Progressive Agenda for Europe

Technological Sovereignty: Democratising Technology and Innovation

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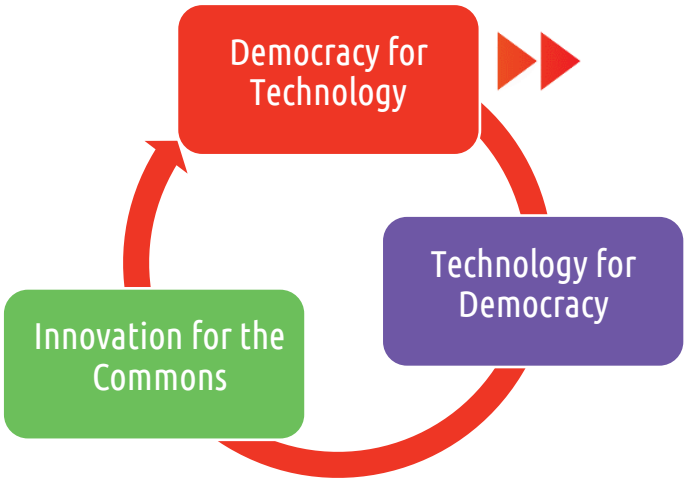

Preface

This is one of the "living documents" at the core of DiEM25's progressive agenda. With it, we propose policies and visions for a democratic future of technologies — and of the future of democracy in a technologised society. With the paper we have also enlarged our capacities for collaboration and, crucially, we have enriched our imagination of what is possible for democratic progress. Several previous drafts were created, and this paper is the outcome of collaboration amongst many DiEM25 members; many people have devoted their time to draft proposals for, give feedback to, and comment on the previous green papers. They believe, as DiEM25 does, that we need to enlarge the horizon of democracy to technology. Thank you for your time, ideas, support and motivation in making this a truly transnational project on one of the key transnational issues of the 21st century, the future of technology:

Claudio Agosti, Miguel Aristondo, Arne Babenhauserheide, Kris Bloch, Axel Dürkop, Annette Fröhlich, Bogdan Gradinaru, Regina Gruber, Edgar Hagenbichler, Benedikt Herudek, Louis Holbrook, Benjamin Kampmann, Christian Kasners, Stephen Kavanagh, Predrag Kolakovic, Peter Kolba, Carlo von Lynx, Diego Naranjo, Lukas Materne, Sepp Mattes, Peter F. Mayer, Anna Mazgal, Michaela Mersetzky, Olufemi Oshatogbe, Christos Piniatides, André Rebentisch, Marie-Anne Ries, Stefan Sakowitz, Franz Schaefer, Patricia Scherer, Megan Georgina Sherman, Sabine Speck, Harry Unger, and Travis Vowinkel, who provided input and feedback from Austria, Belgium, Czech Republic, Germany, Great Britain, Greece, Guatemala, Italy, Netherlands, Norway, Spain, the USA and other countries.

We would also like to thank all the translators of the previous and forthcoming papers for their precious work.

Inspirations came from Aral Balkan, decodeproject.eu, Timo Daum, Free Software Foundation, Commons Network and the Institute for Public Policy Research.

Credit for pictures of the characters in "And what would the world feel like?" goes to "Dr. Horrible manga" by juco (CC-BY-NC-SA — flickr.com/photos/julie_coulter/2764007691).

Still more people were involved, whose names could not be listed here. Thank you all.

The volunteers of the coordination team, who structured the discussion, gathered feedback, and synthesized different inputs to create this paper, are Joren De Wachter, Kate McCurdy, Christoph Schneider and David Schwertgen. You can reach them at techpillar@diem25.org. The point person in the DiEM25 coordinating collective is Renata Avila.

The publication of this paper is as much the endpoint (of an initial phase) as the starting point for the next steps. The future of the pillar "Technological Sovereignty: Democratising Technology and Innovation" is a collaborative task. Join with your ideas and actions to push progress, democracy, justice, sustainability and technology forward with us.

Get involved: There is a thematic DiEM Spontaneous Collective, "Technological Sovereignty 1 DSC", a group of DiEM25 members who are dedicated to discussing the democratisation of technology — you can reach the coordinators at demtech1@groups.diem25.org

The DiEM25 members forum is a place for continued discussion on this and other topics.

