The Consumer Voice in Europe

WHEN INNOVATION MEANS PROGRESS

BEUC's view on innovation in the EU

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Why it matters to consumers

From new treatments for deadly diseases and longer-lasting products to cleaner vehicles, innovation can benefit consumers. Innovative products and services can improve consumers' health, wellbeing, and safety, and also help them live more sustainably.

But innovation can also go wrong. Adequate regulations must therefore be in place to minimise risks for consumers of innovative products and services. Moreover, consumer and societal benefits must be central for innovation to be well accepted and ultimately adopted.

Summary

Innovation holds many promises for consumer welfare, provided it is well designed and centred on the real needs and expectations of people and society.

There are many forms of innovations (technological but also social innovations, new business and consumption models, etc.) and multiple ways in which innovation can benefit consumers. But **innovation is not an end in itself, nor is it always beneficial.** It can even come with new risks for consumers' physical and mental health, safety, privacy and security, or for the environment or people's jobs.

There is no real innovation if it does not benefit consumers. For innovation to be consumer-driven, EU research and innovation policy must pay greater attention to consumer concerns, needs and expectations.

BEUC advocates a risk-based approach to the governance of innovation, taking account of the sector considered, the nature and consequences of the risks potentially stemming from innovation. The perception and level of acceptability of those risks by consumers and society at large must also be considered. Legitimate and effective regulation based on the precautionary principle has been, and will remain in the future, critical for ensuring consumer trust in innovation.

Moreover, the EU research and innovation agenda should:

- Give priority to supporting innovation which addresses demonstrated consumer and societal needs.
- Promote inclusive innovation that benefits all and not a select few. Innovation, however, must not be imposed on people, and consumers should always remain free to adopt – or not – innovative products and services.
- Involve civil society in a meaningful way. This requires addressing the lack of resources which often limit the participation of consumer and other civil society organisations in research and innovation agenda setting and programmes.
- Ensure that public money is used for goods that serve the larger public. The allocation of EU research funds should be conditional to public return, not only in terms of the relevance to societal needs and challenges, but also in terms of the accessibility (incl. affordability) of the innovation resulting from this research.

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1. Introduction

'Innovation' has moved to the forefront of EU policy-making in recent years, with a big share of EU policies now geared towards promoting innovation, seen as vital to European competitiveness in the global economy. Many companies and decision makers have high hopes in the capacity of innovation to bring solutions to current challenges such as climate crisis, air pollution and the depletion of natural resources.

In May 2018, the European Commission published its Communication on *"A Renewed European Agenda for Research and Innovation – Europe's chance to shape its future"* [1]. It sets out the Commission's vision for boosting Europe's innovation capability through an innovation-friendly regulatory and financing environment. With a strong focus on technology-driven innovation, it seeks to develop 'disruptive and breakthrough' innovations with a potential to create new markets.

There are many ways in which innovation benefits consumers. For instance, more energy-efficient products can help consumers save on their electricity bill and are good for the environment. Resealable packaging allows food to keep fresh for longer and, therefore, can cut household food waste. Digital platforms introduced new ways of online shopping, communications and entertainment. Artificial intelligence and automated decision-making promise to bring extra convenience for consumers (from digital assistants through self-driving cars to automated household robots). These technologies also promise progress in medical research and enhanced social inclusion (e.g. by allowing better access to services to the elderly or people with disabilities).

But these examples say little or nothing about the value of innovation *per se*. Not only are there multiple examples of unnecessary innovations, but innovation can also come with new risks for consumers' physical and mental health, safety, privacy and security, or for the environment or people's jobs. It can also put additional burdens on household budgets. This is often the case when innovation is not driven by consumer demand and need. An example of this are privacy abusive business models which only extract data from consumers while keeping them hooked to the platforms' services. This strategy maximises advertising revenues without delivering any valuable innovation to consumers.

This paper aims to present the consumer perspective on innovation. Too often, innovation is equated with *technological* innovation, whereas other forms of innovation (e.g. social innovation) get less attention. EU consumers' attitudes and perceptions should not be considered as an obstacle to innovation but rather as a guide for companies to develop products and services with greater consumer and social utility. Indeed, there is no real innovation if it does not benefit consumers. Moreover, following the controversy in 2018 around the industry-led 'Innovation Principle',[2] we reiterate the importance of the precautionary principle, which must be central to responsible and safe innovation as well as to regulation.

