



EU RESEARCH POLICY

FOR PEACE,

PEOPLE

AND PLANET

A Civil Society perspective on the next
EU Research Framework Programme (FP9)

RESEARCH FOR IMPACT: ENSURING INVESTMENTS ADDRESS PRESSING SOCIAL & ENVIRONMENTAL CHALLENGES

The research that is prioritised and funded today will have a decisive impact on the future of our societies and our planet.

Our societies face immense environmental, social and economic challenges, as exemplified by the ambitious Sustainable Development Goals (SDGs) 2030 agenda.

It is certainly no time for “business as usual”, and radical change is needed for the European Union (EU) to address these challenges, such as climate change, food security, antimicrobial resistance, decent jobs for all, rising inequalities, and to mainstream the SDGs into the research agenda of the EU.

We have also entered an era of political instability. With Brexit and the rise of nationalism in Europe, citizens are increasingly questioning the “raison d’être” of the EU, the legitimacy of governments and mainstream politics, and the ability of governance structures to respond to society’s most pressing challenges.

Public research can enable the development of policies relevant to citizens and the planet.

As civil society organisations, we urge a reassertion of our core values, such as peace, democracy, participation, equality, social justice, accountability, solidarity and sustainability, at the heart of the European project.

The ever-increasing EU research budget¹ represents a good regional opportunity to try and address sustainability and peace.

SDGs: DEVELOPMENT WITHIN THE LIMITS OF OUR PLANET



ARCHITECTURE & FUNDING PRIORITIES OF FP9



- + **POST-2020 SUSTAINABILITY PROOFING:**
The three dimensions (social, economic, environmental) of the SDGs should become the basis for the next EU Research Framework Programme's architecture and ensure EU research policies work for people, peace and the planet, leaving no one behind. The pillars of Horizon 2020 ("Societal Challenges", "Excellent Science" and "Industrial Leadership") should complement each other and be used to achieve those goals.
- + 2/3 of the next EU research budget should directly address social and environmental challenges (up from the 38,53% dedicated to Societal Challenges Pillar in Horizon 2020).
- + While the Horizon 2020 programme has fallen behind its target to allocate 35% of its funding to climate action, FP9 should commit to respecting this target and show how the European Commission (EC) plans to implement it.
- + The next EU Research Framework Programme should exclusively fund civilian research in order to avoid diverting EU public money from people and the planet to the production of weapons and other military technologies, products and services.

BUILDING A SUSTAINABLE VISION FOR A FAIR RETURN ON PUBLIC INVESTMENTS

PEOPLE
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ENSURING A GREATER BALANCE BETWEEN MARKET RETURN AND PUBLIC RETURN

Sitting under heading 1a (Smart and Inclusive Growth: Competitiveness for Growth and Jobs) of the 2014-2020 EU budget, we are often reminded that Horizon 2020's primary objective is geared towards increasing the competitiveness of European industry. The belief that boosting industry's competitiveness will create jobs and 'trickle down' to the benefit of all people is misleading.

Private profitability is not a sufficient measure of public return – a position also defended by several renowned economists² and confirmed by the widening levels of inequalities within our societies.³ A sustainable planet needs alternatives to the high-growth, high-profit models of economic development.

It is reasonable for EU citizens and taxpayers to expect a fair public return on public EU research investments, that goes beyond the creation of jobs, competitiveness and growth.

There is a significant role for policymakers to design a system in which research maximises equitable social benefit from such public investment. Now, as the EU is reviewing its priorities and designing its next Research Framework Programme, the EU should invest in those areas which will benefit all sections of society. Research that will make Europe (and the world) an environmentally sustainable, peaceful and healthy place to live must now be prioritised.

PUBLIC RETURN ON PUBLIC INVESTMENT =
A public investment that benefits all sections of society, in a sustainable way, leaving no one behind.