DiEM25 is an infrastructure for progressives from different places and political traditions — help us push the possible forward and build the future: www.diem25.org

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1. Introduction: For Democracy to Be Possible, Technology Must Be Democratised.

Technology Is Essential

Our civilisation heavily depends on technology. Technology provides us with the possibility to feed more than 7.5 billion people, to prevent or cure sickness, to multiply social and cultural interaction and creation, to care for those in need, to learn and teach more, to provide safety and security and to improve the quality of life and increase happiness in many ways for all.

But it is only that: a possibility. Not a certainty, and, today, often not a reality.

DiEM25 is the one political movement that wants to create, shape and drive political debate and democratic process around technology, based on the concept of Technological Sovereignty. Technological Sovereignty in our definition means the **right and capacity** by citizens and democratic institutions to make **self-determined choices** on technologies and innovation.

Why? Because technology affects us all, and all of us, not just a powerful few, must have a voice in its development. For DiEM25, it is clear that without the introduction of technological sovereignty through the democratisation of technology, democracy itself is no longer possible.

The examples are manifold. We see monopolistic digital platform providers with tremendous powers to shape what we see, who we hear from or how we think, without any democratic accountability for that power. We become subject to automated decision-making, wrongly labeled "artificial intelligence", functioning as a black box without any transparency or accountability.

But there's more. We see how the costs of technology's development and its usage are socialised, but the benefits are privatised to a very small group. We see how decisions on technological development are made by powerful, unaccountable private actors, and kept away from transparent and public debate.

Research and innovation must be beneficial for society and the prosperity of mankind. We must fight the absurd notion that the purpose of innovation is to make rich investors richer still.

We believe that start-ups and entrepreneurial process should not solely depend on venture capital and other financialisation schemes. The purpose of innovation is not only the aggregation of capital. To approach long-term solutions, we'll need sustainable public funding and the democratic inclusion of citizens.

And we are told that we can change everything at any time, as long as we play by the rules of the status quo and come up with the next "disruptive" innovation by ourselves. But these rules do not allow us to put common goals first — and they exclude democratic participation by design.

DiEM25 has a different vision. We know innovation can be beneficial to all. We want to **end** the practice of **socialising the costs** and **privatising the profits** from technological change. Instead, we want to foster innovations for the common good. We want to see an inclusive innovation ecosystem where all stakeholders, such as users, employees, citizens, and authorities are equally important. An inclusive system where women and other historically marginalised communities are empowered to actively participate in shaping our common technological future. A system in which society as a whole benefits from the liberated energy of socially responsible and democratically accountable entrepreneurs who are no longer shackled by the financialisation of their efforts. We believe in a positive and strong partnership of the public and private sector in creating and sharing knowledge, creativity, research, development, and innovation, to the benefit of the whole of society. And we also see the vast opportunities of commons and cooperative approaches that can be fostered with new technologies.

We are convinced that technological sovereignty through democratisation of technology is an absolute necessity for real equality in the technological era. We believe that Europe can become a beacon of hope if it unites political, social and technological progress — if it fosters a new enlightenment and puts the flourishing of all human beings in the centre of technological change. This could have transformative impact on a global scale.

The Relationship between People and Technology

Today people are increasingly defined as users or consumers of technology — sometimes even as the product itself — rather than citizens. Remember, when the service is free, you're not the user, you're the product.

But, as users, consumers or products, people are not empowered. They are not citizens who have a voice on how technology is shaped, who pays for it, and who benefits from it. They don't get the real benefits of the knowledge, research and development funded by their tax money. They are effectively powerless against the monopolies of the platform giants.

DiEM25 wants technology to reflect the values and diversity of the society to which we aspire. Our different genders, ethnicities, capabilities, values and — most importantly — our dreams, shall be supported by technology. Technology has to be set up in such a way that it liberates and empowers each of us to fulfill our vast potential, both as individual citizens and as contributors to the collective good. And it must support the ecological and democratic transformations necessary for our society's future.

That is only possible if we, as sovereign citizens, reclaim the ability to make self-determined choices, argue for different values and change the social and economic processes and powers that shape technologies. We can and shall develop technological citizenship in the 21st century, based on principles such as the commons, the capacity of self-organisation and the development of counter-power held by citizens and democratic institutions.