Finally, we put forward BEUC's 'checklist' for innovation that delivers for consumers and society. **For innovation to be trusted, accepted and adopted, it must be safe and widely accessible – in terms of price, availability and skills.** And if innovation is to better meet societal needs, civil society must be closely and meaningfully involved in shaping the research agenda, and public funding used as a tool to steer innovation towards the provision of public goods.

[1] https://ec.europa.eu/commission/sites/beta-political/files/communication-europe-chance-shape-future_en.pdf
[2] See BEUC's letter to the EU Parliament, "Precautionary principle under attack", December 2018.

2. Innovation: what are we talking about?

2.1. Innovation means more than technology

In its 2018 Communication on *A Renewed European Agenda for Research and Innovation*, the European Commission states that "the next wave of innovation, combining physical and digital, will be rooted in science, technology and engineering". The current research funding programme, Horizon 2020 equally places strong emphasis on promoting 'Key Enabling Technologies'[3] (incl. nanotechnologies, advanced materials, and advanced manufacturing and processing). It suggests that investing in these areas "will boost competitiveness, create jobs, and support growth".

This focus on technology-driven innovation is observed across sectors and policy areas. Looking at the food and farming sector for instance, technological innovation (incl. digitisation/precision farming and biotechnologies) is often touted as *the* solution to achieving more sustainable food systems. This is illustrated by the EU Communication *A Clean Planet for All*[4], where the Commission primarily looks for technological solutions to cut emissions from livestock production. The document suggests increased cattle productivity and treatment of manure to reduce non-CO2 emissions and produce biogas, whilst behaviour and consumption patterns are hardly addressed.

However, innovation means more to consumers than technology. It can be about new products and services (not necessarily high-tech), new ways of consuming (e.g. community-supported agriculture, home delivery of fresh fruit and vegetables, shared cars or bicycles). Innovation can also be about new company business models. An example is the French brand 'C'est qui le Patron[5]?', which engages consumers in the co-creation of a range of food products, giving them a say on specifications and price.

Sadly, EU policy-makers seem to give less attention to social innovations (incl. governance and citizen participation, ways to reduce waste, ethical finance)[6], than to technological innovation.

2.2. Market-orientation versus delivering public goods

Innovation is not an end in itself and must come with a purpose. The main aim of innovation, as currently reflected across EU policies, appears to be the boosting of Europe's competitiveness in the global economy. The value of innovation tends to be measured by the level of growth and the number of jobs it can create. Meanwhile, societal challenges (e.g. improved health, sustainable development, etc.) are given lower priority.

The Horizon Europe proposal[7] exemplifies this mindset, with the merging of the "Industrial Competitiveness" and "Global Challenges" pillars. BEUC and several other civil society organisations have expressed deep concern with this move, because it risks diverting funds and limiting prioritisation of the societal impact of projects. We have called on EU decision-makers[8], sadly with little success, to reinstate an independent pillar on 'Global Challenges' to ensure a needs-based research and innovation priority setting.

[3] https://ec.europa.eu/programmes/horizon2020/en/area/key-enabling-technologies
[4] https://ec.europa.eu/clima/sites/clima/files/docs/pages/com_2018_733_en.pdf
[5] https://www.quechoisir.org/actualite-brique-de-lait-c-est-qui-le-patron-decryptage-d-un-phenomene-n23123/
[6] https://youngfoundation.org/wp-content/uploads/2012/10/Study-on-Social-Innovation-for-the-Bureau-of-European-Policy-Advisors-March-2010.pdf
[7] https://eur-lex.europa.eu/resource.html?uri=cellar:b8518ec6-6a2f-11e8-9483-01aa75ed71a1.0001.03/DOC_1&format=PDF
[8] See BEUC position paper on the 2021-2027 MFF.

Indeed, it is crucial for EU- (i.e. publicly-) funded research and innovation to deliver to consumers. For instance, in the area of health, ensuring that new medicines are accessible and affordable is central to achieving meaningful societal impact. Consumers should not pay for their medicines twice: first when public money has funded drug research, and then when they purchase overpriced medicines directly or indirectly through their taxes[9].

Publicly funded medical research should be conducted according to the most pressing public health needs through an inclusive priority-setting process. Moreover, the EU should make public funding for medical research conditional on new drugs, health technologies, and studies being accessible and affordable for patients.

