached on the EU patent before the end of the year.
- 8. European Innovation Partnerships should be launched to accelerate research, development and market deployment of innovations to tackle major societal challenges, pool expertise and resources and boost the competitiveness of EU industry, starting with the area of healthy ageing.
- 9. Our strengths in design and creativity must be better exploited. We must champion social innovation. We must develop a better understanding of public sector innovation, identify and give visibility to successful initiatives, and benchmark progress.
- 10. We need to work better with our international partners. That means opening access to our R&D programmes, while ensuring comparable conditions abroad. That also means adopting a common EU front where needed to protect our interests.



Framework Program for Research and Innovation – H2020

- Research and innovation help deliver jobs, prosperity, quality of life and global public goods. They generate the scientific and technological breakthroughs needed to tackle the urgent challenges society faces. Investment in this area also leads to businesses opportunities by creating innovative products and services.
- **HORIZON 2020: A BREAK FROM THE PAST**



H2020 – The Three pillars

- Total budget for 2014-2020 – 80bEUR
- Excellent science – 24bEUR
incl. ERC – 13bEUR
- Industrial leadership – 14bEUR
incl 6 sub-programs
- Societal challenges – 31bEUR
incl 7 sub-programs and 2 themes



EU DG RTD



ec.europa.eu/research/index.cfm?lg=en



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HORIZON 2020 Two years on

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 - Working in research - jobs, networking and working abroad

News & Information

HORIZON

The EU Research & Innovation magazine

ENERGY

02 December 2016

'Disruptive innovation' will set direction for Europe's new energy market - Commissioner Moedas

Transition to clean energy is happening, but not as fast as needed. →



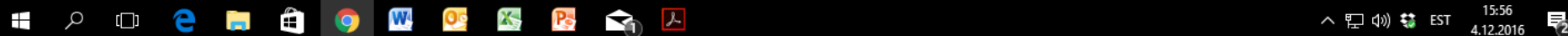
Carlos Moedas
Commissioner for
Research, Science and
Innovation



EU Research on YouTube

- #### Themes
- Bioeconomy
 - Energy

YOUR FEEDBACK





Soome

- Riiklik R&D rahastus 0,9% GDP
- Reformative Finland: Research and innovation policy review 2015–2020
[http://www.minedu.fi/export/sites/default/OPM/Tiede/tutkimus-
_ja_innovaationeuvosto/julkaisut/liitteet/
/Review2015_2020.pdf](http://www.minedu.fi/export/sites/default/OPM/Tiede/tutkimus-ja_innovaationeuvosto/julkaisut/liitteet/Review2015_2020.pdf)



Reformative Finland (2015)

- The position of Finland in the front line of countries building on knowledge and expertise must be strengthened with open-minded reforms. We must be capable of changing our operating methods and structures. We need a clear political message that encourages experimentation and risk-taking and actions of a new type, even radical ones. Giving up some functions will free up resources for creativity.

Prime minister Alexander Stubb



Reformative Finland (2015) II

The reform programme can be summed up in the following six points. The funding solutions presented in the document are also geared to these points.

Key development areas of R&D policy are:

- a radical reform of the higher education system
- promoting the exploitation and impact of R&I results
- strengthening new sources of growth, intellectual capital and entrepreneurship.

Other key targets for development are:

- improvement of the overall knowledge-base of the population and selective support for cutting-edge skills
- reform of the public sector and closer cross-administrative cooperation
- adequacy and targeting of R&D funding.