Technology has become a central form of power in society. This power must ultimately belong to the sovereign citizens of a technologised society.

Technology in DiEM25's Progressive Agenda for Europe

DiEM25 believes that, in a technologised world, Europe must occupy an important place of humane and responsible technological progress in cooperation, not competition, with others.

Europe must use its assets, such as its strong research and innovation landscape, its public traditions, the knowledge of its citizens and NGOs, its humanistic culture, its diversity and its inventive capabilities. Europe must democratise technologies and innovation, put citizens before companies, sustainability before narrow profit and responsibility before technological feasibility. The alternative is to become overwhelmed by the undemocratic technological and social models we see in Silicon Valley and China.

These models favour the few and exploit the many and the living world. They benefit huge corporations who exploit publicly funded technologies, which they aim to optimise, with global reach, for their private profit. In these models, the values of a powerful minority shape the technological futures for the vast majority. They are models with contempt for democracy.

DiEM25's Progressive Agenda for Europe demands a break with this model, and lays claim to technological sovereignty. Our European Green New Deal demands green innovation and a common share in the benefits of technological progress. Our European constitutional process will create a new digital public sphere. Transparent government requires transparent technologies. A dignified future for labour demands responsible technologies and a collective share in the benefits of automation. An ecological transition has to stop and prevent harmful technologies and foster sustainable alternatives. Culture shall be freely accessible, while cultural creation should be respected and rewarded. An open society that welcomes refugees and migrants needs to welcome technologies that can take part in human development. A feminist society committed to equality calls for technical solutions by, and for, people of all genders and sexualities.

Our vision of Technological Sovereignty demands that all of these perspectives shape innovation for the common good.

Last but not least, there is also a strong strategic case for Technological Sovereignty. No political movement will succeed without a strategy on how to deal with the changes that digitalisation and technological innovation have brought upon state, society and labour. In this paper DiEM25 presents ideas and strategies to democratise technology.

1.1. Three Interlocking Transformations to Achieve Technological Sovereignty

Within DiEM25, by crowdsourcing our collective knowledge, we have identified three key ways to achieve Technological Sovereignty. They are set out in much more detail in the following chapters. We try to define the issues, and provide short, medium and long term solutions, based on two processes: **Regulation** and **Renewal**.

Regulation means that, as a society, we take a collective responsibility to shape how technological actors should act or not act. We are not afraid to use the state (at all its levels, from the local authority to the EU) for its appropriate role of regulator, enabling and driving innovation and ensuring that not only costs, but also benefits, are shared across society. In addition, we also aim to include alternative ways of organising aspects of society such as the principle of the commons.

Renewal means that we need to innovate in the way technology and society interact. And we need to establish the conditions for social innovation and democratic societal transformation.

The first way is the establishment of a **Digital Commonwealth** in Europe. This includes:

- Countering the power of platform monopolies by
    - Strengthening regulations on Data Protection (GDPR) and ePrivacy to limit involuntary data extraction;
    - Enforcing mandatory cross-platform-interoperability and Portability of Data;
    - Ensuring stronger EU antitrust laws and better enforcement; and
    - Introducing the concept of Data Unions for collective representation.
- Building the infrastructure for a digital commonwealth by:
    - Opening up and democratising algorithmic Automated Decision Making (often wrongly denoted as "artificial intelligence (AI)") processes;
    - Decommodifying data through the establishment of a public data commons;
    - Creating a framework of digital rights for citizens; and
    - Supporting alternative business models to democratise economic structures, such as platform cooperatives.

The second way is for Europe to **democratise innovation** and ensure that knowledge is shared in such a way as to benefit as many as possible.

This includes:

- Reducing or abolishing monopolistic approaches to innovation, in particular around Intellectual Property; and
- Ensuring that the benefits of investment in innovation are available to as many as possible, and reverse the trend of **socialising costs** while **privatising benefits** of innovation.

Third, Europe must **democratise the governance of innovation** and technologies. New institutions and organisational forms in politics and the economy must be envisioned and put into practice. Digital technologies can help us build these.

This includes:

- Opening up and democratising the processes by which technological development is funded, prioritised and decided; and
- Using technology to enable democratisation of decision-making processes at every level, especially to foster economic democracy.