3. Consumers and innovation

3.1. The good, the hype, the ugly

Whether a specific innovation can be considered 'beneficial' for consumers and/or society is not straightforward to assess. It may depend on the population group considered, on values, rights, legal duties and even on the current state of knowledge. By way of example, the hydrogenation of edible oils was considered a technological breakthrough at the beginning of the 20th century. It provided the food industry with a cheap and stable source of solid fat, and consumers with products with a longer shelf life. Yet it turned out that this new process created harmful 'trans fats', for which there is now a scientific consensus that they should be eliminated from the food supply.[10]

The use of microplastics (microbeads) in cosmetics provides another example of such 'regrettable innovation'. Prior to the invention of synthetic microbeads, manufacturers used *naturally* abrasive materials including cocoa beans, ground almonds and apricot pits, sea salt, or oatmeal. Unlike their natural alternatives, which biodegrade when released in the environment, microbeads are persistent and virtually impossible to remove from the environment, especially water. Given mounting concern over the adverse impact of microplastics on our environment, several EU Member States have in recent years introduced national bans on the intentional use of microbeads in cosmetics. In January 2018, the EU chemicals agency followed suit and started to examine the need for an EU-wide restriction under the REACH regulation.[11] Microbeads thus illustrates an innovation whose benefits for society and consumers is highly questionable, especially compared with the natural substances they replaced.

Innovations that genuinely improve the health of consumers by preventing (vaccines) or curing (innovative treatments) diseases are widely recognised as very beneficial. In the food area, heat treatment techniques (pasteurisation, sterilisation) which stop bacterial and enzyme activity have considerably improved the preservation of food. These techniques have been improved over time to better retain the flavour, texture and nutritional quality of products, and new methods are being explored (e.g. high-pressure processing) which may bring new advantages in terms of preserving both the microbiological and organoleptic quality of food.

Innovations with more questionable added value would include for instance **'antibacterial' clothes** with silver nanoparticles. Whilst they pretend to kill bacteria and inhibit unpleasant odours, there has been no assessment of these claims or of the risks these nanoparticles may pose to public health and the environment. **Single-serve coffee**

[9] Test-Achats. *Médicaments. Vous les payez deux fois* in Test Santé 149, February 2019.
[10] https://www.beuc.eu/press-media/news-events/commission-publishes-it-plans-limit-unhealthy-trans-fats
[11] https://echa.europa.eu/en/hot-topics/microplastics

pods are another interesting case. They are very popular with consumers – despite their price –, yet questions have arisen around their environmental impact and recycling.

In the pharmaceutical sector, persistent concern has likewise been expressed around the practice of 'evergreening'[12]. In short, drug manufacturers add new patents to prolong a drug's exclusivity, though the additions are not fundamentally new, obvious, and useful (e.g. making a pill into a spray).[13] Such practices bring little benefits in terms of patient treatment but could allow pharmaceutical companies to hinder market access to competitors (such as cheaper generics).

Also, bundled goods and services are increasingly a consumer's reality, e.g. in energy, financial, telecoms markets. While bundled offers can provide simplicity and savings to consumers, they may not provide the best deal reflecting the specific needs of individual consumers. They can also lead to complex contracts, higher bills and lock-in situations.

Some innovations, especially in the digital area, can also exclude or discriminate against certain groups of consumers. For instance, our member organisation DECO reports that, as a digital vaccine leaflet was being implemented in Portugal, it was decided that the paper version would no longer exist. This caused accessibility problems for the elderly and people deprived from internet usage or with low digital literacy.[14] Another example is online banking. While convenient for most people (immediate access, 24/7 availability), it also means that consumers who continue to go to bank branches (elderly, illiterate, digitally unsavvy) now pay a higher price for services (e.g. money transfer at the bank counter).

But even more problematic are innovations which introduce new risks in consumers' lives – without them even realising. 'My Friend Cayla' doll is a telling example: in a test they commissioned, the Norwegian Consumer Council discovered that this connected toy had severe security flaws, exposing children's personal data and putting them in danger as strangers were able to contact them through the toy's Bluetooth function.[15] Most recently, EU authorities announced to recall a smartwatch for children from the market over data privacy risks[16]. The benefits of digital services like social media can also be questioned from the viewpoint of consumers' privacy and exacerbation of addiction.

