Get the Environment into those Algorithms!

The BMU's key points for a digital policy agenda for the environment

At the re:publica 2019 conference, the Federal Ministry for the Environment, Nature Conservation and Nuclear Safety (BMU) presented its key points for a digital policy agenda for the environment and provided an initial set of ideas on what digitalisation should look like if it is to be green, environmentally sound and climate-friendly. We want to discuss our ideas with digital technology users and developers. And we want people to consider our ideas, add to them and criticise them as they see fit. By the end of the year, we plan to turn the ideas into a digital policy agenda for the environment.

The megatrends of our time are digitalisation, globalisation and climate change. These trends are changing the lives of all people. They are confronting us with the question of how we really want to live in the future, how we want to use new technologies and, finally, with the question of how we can best safeguard the peace we enjoy on economic, social and ecological fronts. And do so not only in Germany, but also in Europe and throughout the world. Digitalisation is raising "old" questions in new ways. Questions about property ownership and distribution, and about the concentration of economic and political power. Issues of participation and access are taking on new importance as well. The most recent example is being provided by the global "Fridays for Future" movement. Digital connectedness has boosted the establishment, visibility and strength of that movement, which is trumpeting the message "fight climate change now and save our planet!"

If we do not want to find ourselves being driven by events, we have to be willing to take an active role. Populists claim "my country first" is the way to a better future. We want to get to that future by reaching out and working together.

Digitalisation's impacts on the environment and natural systems have long been underestimated. If those impacts continue unabated, they will exacerbate our planet's ecological and social crises, by sweeping us past the planetary boundaries all the faster. This is because they entail ever-increasing consumption of energy, resources and goods, along with more and more transports.

This is why we need a major turnaround in digitalisation. A turnaround that can bring prosperity into harmony with justice and environmental protection. Digitalisation, if sustainably oriented, can drive all kinds of opportunities. It can interconnect renewable energy sources and support the energy transition. It can link bicycles, buses, cars and trains within effective transport networks, both inside and outside of cities. It can help us fertilise our crops precisely and, thereby, also protect biodiversity. It can provide transparency in supply chains and for

consumers. It can help bring about a true circular economy. And it can help us better assess the sustainability of financial investments.

To make use of digital-based opportunities for our environment, we need good examples, incentives and rules – ideally, throughout all Europe. While the US relies on unregulated monopolies, and China moves toward total state surveillance, we need to follow our own European way. A way toward a social, ecological, economically strong and democratic Europe that both promotes digital innovations and protects its citizens and their data privacy.

We want to combine things digital with things environmental, and give every algorithm a good dose of environmental action. In developing a digital agenda for environmental protection, climate action and nature conservation, we are working on a compass for digitalisation in Germany and Europe that will show the way forward at every fork in the road. We want to create a smart regulatory framework that will define objectives for digitalisation and point it in the right direction. A framework that will enable digitalisation to be a driver for sustainability and serve the Sustainable Development Goals of the UN's 2030 Agenda. We are deeply convinced that our strategy can both benefit the environment and, by promoting innovation, provide new impetus for industry.

During the German EU Council Presidency in the second half of 2020, we plan to refine our agenda in cooperation with our European neighbours.

Smart combinations with digitalisation: 10 theses

1. **We want to make full use of digitalisation's potential to support climate action, our challenge of the century.**
   Digitalisation can enhance planning of electricity and transport networks. It can make buildings, machines and vehicles "smart", improve people's access to information and enable real-time, requirements-based control of systems. **Industry 4.0** can greatly improve efficiency in our use of natural resources. However, to ensure that greater efficiency truly does lead to better climate action, we need to be on the lookout for rebound effects.

   – In the framework of the programme of measures for climate action 2030, we plan to establish a **Digital Innovation Hub for the Climate** that will promote the development and spread of digital innovations for climate action and link stakeholders in the economic, science and policy-making sectors. As part of this effort, we plan to provide office space, research grants and networking support for start-ups with innovative solutions for climate action.