The democratisation of technology is possible, and necessary. **Technologies are never inevitable**. They are always based on choices, values and social power. We can make different choices, argue for different values and change the societal processes and powers that shape technologies. Technologies that, in return, shape society, and us.

2. A Digital Commonwealth for the 21st Century

More and more, all that we do – our activities online, offline, at home, at work, with friends, with families, with strangers – and all that we are – our physical, psychological, and social identities – is captured in digital form, only to resurface in aggregate as the data driving mass social transformation and unprecedented accumulations of value. Though we all contribute to this process and feel its effects, the decision-making power is retained by a handful of powerful actors, notably platform monopolies. To **democratise the development of digital technology**, we must:

- counter the power of platform monopolies, through:
    - anti-trust enforcement,
    - stronger privacy regulation,
    - platform interoperability, and
    - collective representation of data producers, i.e. data unions;
- and lay the infrastructure for a digital commonwealth:
    - decommodify data through a public data commons,
    - support democratic economic structures for data-driven innovation, e.g. platform cooperatives, and
    - establish a digital rights framework for citizens.

2.1. Democratising Platform Monopolies

How they work

Digital technologies are at the heart of the ongoing technological transformation we see all around us. Since the spread of Internet technologies from the 1990s onwards, our lives have been enriched with an explosion of digital technologies and devices, our ways of communication have shifted and our modes of coordination have undergone rapid change.

The digital transformation encompasses many positive elements and opportunities to improve people's lives. Our access to knowledge is growing, it is easier to communicate and connect with others, and novel creative spaces have opened up. The digital economy has created many new products and services and strengthened connections across the world. However, this transformation has also yielded ambivalent and negative effects. The communication revolution has brought us overwhelming complexity, the spread of misinformation and collective nervousness. The digital economy is automating jobs and consolidating monopolistic structures.

Many of these negative aspects, however, do not follow from the properties of digital technologies as such, but rather from the ways in which they are used and governed, i.e. the societal structures and contexts of these technologies. The current state of capitalism has led to surveillance and platform monopolies forming technological empires with illegitimate power over the lives of billions of people.

The market dominance of a handful of platform businesses relies on two core principles — the **network effect** and the **lock-in effect**.

The network effect is quite simple: the more people use a certain platform, the more valuable it becomes for everyone. The lock-in effect is also well known to people using e.g. social network platforms: the more you integrate the service in your daily life, the more dependent you become on the service. Extraction of big data from the growing user base is key to this huge market dominance. Every person who uses digital services is creating a valuable economic and social resource in the form of personal data.

The underlying economic structures, worldviews and cultures – which have gone global – take their users' attention as the product to be sold to the highest bidders. The data that is extracted and privatised is used to constantly manipulate individual and collective behaviour. These systems sell our freedom to destroy it. In a standard Silicon

Valley sales pitch, people are not citizens with rights, virtue and dignity, but consumers to be manipulated by marketing, and data points to be tracked and sold as commodities.

Vast digital infrastructures and datasets have been built and privatised in the hands of a tiny and largely unaccountable economic elite. These very datasets are then used to shape and train automated systems that are being offered back to us "as-a-service".

Work formerly executed by both experts and low-skilled-workers is now done by users, who create valuable data that is constantly fed back into the system. Workers are not compensated for the data which they generate on the job, and in so doing, train their own robotic replacements.

How We Can Constrain Their Power:

Short-term Measures

2.1.1. Strengthen ePrivacy Regulation in the EU

The basic step to tackle the dominance of platform monopolists is to regulate the use of personal data, strengthening user rights and empowering Data Protection Authorities to enforce these rights.

The General Data Purpose Regulation (GDPR) and the upcoming ePrivacy Regulation are steps into the right direction but certainly not enough. The ePrivacy Regulation is supposed to protect confidentiality of communications and personal data (such as location data, browsing data, device usage patterns, mobile app use, search queries etc.) in the electronic communication sector by complementing matters covered in a general way by the General Data Protection Regulation (GDPR). The ePrivacy Regulation is meant to be the main framework to protect online communication. We must ensure that in the final version privacy, data protection and other fundamental rights are fully respected.