3.2. Consumer attitudes towards innovation

Acceptability of innovation by the public is often raised as an obstacle which needs to be overcome by "educating" consumers. This is particularly true in the food area, where high-ranking European Commission officials have repeatedly referred to a "risk-averse" consumer "when it comes to food, tending to favour tradition over innovation". [17]

The Eurobarometer 341 on Europeans and Biotechnology in 2010[18] did however not depict a risk-averse consumer, but rather a rational individual. Consumers reportedly base their acceptance of various biotechnologies on questions such as: "Are [these technologies]

[12] See European Commission. Pharmaceutical Sector Inquiry. Final Report. July 2009.
[13] According to a recent US review, 74 percent of new patents during the decade 2005–2015 went to drugs that already existed. It found that 80 percent of the nearly 100 best-selling drugs extended their exclusivity protections at least once, and 50 percent extended their patents more than once – with the effect of prolonging the time before generics could reach the market as drug prices continued to rise. Available at: https://papers.ssrn.com/sol3/papers.cfm?abstract_id=3061567
[14] See BEUC, Digital health – principles and recommendations, October 2018. Available at: www.beuc.eu/publications/beuc-x-2018-090_digital_health_-_principles_and_recommendations.pdf
[15] https://www.beuc.eu/blog/toyfail-when-toys-fail-children/
[16] https://ec.europa.eu/consumers/consumers_safety/safety_products/rapex/alerts/?event=viewProduct&reference=A12/0157/19&lng=en
[17] See for instance this speech by the Health & Food Safety Commissioner, Vytenis Andriukaitis.
[18] http://ec.europa.eu/commfrontoffice/publicopinion/archives/ebs/ebs_341_winds_en.pdf

safe? Are they useful? And are there 'technolite' alternatives with more acceptable ethical-moral implications?"

The survey also found that "there is no rejection of the impetus towards innovation" but that "Europeans are in favour of appropriate regulation to balance the market and wish to be involved in decisions about new technologies when social values are at stake".

Moreover, this Eurobarometer survey shed light on a certain consumer hesitancy towards technology. When asked about climate change and how it could be tackled, respondents in all countries except two (Latvia and Malta) replied they would "favour changes in ways of living over technological solutions, even if this [meant] reduced economic growth".

This **overall preference for low-tech innovation** is also what came out of a public dialogue research on food systems challenges which was jointly carried out by consumer group Which? and the UK Government Office for Science in 2015.[19] Participating consumers were informed of the challenges facing the food system (incl. rising obesity and health issues, impact of food production on climate change, the environment and water shortages, etc.). They were also presented the range of potential solutions to tackle these challenges.

The research showed "there was **clear support for those [solutions] that were low-tech, natural or focused on behaviour change, although novel technologies or production processes were not rejected out of hand.** For hi-tech solutions and processes there was a desire for an independent organisation to ensure that these were safe, worthwhile and that there were no low-tech alternatives which would be publicly acceptable and achieve similar outcomes."

In the field of digital technologies, consumer attitude to innovation is also driven by a sentiment of resignation. Consumers are constantly subject to digital firms' commercial surveillance and manipulation for the sake of extracting data and maximising advertising revenues.[20] Consumers accept or tolerate such practices due to strong network and lock-in effects of the services, as well as due to the lack of alternatives to dominant business models.[21]

Lastly, consumer acceptance of innovation is also dependent on the context and purpose. For instance, the 2008 Eurobarometer poll on Animal Cloning[22] found that close to two-third of EU citizens may accept animal cloning to preserve endangered species or to improve the robustness of animals against diseases. However, Europeans were significantly less willing to accept animal cloning for food production purposes, with 58% saying that such cloning should never be justified.

3.3. Who gets the benefits… and who takes the risks?

Consumers' acceptance of innovation is, among other aspects, influenced by the perceived benefits for themselves. Yet, whilst the benefits for businesses are often obvious (e.g. making profits or creating marketing buzz), there is in general more uncertainty on the consumer benefits – and risks – of innovation. This applies for instance to food applications of nanotechnology, for which the Eurobarometer survey 341 found that Europeans are uncertain of the benefits for themselves, whereas they see some potential risks.