   – As we update the **ProgRess III** German Resource Efficiency Programme, we will look closely at digitalisation's potential to make production more resource-efficient and climate-friendly. The ProgRess programme defines objectives, guiding principles and options for protection of natural resources.

   – We also plan to structure the **BMU's funding programmes** with greater emphasis on digital technologies for climate action.

– In addition, we plan to conduct a climate impact assessment of the measures in the German government's "Implementation strategy for shaping the digital revolution" ("Umsetzungsstrategie zur Gestaltung des digitalen Wandels").

– In the context of our **international cooperation**, we will support those most affected by climate change and biodiversity loss by promoting digital strategies for monitoring and adaptation.

– We want to ensure that the opportunities inherent in **digitalisation** receive greater attention **at upcoming climate change conferences (COPs)**. At UN Sustainable Development Summits, we will highlight digitalisation's potential to support the Sustainable Development Goals of the UN's 2030 Agenda.

2. **We want digitalisation that safeguards protection for the environment and natural systems. Digital monitoring can enhance enforcement of compliance with environmental law, and it can improve our ability to track environmental changes – for example, to stop species and habitat loss.**

– To protect biodiversity, we are developing a **biodiversity monitoring centre**. Its tasks will include preparing decisions and providing information about impacts of interventions in natural systems and about the effectiveness of protective measures. Citizens will be able to inform themselves, with just a few mouse clicks, about the condition of natural systems in their neighbourhood.

– The agriculture sector will also profit from the new centre as it depends on biological diversity – just as we all do. Digital tools can help farmers apply fertiliser and plant protection products more precisely and sparingly, thereby providing targeted protection for species. To ensure that the **digitalisation of the agriculture sector, including organic farming, takes place in a sustainable way**, we are supporting efforts to establish a "master platform" for agriculture that would integrate environmental data and safeguard farmers' independence from global corporations.

– We are also working to strengthen **enforcement authorities'** digital resources, to improve monitoring and combat environmental crime more effectively.

– With the European Union's **Copernicus earth observation programme** we can monitor the earth's environment, oceans, climate and natural systems more accurately, enabling us, for example, to take better action against plastic waste in the oceans.

3. **We want digitalisation in which artificial intelligence is oriented to benefits for people and the environment. Only then can it truly be considered a forward-looking, key technology. We want to make artificial intelligence a driving force for protection and conservation of our environment, natural systems, climate and resources.**

   With artificial intelligence (AI), for instance, it is possible to reduce energy inputs and emissions in steel and cement production, manage traffic to make it flow more smoothly and thus produce lower emissions, and improve efforts to combat poaching and illegal fishing.

   – We are funding **50 lighthouse projects** to harness the power of AI for the benefit of the environment.

   – We need to "get the environment into our algorithms," and create ecological "guard rails" for AI. To this end, we plan to develop **criteria and a seal of quality for environmentally compatible AI**. We are building a **competence network "AI and sustainability"** that will help good examples become visible throughout our society and economy.

   – To make AI environmentally compatible, we need new alliances and partners, and thus we want to have companies, civil society and municipalities support and join our efforts. In addition, we are launching a **programme** that, also **in cooperation with unions and works councils**, will help disseminate environmentally oriented AI applications throughout business enterprises.

4. **We want digitalisation in which all people are entitled to environmental data. Just as all people are entitled to a healthy environment. Our position on this is that environmental information must be easily accessible, freely available, valid and transparent. Such information belongs to everyone.**

   – In this vein, we are supporting efforts to introduce a "**data-for-everyone act.**" In addition to helping curtail excessive economic and political power, such an act would promote transparency in decisions, strengthen innovation and facilitate creative solutions that benefit the environment, natural systems and our climate.

   – Germany needs an **environmental data cloud**. We plan to establish such a cloud, which would serve as a basis for open data access and as a source for innovation, in the coming years. To that end, we need to ensure that all of our environmental authorities are ready for the coming digital transformation.