OPEN SCIENCE: PUBLICLY-FUNDED KNOWLEDGE IS A PUBLIC GOOD

The sharing of data and knowledge from the scientific process accelerates and improves outcomes. The Commission has enthusiastically embraced open science and open innovation in its latest public statements.⁴ Although *open access to scientific publications* from publicly funded research under

Horizon is mandatory,⁵ only 61-68% of scientific publications produced as a result of Horizon 2020 funding, are open access, while 87% of Horizon 2020 projects have not yet produced publications.⁶ More needs to be done to ensure the Commission's open access policy is fully implemented.

HOW?

The Commission should prepare a strategy paper for large-scale transition to open access. The strategy should contain an economically viable plan for creating the best conditions for this transition with concrete, measurable goals for both EU financed research, also complying with the target of 100% open access set by the 2016 May Council Conclusions on Open Access.⁷

Regulation establishing Horizon 2020 also states that “*open access to research data* resulting from publicly funded research shall be promoted”. However, currently participants can opt-out of research data sharing at any stage - before or after the signature of the grant agreement. Reasons have to be provided, but the list of admissible grounds for opting out

is very broadly formulated: including for intellectual property rights (IP) concerns, privacy/data protection concerns, national security concerns, if it would run counter to the main objective of the project, or for other legitimate reasons. Given the added value of data sharing, exemptions to open data requirements should be extremely limited.

The Commission should take measures to further limit and specify the grounds for derogations of open-data requirements allowed in the rules for participation and dissemination in Horizon 2020, so they can be consistently applied in all programs.

HOW?

HEALTH: ENSURING CITIZENS' ACCESS TO AFFORDABLE MEDICINES

Astronomical prices of new drugs for cancer and hepatitis C in Europe have attracted considerable media and public attention, which has brought the debate on access to medicines into the political spotlight of the EU and its member states.⁸ Though the challenge of access to medicines has long been a concern for low- and middle-income countries, high prices now also threaten equitable access to treatment in the world's wealthiest countries, including Europe. Presently, public interest in Horizon 2020 investments is not sufficiently protected. Many leading experts and

governments – including some EU Member States and the European Parliament⁹ - have highlighted the need to improve the way public biomedical research and development (R&D) funding is managed in order to respond more efficiently to the urgent need for affordable new health technologies that meet priority public health needs. Knowledge and technologies generated by EU taxpayer-financed research should maximise public benefit and not focus on returns for large private actors.

“In those cases where public investment has played a major role in the development of certain innovative medicinal products, a fair share of the return on investments in such products should preferably be used for further innovative research in the public health interest for example through agreements made on benefit sharing during the research phase” “considering conditions such as equitable licensing to ensure a fair return on investment for publicly funded research that delivered a major contribution to the development of successful medicinal products”.

European Council Conclusions on strengthening the balance in the pharmaceutical systems in the EU, June 2016.

The introduction of new, expensive medicines comes at a huge cost to health systems and patients. EU member states are currently struggling to afford new medicines with excessive price tags, forcing them to adopt rationing policies and choose between the patients they can afford to cure,

and the financial sustainability of their healthcare systems. Leveraging EU public funding for medical R&D through binding provisions on access and affordability, is a crucial step to reconciling this conflict.

Binding provisions that require beneficiaries of EU public funding and Joint Technology Initiatives, such as the Innovative Medicines Initiative 2¹⁰, who are undertaking research aimed at developing life-saving, life-enhancing or life-prolonging health technologies, to commit to access, affordability, and availability principles. As such, a strategy/action plan on how the end product will be made affordable, accessible, and available shall be outlined jointly by all applicants in an Access Plan. IP management has the potential to enable or restrict access to technologies, derived from public funding.

For areas such as health technologies, non-exclusive, equitable licensing, as recommended in the 2016 Council Conclusions,¹¹ as well as shared ownership of results with the Commission, are examples of mechanisms that could be put in place in Access Plans to ensure access and affordability.