The EU legislation on food additives[23] sets an interesting precedent in this regard. Article 4(2) provides that a new food additive may only be authorised if it has "advantages and

[19] Food System Challenges - Public Dialogue on food system challenges and possible solutions. Which? and the Government Office for Science (2015).
[20] Norwegian Consumer Council, "Deceived by Design", report
[21] Which?, 'Control, Alt or Delete? The Future of Consumer Data, policy report, June 2018
[22] http://ec.europa.eu/commfrontoffice/publicopinion/flash/fl_238_en.pdf
[23] Regulation (EC) 1333/2008.

benefits for the consumer" (in addition to its use being safe, technologically needed and not misleading). Whilst EU policy-makers have failed to consistently apply this principle throughout the implementation of the food additives legislation, it nevertheless constitutes a key criterion, which should apply to innovation in general.

Companies and legislators should give greater consideration to whether an innovative product, technology or service brings real benefits to consumers (economic, environmental and social benefits). The notion of 'benefits' should not only cover direct benefits to consumers (e.g. saving money with longer-lasting products) but also indirect ones (e.g. increased environmental sustainability of durable goods, enhancing privacy protection, competition).

Sadly, innovation does not always reflect the actual needs of consumer, nor does it necessarily target the right population groups. For instance, some manufacturers fortify their foods with vitamins for the sole purpose of making an appealing health claim, regardless of whether the EU population is getting enough of these vitamins or not.

Similarly, innovations in the health sector are not always delivering the therapies that patients need. Recent medical innovation has made remarkable advances for a limited number of conditions, whilst yielding unimpressive results in most other disease areas. This is particularly true with the trend of 'follow-on' patents ('evergreening') that we described in section 1.3. By contrast, the threat of antibiotic resistance means there is a need for new antibiotics, but these medicines are generally not as profitable as others and innovation has stagnated.[24]

Many new medicines that enter the market do not offer consumers any additional clinical benefit compared to existing treatments. In France, only 2% of new medicines licensed between 2000 and 2013 offered a real advance for their approved indications.[25] The situation is similar in Germany and the Netherlands. Yet, new treatments expose patients to increased risks because they are new and have been tested only on a small group of people. Consumers need assurance on medicines' safety and efficacy. For this, it is crucial that benefit-risk assessments are based on robust scientific evidence and safety is continuously monitored. When discussing innovation, it is important to bear in mind that, to consumers, this means medicines and therapies that work and are safe.

4. Innovation and precaution

4.1. The 'Innovation Principle' controversy

In December 2018, the inclusion of the 'Innovation Principle' in Horizon Europe, the future EU research funding programme, made the headlines.[26] **Originally promoted by a coalition of industries,[27] this principle aims to ensure "that whenever policy and legislation are developed, the impact on innovation is fully assessed"**. It has since then found its way into the EU Better Regulation programme[28] and, most recently, in the Communication on *A Renewed European Agenda for Research and Innovation* and Horizon Europe.

[24] "Between 1940 and 1962, more than 20 new classes of antibiotics were marketed. Since then, only two new classes have reached the market." From *Novel classes of antibiotics or more of the same?*, 2011, Coates, Halls, Hu.
[25] See BEUC position paper on Access to Medicines.
[26] See for instance articles by Politico and Le Monde.
[27] European Risk Forum letter to European Commission President Juncker (November 2014).
[28] https://ec.europa.eu/info/sites/info/files/file_import/better-regulation-toolbox-21_en_0.pdf

BEUC wrote[29] to Members of the European Parliament to voice its concern with this 'principle'. **While innovation holds many promises for consumer welfare – provided it is well designed and centred on their real needs and expectations – it is neither an end in itself nor is it always beneficial.** A significant part of EU policies and regulations is already geared – and rightly so – towards promoting innovation. Similarly, it already is normal practice for the European Commission, when conducting an impact assessment of future legislation, to consider a broad range of potential impacts, including on innovation – but also on consumers, the environment, etc. As such, there is no need for a new 'Innovation Principle' to be created.

As we see it, **the 'Innovation Principle' essentially aims to counterbalance the Treaty-based precautionary principle** to "encourage a balanced view of risks and benefits", as industry puts it.[30] The problem is, as previously stated, that the benefits and risks of innovation are rarely shared evenly between businesses and consumers. Moreover, no robust methodology exists for a thorough quantification and assessment of the risks and benefits associated with laxer, 'innovation-friendly' legislation. Risks for public health or the environment stemming from of a lack of precautionary policy action can become apparent only years after industry has reaped the economic benefits of the related innovation.