Strengthen data protection regulation in the following ways:

- Higher level of **Privacy Protection By Design** and **By Default** instead of "Privacy By Option". This explicitly includes the obligation for hardware and software providers to implement default settings that protect end users' devices against any unauthorised access to — or storage of information on — their devices.
    - All types of location data should be given a high level of protection as they carry a high privacy risk. Technical solutions based on local computation in the end-user's device should always be preferred over centralised tracking.
- **Strong requirements for meaningful user consent**. The request for user consent should be as user-friendly as possible and only for permissions that are crucial to perform the main task(s) of a software/app/smart device. Forced consent mechanisms and "All-Or-Nothing"-Consent (e.g. cookie walls) should all be prohibited. Guidelines for meaningful consent should follow sectoral industry regulation where such regulation exists, or else be based on the specific activity for which consent is sought.
    - No "legitimate interest" exception to use communication data (email, voice mail, chat, videoconference, VoIP) without explicit user consent or a given emergency.
    - Protect users against third party tracking: ban the sale of data to third parties absent meaningful consent.
- **Data Protection Authorities under parliamentary control** – like European Data Protection Supervisor (EDPS) and the European Data Protection Board (EDPB) – will be in charge of monitoring the application of the proposed regulations.
- **Restrict state-enabled corporate surveillance of the public**, e.g. when private contractors perform sensitive and necessary public services such as census data collection and processing.

Mid-term Measures

2.1.2. Enforce Platform Interoperability

To re-open the monopolised social network ecosystem for competition we demand to legally enforce **cross-platform-interoperability** for communication across different platforms. Telecommunication providers are forced to open their network to smaller players and to interoperate – this is how we can call each other across different providers. There is no reason why social networks should not be subject to the same policy.

Mandatory cross-platform-interoperability could be achieved by, e.g., standard basic services with end-to-end-encryption to which different services could attach, supporting data portability. In practice, this would mean that you could communicate with people on different platforms without having an account for these platforms or handing them your personal data.

Social media should be seen and regulated as a public utility. This includes substantial public funding for the development of open and decentralised alternatives that embrace:

- Interoperability
- Data Portability as described in Article 20 of the GDPR (the right to convert and transfer user data/media to a secure location or to import it to another service)
- Mandatory anonymised, authenticated and end-to-end encrypted digital communication
- privacy-preserving identity authentication tools

2.1.3. Stronger Antitrust/Cartel Laws

To enable fair competition in the realm of Platform Capitalism and the Digital Single Market we need **stronger EU Competition Laws**. Regulative bodies like antitrust divisions and cartel authorities shall ask for strong data protection compliance upon corporate mergers. In addition, regulators require additional criteria to evaluate abuses of market power such as:

- network effects and lock-in effects
- access to data relevant for competition

An effective valuation of market power has to keep the whole economic ecosystem in check.

Key regulative measures of these agencies will include to:

- Split up platform monopolies and other businesses that have become too large
- Share (anonymised) datasets of big players with public entities or NGOs — to create public/municipal data commons
- Oversee businesses and corporations
- Collect fines

2.1.4. (Digital) Taxation

To further limit the negative impact of platform monopolies and automatisation it is necessary to close the tax gap. We have to **fight the tax evasion of platform companies** and **create a digital tax** on the collection/processing and sale of personal data.

2.1.5. Introduce Data Unions

A key characteristic of platform monopolies is the structural power imbalance between the platform and those who produce the data harvested by the platform, be they users or workers.

(To clearly illustrate the imbalance we will refer to platform users as "data producers" in this paragraph.)

This imbalance is very clearly illustrated in the bargaining power of data producers in respect of the terms and conditions: there is no such bargaining power. A data producer must simply accept, or be banned from a platform that may be essential for certain aspects of their lives (in which such platforms resemble public utilities); a platform worker must simply accept having their data collected, or risk losing, at worst, the income they need to survive.

The proposed solution is the **collectivisation of data producers through the creation and legal recognition of Data Unions**: representative organisations of data producers on digital platforms, who will be granted power for activities such as negotiation of terms and conditions, collective legal action on behalf of data producers, and other measures of structural redress.

In an extension of anti-trust measures, **platform monopolies will be required to contribute funding for the organisation of Data Unions**, although any attempt to use funding to exert influence must be strictly curtailed. Data Unions retain the right to be involved in negotiating major changes in the running of the platform. This is necessary to counterbalance the power of the owners of the platform with the interests of its users and data producers.