HOW?

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CLIMATE: NO RESEARCH FUNDING FOR BIG POLLUTERS

Our world is facing unprecedented environmental challenges, including human-induced climate change, air pollution, the loss of biodiversity, deforestation, desertification and ocean acidification, all of which are seriously affecting people's

livelihoods and political stability. Our planet will not be sustainable if our lifestyles continue to rely on fossil fuels and other dirty energy sources.

SHALE GAS AND OTHER UNCONVENTIONAL FORMS OF OIL AND GAS POSE A SERIOUS THREAT TO THE CLIMATE, THE ENVIRONMENT AND LOCAL COMMUNITIES.

Their extraction can lead to ground-water contamination,¹² serious health impacts,¹³ and significantly higher carbon emissions than other fossil fuels.¹⁴ In Horizon 2020, under the "Develop competitive and environmentally safe technologies for CO₂ capture, transport, storage and re-use" funding stream, there are four projects with the stated aim of mitigating the environmental risks around shale gas extraction, or "fracking".¹⁵

It is questionable whether projects whose aims include "Maximizing the EU shale gas potential" can be considered appropriate receivers of funding earmarked for research into environmental safety. These projects could perhaps more rightly be considered a fossil fuel subsidy, as they ultimately encourage the further deployment of fracking instead of promoting new renewable energy and energy efficiency technologies.

The world is on track to reach global warming in excess of 3°C, well above the objective set by the Paris Agreement to limit temperature rise to well below 2°C and aim for 1.5 °C. Successful transition towards a green economy is an opportunity to reshape the way we live and work. Operational research into the greening of the labour market

can make an important contribution to a successful energy transition and to the creation of millions of jobs. It is imperative that the EU invests more to hasten the transition from highly centralized, non-participatory and extractive resource-intensive economies to ones that are more democratic, localized and stable and respect planetary boundaries.

HOW?

FP9 should reflect the ambitions of the Paris Climate Agreement, moving away from investing in fossil fuels and other dirty energy sources through the research budget and instead massively invest in renewable energy R&D, efficiency improvements and operational research. This could help the EU to lead the global energy transition and facilitate creation of millions of jobs.

The above-mentioned challenges call for renewable technologies to be disseminated quickly and not to be hampered by IP rights. The EU should orient itself towards concrete policies of open knowledge and technology sharing

in order to favour successful resilience in the face of climate change and promote socially responsible and equitable licensing for renewable energy technologies.

NON-EXCLUSIVE LICENSING FOR THE GLOBAL FIGHT AGAINST CLIMATE CHANGE

Some of the proposals that could be adopted by the EU and internationally are:

- ✦ Publicly funded EU research should contain socially responsible licensing conditions to ensure non-exclusive licensing of relevant technologies used to fight climate change all over the world. In the same direction, climate and energy research produced in the public domain should not be privatised.
- ✦ The EU could create a patent pool of relevant green and climate technologies to complement and strengthen its global climate and development strategies.
- ✦ Specific innovation inducement prizes could be created within the EU's Horizon 2020 programme for appropriate and affordable green technologies. These technologies would have non-exclusive licensing conditions.

FOOD AND FARMING: FLAGSHIP INITIATIVE FOR THE TRANSITION TOWARDS SUSTAINABLE FOOD AND FARMING SYSTEMS

Agriculture has contributed much to crossing several of our planet's limits.¹⁶ For example, the growth in fertiliser use in modern agriculture has caused us to exceed sustainable limits for the rate of human interference with the global nitrogen cycle.

Agriculture has also contributed to exceeding the limits for climate change, the phosphorous cycle, global freshwater use and land use change. At the same time, farmers in Europe and globally are heavily affected by climate and environmental change.