Eventually, **the level of risk that society is willing to accept – possibly in exchange of demonstrated benefits – is a democratic decision** that needs to be openly and transparently debated. The application of a systematic 'Innovation Principle' at the very early stage of the legislative process, when all policy options and their consequences have not been publicly spelled out, might take this choice away from the public.

4.2. Understanding the precautionary principle

The precautionary principle was enshrined in the Maastricht Treaty in 1992. It is now included in Article 191 of the Treaty on the Functioning of the European Union among the principles underpinning EU environmental policy (alongside with preventing and rectifying pollution at source, and the 'polluter pays' principle).[31]

The European Commission's Communication on the precautionary principle (2000)[32] provides guidance on how to apply it, and puts forward the following definition: "Whether or not to invoke the precautionary principle is a decision exercised where scientific information is insufficient, inconclusive, or uncertain and where there are indications that the possible effects on the environment, or human, animal or plant health may be potentially dangerous and inconsistent with the chosen level of protection".

There are diverging views on the method (e.g. cost-benefit analysis, pros and cons of action and inaction) which should be used to determine whether to apply the precautionary principle or not. Indeed, costs are generally difficult to quantity if there is uncertainty about the hazards and non-economic considerations (e.g. health) tend to be side-lined in cost-benefit approaches. Disagreement can also lie with the definition of what the 'acceptable level of risk' is for society – and hence the corresponding precautionary measure (e.g. a ban).

The precautionary principle is a safety net for European consumers. It crucially allows authorities to take temporary, precautionary measures in the absence of a final proof of harm to consumers or the environment. As such it is different from the *prevention*

[29] See our letter.
[30] https://www.euractiv.com/section/innovation-industry/opinion/no-risk-no-innovation-europe-needs-an-innovation-principle/
[31] European Parliamentary Research Service (2015). The precautionary principle Definitions, applications and governance.
[32] Communication from the Commission on the precautionary principle, European Commission (2000).

principle[33], which aims to prevent damages to the environment, of which the effects are known and undisputed, from occurring at all.

Contrary to widespread misconceptions, science is central to the proper use of the precautionary principle. Faced with indications of possible harmful effects on the environment or health, albeit with insufficient, inconclusive, or uncertain evidence, policymakers can decide to invoke (or not) the precautionary principle to reflect the level of protection desired by society.[34] The precautionary principle is meant to guide the political and regulatory choices which are made to manage the risks identified by scientific research.

Another widespread misconception about the precautionary principle is that it stifles innovation. On the contrary, **the precautionary principle pushes industry to research and innovate in safer or greener alternatives**, which benefits both consumers and the economy[35].

In fact, the precautionary principle is underused. It took years, sometimes decades, for policymakers to address some health hazards, despite early warnings. One notorious example is lead that was added to petrol for decades, ignoring experts' warning about its likely toxicity as early as 1925. The European Environment Agency's report '*Late lessons from early warnings: science, precaution, innovation*'[36] includes numerous instances of cases where early warnings existed but no actions were taken.[37]

Another example is that under the old EU chemicals legislation, many decisions were made with reference to the precautionary principle. Under the current EU chemicals law, REACH, the precautionary approach has however never been, despite REACH being legally underpinned by the precautionary principle.[38]

Legitimate and effective regulation based on the precautionary principle has been, and will remain in the future, critical for ensuring consumer trust in innovation. It promotes worthwhile innovation that is valuable to society at large and ensures that proper weight is given to environmental and health risks and concerns.

5. BEUC's checklist for innovation that delivers for consumers

Depending on the sector considered, the nature and consequences of the risks potentially stemming from innovation vary widely, as do the perception and level of acceptability of those risks by consumers and society at large. For that reason, there cannot be a 'one-size-fits-all' approach to the governance of innovation. At the same time, some key principles should guide regulators when designing innovation-related policies.