2.2. Towards a Digital Commonwealth

Data Collection, Algorithms and AI, or "Automated Decision Making"

The problem is not limited to the platform monopolists, but also applies to the state and other actors who collect and use data.

This includes all aspects of algorithmic automated decision making (often mislabeled as "Artificial Intelligence"). In order to be clear, this paper uses the term **"Automated Decision Making" (ADM) instead of "Artificial Intelligence" ("AI")**, because the use of this concept helps much better to clearly set out the issue: how are those automated decisions made? And who decides how they are made? We see today how the expansion of information technology has not been accompanied by expanded democratic control, resulting in a massive concentration of power and surveillance capabilities in a few hands, and little accountability or oversight by the public.

Artificial intelligence is, today, often neither artificial — its "magic" veneer obscures the all-too-human labour and decisions that shape its development — nor intelligent, as it reflects a blinkered set of powerful interests over all others. Instead of opening our eyes to new possibilities of a free and equal society, ADM is used to consolidate existing hierarchies and explore new mechanisms of control.

Need for a New Paradigm

It is time for a new paradigm of the digital economy. A paradigm through which we establish new forms of ownership and governance of data and digital technologies, guided by democratic principles. A paradigm that unleashes the power of data and digital technologies for the common good and that helps to usher in an innovative, democratic, socially just and ecological transformation of our societies and economies. Moving towards such a digital commonwealth in which we will collectively benefit from the digital transformation will help us create a mixed and democratic economy. It will help us gain more democratic rights and to become free and sovereign in our technological choices, as individuals and societies.

For DiEM25, citizens in a digital commonwealth

- know, and can exercise, their clearly defined **rights** as data subjects;
- democratically **govern** the use of data, setting its scope for private purposes, and harnessing its power for the public good;
- have recourse to **institutional** means of enforcing their rights, such as independent, public data audits; and
- can democratically counter imbalances in **economic** power through alternative business models such as platform cooperatives.

Long-term Measures

2.2.1. Democratising the Economy: Alternative Business Models

Democratising structures of economic ownership can counter the consolidation of power of today's platform monopolies. Platform co-operatives are models of economic exchange which are owned and governed by workers, users and other stakeholders, and often have social and ethical objectives. The EU should support such economic approaches. For in-depth discussion, please see Chapter 4.2.

2.2.2. Decommodifying Data: Personal Data Storages, European Data Commons

The value of data relies on aggregation: data becomes more valuable when collected and shared. As a private commodity, data can be used in unaccountable ways, potentially facilitating manipulation, surveillance, and control; however, as a common good, data can contribute much to cooperative and collective purposes.

Data Commons are a way to aggregate data in a safe, anonymised, transparent and democratically controlled way. Data Commons may incorporate a combination of personal data, city open data, public research data and private data. Decommodified data could unlock the power of data-driven technological innovation in the service of common goals and ends — under the direction of public interests rather than private profit.

The main challenge for Data Commons is to create a legal and economic framework in which people want to share their data — and its potential economic value — in a controlled way for the common good. This needs to be backed up by technological solutions that enable the enforcement of rules for data sharing and prevent the misuse of data.

The long-term vision here is the concept of shared personal data with strong **democratic governance** as a common resource for innovation. Users would host their private data on a Personal Data Storage — a secure location of their choice — and have full control on how to share data and interact with online services. A Personal Data Storage may be – for instance – a decentralised, anonymous and encrypted peer-to-peer-network that takes user data and splits it up into encrypted chunks, which get processed by hundreds of other computers across the network. The crucial aim here is that no raw data is revealed to third parties.

Besides democratic governance, such a European Data Commons needs to ensure **democratic ownership of data** which is collectively produced. Third parties wishing to use the data would be subject to licensing requirements, taking into account factors such as company size, intended purpose of data processing, and mechanisms to ensure accountability.

The income of the Data Commons would flow into the fund for a universal basic dividend, proposed in DiEM25's Green New Deal for Europe. Citizens, research institutions, public institutions, small companies and non-profit organisations could all use the Data Commons as their free, common resource.