Despite the intensity and impact of global agriculture, almost a billion people still suffer from inadequate diets and insecure food supplies. Moreover, the global transition towards diets high in processed foods, refined sugars, refined fats, oils and meats has contributed to 2.1 billion people becoming overweight or obese.¹⁷ In the EU, almost 52% of the population is overweight or obese¹⁸ and an estimated 33 million people are at risk of undernutrition in Europe.¹⁹ We hence face a "double burden" of malnutrition.

To make agriculture sustainable and achieve food and nutrition security, simply improving current food and farming systems is not sufficient.

A complete transition is needed. But many lock-in factors prevent the dominant systems to change. FP9 should feature a coherent and integrated flagship initiative to address these lock-ins.

The flagship initiative should fund research to re-shape and better integrate land, food and farming policies from the local to the global level, design new farming systems based on ecological approaches, set up transparent and fair supply chains and promote healthy and sustainable diets.

The flagship initiative should be based on organic and agroecological principles. The principles for organic food and farming – health, fairness, ecology and care – offer such a basis for sustainable food and farming systems.

These principles are closely connected to those of agroecology which "is based on applying ecological concepts and principles to optimize interactions between plants, animals, humans and the environment while taking into consideration the social aspects that need to be addressed for a sustainable and fair food system".²⁰ An increasing number of papers and reports point to benefits of food and farming systems based on organic and agroecological principles.²¹

PREVENTING THE MILITARISATION OF THE EU

Under Horizon 2020, the EU is rightly committed to funding research that supports the “freedom and security of Europe and its citizens”.

Horizon 2020 requires all EU-funded projects to have an “exclusive focus on civil applications”, but the implementation of the programme has supported the wholesale diversification of the defence sector into all areas of European security policy.

In addition, many of the projects approved under Horizon 2020 are of a dual-use²² nature, raising questions as to whether the funds are actually being used to support military applications, as was the case in the previous Research Framework Programme (FP7).²³

This overemphasis on ‘hard security’ has meant that research into areas such as fundamental rights, the dimensions of ‘human security’ (as distinct from national security), conflict prevention, security ethics, and innovative means of addressing the root causes of insecurity have been marginalised. Where these issues do appear in the EU’s security research programmes, they almost always appear as an afterthought in calls for proposals addressing hard security issues; only very rarely have these areas been considered worthy of funding in their own right.

HOW?

In the next Research Framework Programme the Commission should ensure that the security challenge institutes a meaningful balance between innovative security technologies on the one hand and research into fundamental rights, alternatives and root causes on the other.

We are concerned about the proposals that defence research might become a much more prominent EU research area post 2020. While the shape and focus of the European defence policy is still under discussion, very concrete proposals in the field of defence research cooperation and extra funding for the armament industry are taking shape under the rubric of promoting growth and jobs.

This represents a fundamental shift of the EU from a civilian peace-oriented project to a military-led one, with significant implications for the founding principles set out in the EU treaties. Moreover, the literature available mainly concludes that military spending, including research, has a rather

negative, or at best neutral impact on the economy,²⁴ and that similar levels of investment in other areas such as renewables energies create more jobs and growth²⁵ while addressing the major root causes of conflicts.

There can be no place for military research in the EU Research Programme, and those member states that do wish to cooperate in this area should do so via the European Defence Agency at their own cost. The EU should invest in jobs and research projects which contribute to the peaceful prevention and resolution of conflicts, an area which is largely underfunded so far, rather than subsidise research for arms production.

RESEARCH THAT BENEFITS ALL SECTIONS OF SOCIETY



- + In the next EU Research Framework Programme funding should be particularly increased and protected for social and environmental challenges where there is a lack of profitable commercial markets to drive R&D in fields of global health, food security, peaceful prevention of conflicts and climate change.
- + The EU should put in place binding provisions to ensure that publicly funded research benefits

wider society by requiring non-exclusive, equitable access licensing and encouraging open source access policies in the next Research Framework Programme.

- + The exclusive focus on civilian applications in the next Research Framework Programme must be maintained and the ‘back doors’ that provide de facto subsidies for military research must be closed.