   – **Collaborative platforms** can provide opportunities to harness the power of big data for everyone's benefit. In real-world laboratories, we are testing options for such platforms, and involving potential users in the process of programming the relevant software.

- The BMU's first and very successful sustainability hackathon showed how environmental information can lead to **useful, competitive ideas for start-ups.** The BMU plans to make its hackathon an annual event. We invite businesses, the Länder, municipalities and environmental associations to join us on this project.

5. **We want digitalisation that puts clear limits on energy and resource consumption and that upholds standards for health protection. This is why digitalisation has to be made ecologically sound.**

- The German government is setting a good example: Since 2009, in the framework of the **green IT energy saving programme**, the **energy consumption of the government's IT systems** has decreased by nearly 60 percent, in spite of significant performance increases. By 2024, we plan to further reduce those systems' energy consumption by an additional two percent each year.

- With our Blue Angel environmental label, we are already showing ways to enhance the **energy and resource efficiency of ICT systems and data centres**, and thereby setting standards for businesses, government agencies and private users.

- Moreover, we want to give the Blue Angel another "set of digital wings". We are developing criteria for a Blue Angel label for **resource-efficient** software.

- In the expansion of our mobile communications networks and the introduction of 5G systems, compliance with established limits and **protection of human health** have top priority. We want to engage with mobile network operators to ensure that electromagnetic fields are kept to a minimum. Where necessary, we plan to adapt existing law in keeping with digital progress. Such efforts will help foster on-site acceptance for installation of digitalisation-related infrastructure, such as new base stations.

6. **We want digitalisation that creates closed product cycles and holds businesses more accountable for ensuring that transformation of our economy is sustainable. We want to apply digitalisation to the tasks of making production and supply chains transparent and improving worldwide compliance with environmental and social standards. We want to prevent illegal exports of electronic waste, especially exports to Africa.**

- We want to make **manufacturers responsible for the entire life cycles of their products** – including production, operation, service and repair, and recycling and disposal.

- We plan to support efforts to make **digital devices environmentally sound** and to expand the scope of the existing EU Ecodesign Directive.

- **Electronic waste and discarded and unusable electrical appliances** should not simply be going abroad, to places such as the Agbogbloshie dumping ground in Accra, Ghana. We plan to review the effectiveness of amendments to European and national law governing electronic and electrical devices and – if necessary – to work to tighten such legislation.

- **Blockchain technology** can be applied to trace the pathways on which raw materials, including rare earths, move from extraction to recycling. We want to use this and other relevant new technologies to hold companies accountable for the social and ecological impacts of their products. As part of such efforts, we also want to provide positive incentives for **responsible entrepreneurship**.

- Via the German government's blockchain strategy, we are working to bring about a more critical perspective and handling of energy-intensive **mining protocols** so that investments can be diverted to environmentally sound alternatives.

7. **We want digitalisation that promotes sustainable consumption and sustainable mobility and that raises awareness about the environmental impacts of everyday actions.**

   Consumers should be able to inform themselves "with just one click" about the sustainability of goods, services, food products and clothing. Digitalisation can also help us share goods more efficiently and develop mobility and logistics services that are more environmentally friendly.

- As part of our efforts to promote energy-efficient ICT systems, resource-efficient production, data sufficiency, product reparability and sustainable consumption, **we are reviewing the need for a new European directive on IT-systems design**.

- In this same context, we are calling for a **"right to repair."** To that end, we need European standards for the life expectancy of digital devices, standards that consumers can depend on.

- We plan to provide impetus for the **development of digital applications** that, by providing transparent, complete and trustworthy information, **will facilitate sustainability-oriented consumer decisions**.

- In addition, we are promoting use of environmentally friendly transports, smart alternative transport options and multi-use packaging, along with the pertinent infrastructure for such improvements, in order to counter the negative environmental impacts of **growing online commerce, including all the packaging and delivery transports** such commerce entails.