2.2.3. Introducing Digital Rights

We demand that a new framework for digital citizens' rights be recognised, enforced, and democratically governed by the inhabitants of Europe.

- **Right to Encryption**: All citizens have the right that their digital information and communications be conveyed to the intended targets using strong encryption, to prevent interference or eavesdropping from governments or other third parties.
- **Right to Computation**: All citizens have the right of unconditional and unlimited access to public computing resources and infrastructure.

With regard to the use of algorithms in everyday life, we demand that the following rights be recognised:

- **Right to an Algorithmic Opt-Out:** An "algorithmic opt-out" rule shall be established: for any algorithmic service, a user can choose to receive an outcome with a "default" profile (i.e. with the user's personal/demographic attributes removed from calculation).

- **Right of Interaction**: Citizens have the right to know when they are or aren't interacting with an algorithm.
    - When an individual receives an outcome from a service that is based wholly or partially on algorithmic computation, this should be clearly and transparently communicated.
    - Automated decision-making systems are not allowed to "conceal" themselves in interactions with unknowing citizens.
    - On the other side, companies are not allowed to "conceal" human data processing to users who believe themselves to be interacting with an algorithm.
- **Right of Equal Treatment:** Citizens have the right to be free from algorithmic discrimination.
    - If algorithmic services provide outputs of consistently lower value or quality to or about users coming from historically marginalised backgrounds, this constitutes discrimination.
    - Users should be able to compare outputs based on different demographic profiles (e.g. "would this search result be the same if I were to change the gender or age the algorithm has inferred for me?").
- **Public Audits**: the EU shall develop an independent public institution to conduct algorithmic audits in a transparent manner, with resources allocated proportional to estimated scope of a) affected citizens and b) potential harms.

2.3. And What Would the World Feel Like?

Paul, 33, Berlin

Paul is a freelance writer and part-time chef de cuisine. He lives in an urban area and receives electricity from a cooperative of electricity prosumers – people who produce electricity at home. The cooperative largely depends on data provided by the members to optimise their distribution strategy. Paul has decided to share a roughly localised but anonymised dataset, where he shares his weekly schedule, vacations and business travels – and other data that helps the cooperative to plan ahead. He did that by choosing a smart-rule on his reliable and easy-to-use home data storage. Paul feels good about being able to choose how and with whom he shares his personal data. He can do so with the certainty that legislation and data protection authorities will safeguard and enforce his rights.

Paul also shares his data with many other cooperatives and municipal services. For instance, he shares photos of his delicious vegan cuisine on his social-networking node, so everyone who follows him on various public and private social networks – via the open-standard-protocol – can see his content. However, Paul has restricted the usage of his content for advertising purposes to local home delivery and city-guide cooperatives, of which Paul is a member.

3. Free Knowledge for Democratic Innovation – the Role of Intellectual Property and Education

Innovation depends on high quality public life and public services. Creative societies and economies need the infrastructure to support them: well-functioning education and research systems, guaranteed protection of rights and various other forms of state support such as targeted monetary subsidies. Knowledge has always been a product of human collaboration. Our vision of technological change must reflect these needs, and contribute to public life and the common good in turn.

3.1. Transforming Intellectual Property (IP)

Intellectual Property (IP) is a system of government-created and -enforced exclusive rights (legally created **monopolies**) on certain aspects of creativity and innovation. They include e.g. patents, copyright, trademarks, trade secrets, database rights and other similar rights.

There are two standard justifications for IP: recognition and reward. The reward justification argues that IP protects the creator or innovator, by providing them a monopoly that is limited in time and scope, so they can benefit from the ability to recover their investment. After a time, the monopoly lapses, and the invention or creation becomes part of the public domain — i.e. the classical freedom of enterprise, where everything that is not forbidden is allowed, regains its normal place in the market. The recognition justification consists of the argument that IP recognises creators and inventors, and their contribution to society.

There are a number of problems with IP today.

First, there is the continued **expansion** of the monopoly rights. Copyrights, originally 18 years long, now last at least until 70 years after the death of the last contributing author (and for Disney a bit longer). Patents used to be for narrow, technical applications (“downstream” aspects of technology), but now apply ever more to “upstream” aspects of technology: methods (i.e. ideas), protocols, discoveries (e.g. in the field of biology), software and many other aspects that used to be non-patentable. In addition, the standards for "novelty" are sometimes laughable. To give a classic example, in Australia, after a patent law reform, someone managed to obtain a patent on the novel invention of the "wheel". Furthermore, new IP rights are invented on a continuous basis — examples include database rights, trade secrets, performers rights and the new secondary copyright for publishers in the draft Copyright Directive.