3 RESPONSIBLE RESEARCH & INNOVATION: PEOPLE-CENTRED POLICIES

Public engagement with research is becoming an important element in public research funding. The participation of citizens and their organisations in the research process can be seen as a complement to industry participation which has been promoted for a longer time. The European Commission mentions “public engagement” as one of the five pillars of what they call Responsible Research and Innovation. National funding schemes for public research institutes also increasingly demand attention for societal impact or “valorization”. It can be claimed that tax payers should have some say in how their money is used for research, next to the general right of citizens to have a say on developments that will impact their lives and our planet. This holds especially true for research on what are called the Grand Societal Challenges of our time. These cannot be solved by experts in ivory towers or by pure market forces on their own but need a broader knowledge base.

Public Engagement in Energy Research, Jako Jellema, 2016²⁶

Public engagement, the active participation of civil society in decision-making processes, is both a root to impact and vital for democracy.

We are concerned about the bias toward industry and researchers in Horizon 2020 agenda setting. This creates conflicts of interest, whereby the main stakeholders setting the EU research agenda then benefit from the public funds on offer.

Currently, the only way that EU citizens can be consulted on the design and priority setting of EU research policies is via an online public consultation.

However, typically, only Brussels-based interest groups and organisations monitoring EU policy developments answer these consultations.

According to the results²⁷ of the public stakeholder consultation²⁸ on the Horizon 2020 interim evaluation, stakeholders were asked to choose up to five Sustainable Development Goals on which the future EU framework programme should focus.

The two top areas selected by the respondents are i) Combat climate change and its impacts and ii) Healthy living and well-being at all ages.

In addition, the most frequent words quoted when respondents were asked to state what was for them the most important area/topic to be addressed by the EU Research Framework Programme were climate change (190 times), health (188 times), society/ societal (139 times) and social (73 times).

HOW FP9 IS DEVELOPED

- + **Foresight study: long term scenario planning exercise (group of experts)**
- + **Report prepared by High Level Group (12 experts), chaired by Pascal Lamy, former head of WTO and former Trade Commissioner**
- + **Economics research showing economic impact of R&I**
- + **A public consultation**

The Commission should implement independent structures and processes and move towards more collaboration with citizens in order to act on behalf of the public interest.

Active citizenship can help solve the democratic deficit that has characterized European politics for many decades.

Democratic, participatory and accountable decision-making processes for research funding allocation, free from conflict of interests and industry dominance should be established.

WHAT DO PEOPLE REALLY CARE ABOUT?

We often hear that Europeans care about security and jobs the most. CIMULACT, a European project funded under Horizon 2020, asked 3458 citizens from 30 countries (including all EU member states)²⁹ which research programmes they would find most relevant for society:

- 1 At one with nature
- 2 Access to equal and holistic health services and resources for all citizens
- 3 Evidence-based personalized healthcare (initially Qualitative person-centered health)
- 4 Educational ecosystem as a driver of social innovation and local development
- 5 Consume smarter, increase well-being (initially Consume less, enjoy more)
- 6 Smart energy governance
- 7 Balanced work-life model
- 8 Good quality food for all
- 9 Empowered citizens
- 10 Debating alternative economic models (initially Alternative economic model)

Numerous innovative ways of meaningfully engaging citizens have been presented and tested. As such, we welcome Horizon 2020's "Science for Society" projects, and its "Responsible Research and Innovation" approach, which aim to better align both the process and outcomes of R&I, with

the values, needs and expectations of European society.³⁰ Those should undoubtedly be discussed and adopted by EU decision-makers and used in the further definition of Horizon 2020, in order to climb up the public participation ladder and build the knowledge base from the bottom up:

“Governments pay for science so it is our obligation to report back to the public”

Pearl Dykstra, member of the High Level Group of Scientific Advisors of the EC Scientific Advice Mechanism

1. **Informing:** To provide the public with balanced and objective information to assist them in understanding the problem, alternatives, opportunities and / or solutions;
2. **Consult:** To obtain public feedback on analysis, alternatives, and /or decisions;
3. **Involve:** To work directly with the public throughout the process to ensure that public issues and concerns are consistently understood and considered;
4. **Collaborate:** To partner with the public in each aspect of the decision including the development of alternatives and the identification of the preferred solution;
5. **Empowerment:** To place final decision-making in the hands of the public.

