

Science, technology and innovation in a new geopolitical landscape: a wake-up call for Europe

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The current wave of socio-economic and technological disruptions and geopolitical tensions is shaking the foundations of the European Union. For an institution that just 10 years ago received the Nobel Peace prize for having demonstrated how openness in trade and economic integration amongst European nations would not just bring economic growth and welfare but also peace, this represents a fundamental threat. Openness in the trade of goods but also of services, of capital and labour, and ultimately of knowledge has been the basis of intra-European integration. It became an intrinsic part of European values of democracy and transparency towards the outside world, exemplified, among other things, with the EU championing the notion of “open science”.

Today, this European openness vision is being challenged. A need for a more “balanced” approach has emerged recognizing in the first instance Europe’s positioning in a geopolitical competition over core technologies and in the second instance, suggesting that Europe should now adjust its openness according to dictums of “open strategic autonomy” and “technological sovereignty”. Recently, the ESIR expert group, which we are part of, published the focus paper “Research, innovation, and technology policy in times of geopolitical competition”. In there we call for a balanced approach of de-risking and responsible risk taking, which takes different rationales for openness into account. We argue that the changing geopolitical context requires new priorities for European Science, Technology and Innovation (STI) policy, to ensure that Europe continues to reap the benefits of technology and openness in achieving competitive sustainability.

Access to green technologies are a convincing case for such a balanced approach. There are strong rationales which support openness: firstly, addressing global challenges, such as climate change, requires global cooperation per se. This involves sharing not only scientific insights as with the IPCC but also exchanging technology and policy options, enhancing global STI capacities and providing access to technologies worldwide. With environmental problems becoming increasingly a driver of conflict, this also increases Europe’s security. Secondly, there are economic reasons for openness: The debate about reaching emission targets increasingly emphasizes the high technology costs. Seizing opportunities of international division of labour brings the costs of emission reduction down. Furthermore, Europe has a comparative advantage with regard to new green technologies. According to data from Fraunhofer ISI, Europe holds about 30 % of green transnational patents, way ahead of US, Japan and China with about 15 % each. But seizing these economic opportunities requires both ambitious domestic demand policies to scale technologies and openness to export them not just within Europe but also globally. Thirdly, green technologies are highly linked to the build-up of infrastructure, and can become a building block in new geopolitical coalitions and new partnerships with countries of the Global South.

Green technologies are, however, also strongly intertwined with security, which underlines the case for responsible openness. Firstly, in such an important technology class, Europe should not be reliant on a few countries which might exploit such a dependency politically. Europe’s relative strength in

green technologies conceals potentially problematic dependencies along the value chain of the construction of such technologies. Green technologies incorporate e.g. key digital components, and high dependencies on particular critical raw materials. Secondly, the energy, mobility and water sector are not only key to sustainability transformation, but have also become much more important from a security perspective, raising the issue of how to make the infrastructure in these sectors less vulnerable towards intentional attacks and problematic dependencies. We have to look into new ways to design and build infrastructure which is secure and enables greening at the same time.

We see a strategic positioning of Europe paying particular attention to those issues as a necessary first step to increase European security, as well as a foundation for sustainable development and prosperity. But this will not be enough. Europe needs to fundamentally rethink and reshape the relationships between security, sustainability and STI at the level of the European single market. There will be no security without sustainability, and achieving sustainability will require acknowledging and working with security needs. The latter means that sustainability efforts can and should tap into the growing national and European resources and momentum in the defence sector to ensure scale-up and impact of green solutions. Both security and sustainability depend critically on – as well as being crucial drivers of – innovation. This triangle has been the missing item in Europe’s R&I policy. Instead of continuing with siloed national policies, Europe needs today an integrated push to link Sustainability, Security and STI at European level. Such an integrated push might draw inspiration from some of the features of the U.S. DARPA (Defense Advanced Research Projects Agency), which has allowed the US to drive disruptive innovation and technology development that both meets national defence needs and at the same time promotes widespread technology uptake and economic development through commercial applications. Such an integrated approach would address some of the current shortcomings of European STI policy, which has not put uptake and diffusion of new technologies and innovation into sufficient focus and continues to be hampered by fragmented policy approaches between institutions responsible for science and research on the one hand, and demand side policy measures on the other hand. In a time of increasing geopolitical tensions where Europe’s freedom and democracy at stake, innovation, security and sustainability need to cross-fertilize and reinforce each other. Europe should now assume a new position in linking defence, innovation and sustainability – *triple use* – for the benefit of its own national security and competitive sustainability.

The governance mechanism of such a program will have to be adapted to the European political needs. So far, security issues are primarily national policy concerns. For the U.S. and China it is much easier to integrate sustainability and security issues in STI policies than it is for the EU, which consists primarily of small countries besides a couple of large and medium sized ones. So the European STI policy agenda in the new geopolitical landscape is suddenly wide open... In his Nobel speech, the then European Union President Herman Van Rompuy, called the interdependence created by the single market, Europe’s “secret weapon” in creating peace in a continent ravaged by two world wars. Today, the new geopolitical landscape requires a broadening of this European interdependence creating de facto intra-European solidarity to both security and sustainability.