- In connection with the pending **amendment to the Carriage of Passengers Act** (Personenbeförderungsgesetz), we are working to strengthen new mobility options such as ride-sharing and carpooling, which are useful complements to local public transportation.

– We are looking at ways that digitalisation in the transport sector, especially the use of **self-driving cars**, could have positive environmental effects. Our findings will enter directly into the relevant legal framework.

8. **We want digitalisation driven by sustainability-oriented research. The digital transformation's potential impacts on the environment, our natural systems and on sustainability overall are just beginning to be examined. Current scenarios for the digital world of tomorrow are based on conventional experience, assumptions and pathways. As a result, we are not really coming up with anything new – we are simply projecting the old into the future.**

– We urgently need new guidelines for environmental protection and climate action. As we seek to harmonise such guidelines conceptually with the requirements imposed by the digital transformation, we have to do away with preconceived notions – and even be open to new social and ecological models for society. To progress on this front, we need independent research.

– In cooperation with the Federal Ministry of Education and Research (BMBF), we are working to introduce a joint **research agenda on sustainable living in a digitalised world**.

– Too little effort is being invested in bringing digitalisation and sustainability together conceptually. To meet our research requirements in this area, this topic has to be approached interdisciplinarily and transdisciplinarily, and become a mainstream subject, in all relevant areas of science. This is why we are supporting the call to establish a **research institute for digitalisation and sustainability**.

– In addition, the BMU plans to promote **real-world laboratories and open experimental spaces** related to the topics of sustainable mobility and agriculture for testing innovative solutions in cooperation with local stakeholders. Testing in them would be independently based, open as to outcome and oriented to identifying requirements for pertinent action.

9. **We want digitalisation based on a strong civil society, on broad-based participation and on good digital environmental education.**

– Civil society stakeholders make important contributions to the development of innovative ways to promote environmental protection, nature conservation and social cohesion. We support the call for the establishment of an **innovation agency** that would assist such stakeholders in expanding their digital know-how and in developing digitally based and socially oriented solutions to sustainability problems.

– In cooperation with the German Federal Environmental Foundation (DBU), we plan to establish a discussion series aimed at having the issue of **digitalisation's ramifications for environmental policy figure prominently in our civil society discourse**.

- In the interest of education for sustainable development, we plan to further strengthen **digital empowerment** in education oriented to environmental protection and climate action.

- Via **citizen science projects and online participation processes**, we want to get the public more involved in shaping the digital-ecological transformation.

- In addition, we plan to launch a **programme for making coursework on green IT an established part of the computer-science curriculum**, and we will work to raise awareness about **green coding**.

10. **We want digitalisation in which today's new forms of work and collaboration are reflected in organisational cultures. We are also working to build and expand our own competencies in the area of digitalisation – and to implement a "BMU modernisation agenda."**

- As part of our steps toward a more modern and more digital work organisation, we are introducing **virtual spaces for teamwork**. We also plan to create a **"DIGI HUB,"** a real-world space for work, discussion and debate and for new forms of collaboration.

- We want to promote a culture that creates space for innovative thinking and approaches, builds on digital technologies and processes and encourages **autonomous, agile and collaborative forms of work**.

- We plan to keep strengthening the **digital skills** of our BMU staff. To that end, we are currently working with our staff representatives to adopt guidelines on good practice for digital work.

In all of our proposals, we are also being guided by the European ideal.

For us, sustainable digitalisation must also be European digitalisation. As the world's largest economic area, the EU needs to develop EU-wide standards that can be adopted worldwide, in the interest of protecting our planet. During the German EU Council Presidency in the second half of 2020, the BMU plans to work with all EU environment ministers to move a European vision forward in this area, along with measures for sustainable digitalisation. To that end, we are already consulting closely with other Member States and with the many other partners in Europe who are supporting us in this regard. After all, what Europe needs now are ideas that bring us all together.