Source: *Public Engagement in Energy Research*, 2016

LIMITING CORPORATE INFLUENCE & ENGAGING CITIZENS INSTEAD



- + Increase the budget of "Science with and for society" to 1% of the total future Research Framework Programme (now at 0,6%).
- + Set up and operationalise mechanisms of active citizen involvement, collaboration and empowerment for the further definition of FP9 in order to reconnect with European citizens

and ensure future policy priorities meet their needs.

- + Ensure that all experts advising the EU research policy-makers are appointed in a transparent manner, free from conflicts of interests, with a balanced representation of views and stakeholders, including civil society.

4 ASSESSING & MONITORING SOCIAL IMPACT

Research that will make Europe and the world an environmentally sustainable, healthy and peaceful place to live must now be prioritised over research that delivers profit and economic return. In order to make the case for future investments, impact assessments mostly look at the economic impact of research programmes.

“Future allocations will be based on the bang for the buck we’ve gotten out of Horizon 2020”

*Robert Jan Smits,
Director General of
Directorate General for
Research & Innovation,
2016³²*

But if we are to achieve the SDGs, for instance in the field of global health, and end tuberculosis, AIDS, malaria epidemics and neglected diseases by 2030, we have to build social impact as a key parameter of research projects and build synergies with other programmes and funding from the European Commission in this regard.

However, no global health strategy or vision exists across the European Commission to achieve that goal. Since the 2010 Council Conclusions on the EU Role in Global Health, no implementation plan has been adopted.

Preliminary findings of an important European study³³ to be released in 2017 “From funding research to achieving universal health coverage: Impact of the European Union’s Research Framework Programmes” finds that Universal Health Coverage (another important SDG target) has simply not been built as an objective of EU Health Research and that it is therefore very difficult to quantify its impact.

Another recent independent evaluation report of FP7 confirmed that “the knowledge and evidence on impacts of FP7 and Horizon 2020 on society in general and on SDGs in particular is still very limited”.³⁴

“Economic growth needs to go hand in hand with societal progress in order to ensure harmonious development. Therefore a complete understanding of the full impacts of R&I needs to take into account both economic impacts as well as social impacts that support high levels of well-being. This paper focuses solely on assessing the economic impacts of R&I”

Economic rationale for public R&I funding and its impact, DG Research and Innovation, 2017.³¹

ENSURING ACCOUNTABILITY FOR EUROPEAN CITIZENS



- + The EU should use taxpayers’ money to invest in research that will directly benefit societies and impact positively on people’s well-being. Accordingly, the understanding of what constitutes “return” should be rethought and alternative metrics developed that link to achieving the SDGs targets.
- + Much more robust and systematic monitoring of social impact should be developed to ensure traceability of funding and accountability for citizens, in addition to standard better regulation tools identified by the

European Commission to ensure further mainstreaming of sustainable development in European policies.³⁵

- + In order to contribute to SDGs implementation, the “better regulation” agenda will need to be adapted, e.g. by transitioning from standard cost-benefit analysis mostly aimed at economic efficiency towards integrated analytical models based on the SDGs and by improving scientific input through the better regulation process.³⁶