5.1. Take a risk-based approach to the governance of innovation

In today's fast-changing world, regulators are increasingly struggling to keep pace with innovation. Yet, consumers expect a level of supervision that strikes the right balance

[33] See European Environment Agency, Glossary, "prevention principle".
[34] See EC Communication on the precautionary principle (2001).
[35] A 2013 report by CIEL showed that "*spikes in the patenting of phthalate-alternatives clearly correlate with the timing of new laws to protect people and wildlife from phthalates. As the stringency of measures increased, so too did the number of inventions disclosed in patent filings by the chemical industry. Similarly, the phase-out of ozone depleting substances also illustrates how progressively stricter rules at the global level can drive a sustained effort to invent safer alternatives.*"
[36] https://www.eea.europa.eu/publications/late-lessons-2
[37] Despite claims to the contrary, the Precautionary Principle has never been used under the REACH regulation to regulate a chemical according to the Commission recent review.
[38] See *Commission General Report on the operation of REACH and review of certain elements,* Commission staff working document, March 2018.

between enabling innovation and ensuring it poses no unacceptable risks to health, safety, security, the environment, or people's values (e.g. democracy, right to privacy). This might require **intervening at different stages of the innovation 'life-cycle' depending on the sector considered.**

For instance, in the food or medicines areas, pre-market interventions (incl. risk assessment and authorisation) are necessary to ensure that innovative products placed on the market will not cause harm.

Where pre-market interventions are needed, **a smart regulatory design can help ensure that regulatory compliance costs do not end up discouraging innovation.** For instance, prior to 2006, the EU chemicals legislation would discriminate against new chemicals because data requirements only applied to chemicals marketed after 1979. In that situation, industry had little incentive to develop new, safer alternatives to old – but potentially toxic – substances. The REACH regulation explicitly sought to overcome this problem by introducing data requirements for all chemicals according to their production volume. This means that less data is required for new chemicals with a smaller market share, thus easing their way into the market.[39]

By contrast, **other governance forms might be more adequate where possible undesirable effects of innovation cannot be foreseen until the product reaches the market.** In certain sectors, the concept of 'regulatory sandboxes' is being explored as a tool to help foster innovation. **Sandboxes allow innovators to trial new products, services and business models in a real-world environment, without some of the usual rules applying.** Examples of sectors where regulatory sandboxes have been established include the Fintech area[40] of the energy market.[41]

In order not to compromise consumer rights and protections, **criteria however need to be developed to guide a case-by-case assessment by authorities of whether a new product or service qualifies to enter a sandbox.** Such criteria should include the innovative nature of a product/service, a demonstrated impossibility or high unlikelihood to be developed without a sandbox, and clear benefits of the product/service for the consumers. Sandboxes should be limited in time and monitored throughout their duration. They should in no way serve as a shortcut to avoid regulation[42], nor should they be a means to change regulation on a permanent basis.

When addressing potential risks from innovation, it is important to consider not only 'traditional' risks to health and the environment, but also 'new' risks stemming from digitalisation (e.g. risks to democracy and pluralism resulting from electoral interference through social media, risks to privacy, cybersecurity risks). **A robust governance framework of innovation should seek to capture the broader impacts of innovation – on people, the environment, the economy, etc.** Such frameworks should also spot at an early stage potential concerns (from a scientific or societal perspective) and areas of uncertainty and be able to respond quickly and effectively to new information becoming available.

[39] Despite the initial, 'apocalyptic' claims from some parts of the chemical industry, the direct costs of REACH have so far been minor at EUR 2.3 – 2.6 bn, slightly higher than the EUR 1.7 bn anticipated by the Commission priori to 2006. These costs stand in direct contrast to the estimated benefits for human health and the environment of EUR 100 billion over a 25-30 years period. Source: European Commission, General Report on the operation of REACH and review of certain elements, March 2018.
[40] According to a report published by the European Supervisory Authorities (ESAs) in January 2019, five competent authorities had established operational regulatory sandboxes (DK, LT, NL, PL and UK) at the time the report was drafted, and several others (LT, NO, AT, ES and HU) had mentioned preparations under way.
[41] See the UK regulator for gas and electricity market, Ofgem's note on sandboxes.
[42] See also BEUC response to the European Commission consultation on Fintech.

Finally, **where properly designed, regulation can even foster innovation, rather than hinder it.** A good illustration is provided by the EU payments legislation. Both Payment Services Directive contributed to stimulating competition by opening the EU market to non-banking payment service providers, while at the same time setting high standards of consumer protection. Similarly**, to boost innovation, it is important to reduce barriers to entry** by ensuring access to essential infrastructure (e.g. in the field of energy and telecoms) and goods and information necessary for downstream markets to develop. **Standardisation is another example of how regulation can stimulate innovation**. The Ecodesign requirements, for instance, ensure that new fridges, televisions or light bulbs are less energy-intensive and therefore better for consumers' wallet and the environment.