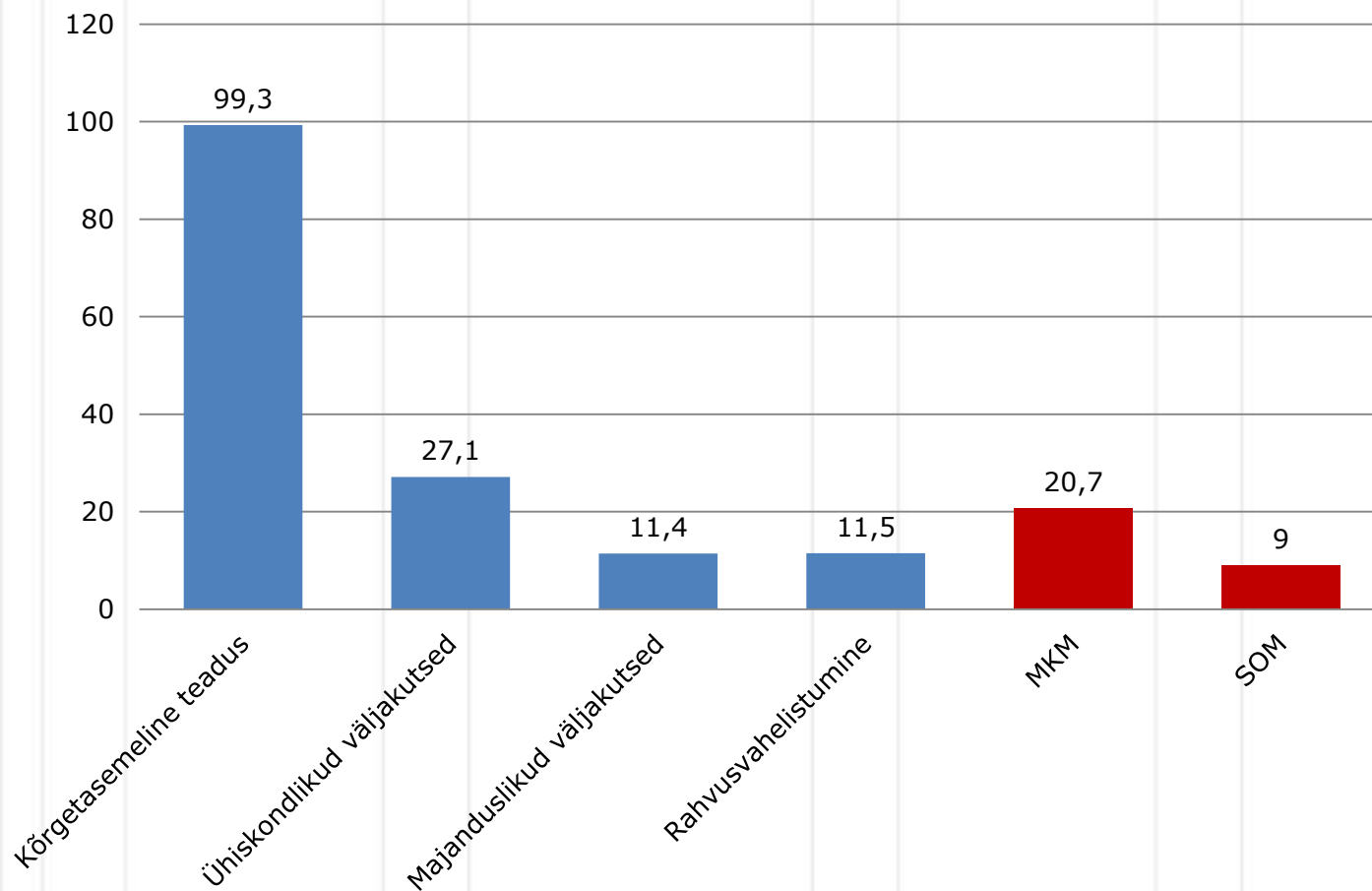
Teadmistepõhine Eesti

- Teadus- ja arendustegevuse ning innovatsiooni arendamise üldeesmärk on luua soodsad tingimused tootlikkuse ja elatustaseme kasvuks, heaks hariduseks ja kultuuriks, Eesti kestmiseks ja arenguks. Käesolev strateegia seab Eestile neli olulisemat alaeesmärki.
- 1) Eesti teadus on kõrgetasemeline ja mitmekesine.
- 2) Teadus- ja arendustegevus (TA) toimib Eesti ühiskonna ja majanduse huvides.
- 3) TA muudab majandusstruktuuri teadmistemahukamaks.
- 4) Eesti on rahvusvahelises TAI alases koostöös aktiivne ja nähtav.



Eesti R&D prioriteedid

Riiklik rahastamine 2016 (MEUR)





Baasfinantseerimine 10MEUR→40MEUR?

- Eesmärk: luua R&D võimekuse vundament?
- Millele?
- Käitumise määrab rahastusmudel
- Kui soovime rohkem Eestit, peab valemis olema rohkem Eestit
- Kui soovime rohkem tippteadust, pangem valemisse rohkem tipptulemusi



Hirmud ja ootused

- Teaduste Akadeemia:
Taome teadlased atradeks
- Teadus-Arendusnõukogu:
Meie loodud teadusvõimekus teenigu
meie inimesi ja majandust
- Vajame põhjendatud muutusi ja
mõistlikke kompromisse.
- Otsustada tuleb kiiresti kuid
kiirustamata
- Otsused peavad midagi muutma