- ¹ Horizon 2020 has a budget of €70,2 billion for 2014-2020 in constant prices. See http://eeas.europa.eu/archives/docs/enp/eu-programmes/pdf/14-horizon-2020-presentation_en.pdf
- ² Joseph Stiglitz, *Inequality and Economic Growth*, December 2015, <https://www8.gsb.columbia.edu/faculty/jstiglitz/sites/jstiglitz/files/Inequality%20and%20Economic%20Growth.pdf>
- ³ A report from the OECD's Centre for Opportunity and Equality (COPE) found that "Income inequality remains at an all-time high. In the 1980s, the average income of the richest 10% was seven times higher than that of the poorest 10%; today, it is around 9 ½ times higher." See OECD, "Understanding the socio-economic divide in Europe", 26 January 2017: <https://www.oecd.org/els/soc/cope-divide-europe-2017-background-report.pdf>
- ⁴ European Commission, *Open innovation, open science, open to the world - a vision for Europe*, 30 May 2016, <https://ec.europa.eu/digital-single-market/en/news/open-innovation-open-science-open-world-vision-europe>
- ⁵ European Commission, *H2020 Programme Guidelines to the Rules on Open Access to Scientific Publications and Open Access to Research Data in Horizon 2020*, http://ec.europa.eu/research/participants/data/ref/h2020/grants_manual/hi/oa_pilot/h2020-hi-oa-pilot-guide_en.pdf
- ⁶ Daniel Spichtinger, Senior Policy Officer, European Commission, Presentation on "Open Access in a European policy context" https://www.google.be/url?sa=t&rct=j&q=&esrc=s&source=web&cd=3&cad=rja&uact=8&ved=0ahUKWjU2aD42LjUAhWSP-FAKHWPYaqwQFggvMAI&url=http%3A%2F%2Fopencscience.org/fr%2FMARIE_FARGE%2F2017_CONFERENCE_ON_OPEN_ACCESS%2F2017_05_03_EUROPEAN_PARLIAMENT_BRUSSELS%2F2017_05_03_EP_Slides_Daniel_Spichtinger.pptx&usq=AFQjCNHQK5BIOoZ_58tgBA6KmatOSZtA
- ⁷ The Council of the European Union, *Council Conclusions on the Transition Towards an Open Science System*, 27 May 2016, <http://data.consilium.europa.eu/doc/document/ST-9526-2016-INIT/en/pdf>
- ⁸ Joint CSO publication, *Public Return on Public Spending: H2020 needs strong public interest: Conditions and incentives, position paper prepared for European Commission Public Consultation on Horizon 2020*, January 2017, <http://www.ghadvocates.eu/wp-content/uploads/2017/02/H2020-Joint-Submission-1.pdf>
- ⁹ European Parliament resolution of 2 March 2017 on EU options for improving access to medicines, 2 March 2017, <http://www.europarl.europa.eu/sides/getDoc.do?type=TA&language=EN&reference=P8-TA-2017-0061>
- ¹⁰ Public-Private Partnership between the European Commission and the European Federation of Pharmaceutical Industries and Associations (EFPIA) totals €5bn and aims at financing precompetitive pharmaceutical research and development. See <https://www.imi.europa.eu/>
- ¹¹ The Council of the European Union, *Council conclusions on strengthening the balance in the pharmaceutical systems in the EU and its Member States*, 17 June 2016, <http://www.consilium.europa.eu/en/press/press-releases/2016/06/17-epsco-conclusions-balance-pharmaceutical-system/>
- ¹² See Concerned Health Professionals of NY, *Compendium of scientific, medical, and media findings demonstrating risks and harms of fracking (unconventional gas and oil extraction)*, fourth edition, 17 November 2016, pp. 37- 69 and also pp. 71, 72, 123, 127, 178, 206.
- ¹³ *Compendium of scientific, medical, and media findings demonstrating risks and harms of fracking*, pp. 92-101.
- ¹⁴ According to the U.S. Department of Energy, tar sands crude oil has 20.2 g CO₂/MJ greater emissions than EU conventional crude. See Brandt, A. R., *Upstream greenhouse gas (GHG) emissions from Canadian oil sands as feedstock for European refineries*, Department of Energy Resources Engineering, Stanford University, 18 January 2011, p. 37, <https://circabc.europa.eu/d/d/workspace/SpacesStore/db806977-6418-44db>