5.2. Put consumer and societal needs first

The EU research and innovation policy should promote innovation that is valuable to consumers and society at large. For that to happen, priority must be given to supporting innovation which addresses demonstrated societal needs. This can be done by creating the right incentives through tax policies and publicly funded R&D programmes.

Even when certain applications of new technologies appear to address some societal needs, public authorities should support and promote these in a responsible way. This means investing in research, not just on the expected benefits, but also on the potential risks of these technologies for the environment, consumer health or safety. This is key to ensuring the proper regulation of these technologies and can also contribute to fostering public acceptance thereof.

Putting consumers and societal needs first also means balancing the claimed efficiencies that technology generates for companies against what is truly beneficial to consumers from an individual and societal viewpoint, using as a benchmark the rights and values embedded in the EU's treaties and the Charter of Fundamental Rights.

5.3. Make sure innovation leaves no one behind

To be widely accepted within society, innovation must benefit all and not be perceived as reserved for a select few. This concerns a broad range of EU policies touching upon education (to help people develop the right skills to use technological innovations), infrastructure (e.g. access to broadband connection), health (e.g. affordable access to innovative medicines), etc.

Innovation, however, must not be imposed on people and consumers must always remain free to adopt – or not – innovative products and services. As an example, the fact that payments are increasingly digitalised should not mean the end of cash, of which the continued existence is a matter of consumer freedom.[43]

5.4. Engage civil society in a meaningful way

The EU should turn words into deeds and consistently implement the principles of 'Responsible Research & Innovation' (RRI)[44] across its policies and programmes. Such an approach would ensure civil society is involved meaningfully and systematically in co-designing and co-creating the research and innovation agendas and contents. This is crucial if we are to align the research and innovation outcomes with societal needs, expectations and values.

[43] BEUC blog Why digital can't replace cash, June 2016.
[44] European Commission, *Responsible Research and Innovation* - Europe's ability to respond to societal challenges, 2014.

This requires addressing the lack of resources which often limit civil society participation in research and innovation programmes. Funding opportunities must be provided to involve consumer and other civil society organisations in research programmes, as of their inception. Moreover, to encourage applications by consumer organisations, calls for proposals should be simplified. Indeed, the preparation of a fully-fledged proposal is very complex and represents a disproportionate investment for consumer organisations – with their limited resources – considering the competition in such procedures.

This also requires shifting away from the 'education' paradigm, where engagement is only seen as a tool to overcome consumer/public opposition. Instead, regulators should accept the outcomes of consumer and civil society engagement and duly follow up on them.[45]

5.5. Spend *public* money on *public* goods

EU funding shall be used as a tool to steer research and innovation towards the provision of benefits for consumers. **The allocation of EU research funds should be conditional to public return**. focusing both on the relevance to consumer and societal needs and challenges, and on the accessibility (incl. affordability) of the innovation resulting from this research.

For accountability's sake, **there should also be greater transparency on the EU funding of research**. This would help prevent situations whereby Europeans pay twice for innovation, first as taxpayers through research and innovation incentives, and then as consumers when they purchase the resulting product or technology. Thus, initiatives such as delinking incentives to invest in R&D from the prices of products and services should be further assessed as a model for cost-oriented innovation.[46]

5.6. Involve consumer organisations

Consumer organisations have a unique role to play to inform about consumer attitudes towards innovation – about its benefits but also its risks and red lines that need to be respected. It is crucial for consumers to have access, via consumer organisations, to credible information that also takes into account sectoral specificities: the cost-benefit assessment of information can vary depending on whether for example your health/safety is at stake or not.

Consumer organisations – thanks to their systematic contacts with consumers and their expectations – also are a key player in the assessment of the risks and benefits of innovation from the consumer perspective. They should be systematically included as stakeholders in decision-making processes related to the promotion and assessment of innovation in consumer-relevant sectors.

[45] European Parliament Research Service, What if we could design better technologies through dialogue?, 2019.
[46] An interesting example is the Global Antibiotic Research & Development Partnership (GARDP), which tests new incentives for the development of antimicrobial treatments that the pharmaceutical industry would otherwise likely not develop for lack of profitability.

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