- ¹⁵ European Commission, *H2020 Energy: Shale gas*, <https://ec.europa.eu/inea/en/horizon-2020/h2020-energy/projects-by-field/shale-gas>
- ¹⁶ Rockström J, Steffen W, Noone K et al. (2009). A safe operating space for humanity. *Nature* 461, 472-475.
- ¹⁷ Tilman, D. & Clark, M. 2014. Global diets link environmental sustainability and human health. *Nature*, 515: 518-522.
- ¹⁸ http://ec.europa.eu/eurostat/statistics-explained/index.php/Overweight_and_obesity_-_BMI_statistics
- ¹⁹ Ljungqvist O & de Man F (2009). Undernutrition – A major health problem in Europe. *Nutr Hosp* 24:368-370.
- ²⁰ See <http://www.fao.org/agroecology/overview/en/>
- ²¹ See for example: IPES-Food, 2016. From Uniformity to diversity. A paradigm shift from industrial agriculture to diversified agroecological systems. *International Panes of Experts on Sustainable Food Systems*. Pp. 93, Reganold, J. and M. Wachter. 2016. Organic agriculture in the twenty-first century. *Nature Plants*, 2, 1-8. Wezel, A., H. Brives, M. Casagrande, C. Clément, A. Dufour, and P. Vandembroucke. 2016. Agroecology territories: places for sustainable agricultural and food systems and biodiversity conservation, *Agroecology and Sustainable Food Systems*, 40(2), 132-144.
- ²² Dual-use are technologies normally used for civilian purposes but which may have military applications. In this case, it is about preventing the development of chemical weapons, weapons of mass destruction, bioweapons, etc.
- ²³ Corporate Europe Observatory conducted research into defence projects funded under FP7 and found examples of "pseudo-military research": "The TALOS (Transportable autonomous patrol for land border surveillance) project... is a Polish-led project to develop unmanned drones that can be used for border control. It aims to deliver military-style land vehicles (similar to small tanks), which could be adapted to carry weapons among other things... One of the TALOS partners is Israel Aerospace Industries (IAI), which has already developed a range of drones, some of which have been used for «assassination missions» over the West Bank and the Gaza Strip." See Corporate Europe Observatory, *EU research funding: for who's benefit?*, December 2011, https://corporateeurope.org/sites/default/files/publications/research_report_-_final.pdf
- ²⁴ J. Paul Dunne & Nan Tian, «Military Expenditure, Economic Growth and Heterogeneity», *Defence and Peace Economics*, Taylor & Francis Journals, vol. 26(1), pp. 15-31, February 2015.
- ²⁵ R. Pollin & H. Garret-Peltier, "The US Employment Effects of Military and Domestic Spending Priorities", 2011 update, Political Economic Research Institute, University of Massachusetts, 2011.
- ²⁶ J. Jellema and H. A. J. Mulder, *Public Engagement in Energy Research, Science & Society Group, Energy and Sustainability Research Institute Groningen, University of Groningen*, 24 February 2016, http://www.mdpi.com/1996-1073/9/3/125/h2020_evaluations/h2020_stakeholder_consultation_042017_web.pdf#view-fit&pagemode=none
- ²⁷ European Commission, *Results of Horizon Stakeholder Interim Evaluation of Horizon 2020*, 2017, https://ec.europa.eu/research/evaluations/pdf/archive/h2020_evaluations/h2020_stakeholder_consultation_042017_web.pdf#view-fit&pagemode=none
- ²⁸ European Commission, *Public stakeholder consultation – interim evaluation of Horizon 2020*, 2016, https://ec.europa.eu/research/consultations/interim_h2020_2016/consultation_en.htm
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