The public domain is under continuous attack from privateers.

Second, the link between the creator/innovator and the IP right is no longer functional. The full transferability of IP rights has the practical effect of allowing **hoarding** of monopoly rights to the place in the economic value chain where they produce the least benefit: with marketers and distributors. The actual creators/innovators typically get little to no benefit from or recognition for their contributions.

The consequences are seriously problematic. For example, while public money provides for most Research and Development (R&D) in developing new drugs, we see that the R&D budget of large pharmaceutical companies is a fraction of their marketing budgets, and most of their R&D budget is spent on researching "me-too" patents: patents on slightly different versions of drugs that already exist, in order to artificially extend their monopoly position (and charge higher prices). It is a classical example of socialising the cost and risk of developing new drugs, while privatising the benefits. The same is true for other innovations and research at universities and other research centres funded with public money. Far too often, the results of such publicly funded research are privatised, often in opaque and non-transparent ways, through the creation and transfer of IP rights to privately held spin-offs.

Third, IP rights have a number of negative effects on the economy and society. The rent they extract generates huge transfers of money to a limited number of corporate monopoly holders and their shareholders. This leads to a very regressive income distribution and **drives economic inequality**, as people who work pay rent to those who hold government-created monopolies on the proceeds of that work. In addition, in many countries IP monopolies enjoy tax exemptions or preferential treatment. This allows large multinationals to shift their profits

and benefit from tax forum shopping, driving further inequality as these revenues are hoarded rather than taxed and redistributed for the public good.

IP rights, today, seem to significantly **slow down innovation**. Through IP claims, large established businesses use ever-growing monopoly rights to block access to their market to newcomers or competitors. Initiatives like the draft Copyright Directive allow copyright to be used as a way to censor content, further reducing the freedom of communication that the Internet originally promised.

In the discussion on the draft EU Copyright Directive, the monopoly holders of content (the entertainment industry) are fighting with the monopoly holders of the tech industry. But who defends the interests of consumers, citizens and creative people?

Short-term Measures

3.1.1. Fair IP Rights

Reversing the tax treatment of IP is the easiest immediate step to take. This means that any preferential tax treatment of royalties or other income (rent) deriving from IP, such as lower tax rates or higher exemptions on such income, must immediately be withdrawn. They should be replaced by the opposite: income from IP (rent) must be taxed preferably at higher rates, and more progressively, than income from selling actual goods or services.

In addition, the draft EU Copyright Directive must be fundamentally reviewed, in order to obtain much more balanced rights of users, re-users, creators and innovators. A European "**fair use**" concept must be created, with broad applications, and based on the fundamental principle of freedom of speech.

Introduce a general principle of IP release: any IP belonging to a legal entity which either goes bankrupt, is liquidated or otherwise ceases to function, must be released into the public domain. Equally, any IP ceases to be valid on the death of the inventor/creator.

3.1.2. Public Money, Public Code

With immediate effect, public authorities must switch, where possible, to using Free and Open Source software.

Any patent on software functionality may only be awarded subject to full disclosure of all source code related thereto.

Public funding of Free and Open Source software platforms or core technologies should be envisaged.

Mid- and Long-term Measures

The mid and long-term measures around Intellectual Property are all based on the same principles:

- the cycle of “socialising costs and privatising benefits” that currently exists must be broken
- the privatisation of benefits through the state-enforced monopolies of Intellectual Property rights must be reduced in terms of scope and duration

Innovation that is funded by public money should remain accessible to all, by default under the most permissive license systems. In practice, we propose the following principles and practical steps.

3.1.3. Free and Open Knowledge and Licensing

Any technical development, including software code, that is funded by public money should be made available under licenses equivalent to **Free and Open Software licenses.** (Note: DiEM25 does not have any a priori preference for any category or set of licenses. We are aware that there is a whole ecosystem of software and creative commons licenses, and, depending on context and the area, the choice of the appropriate license will have to be made. We do not believe in a "one size fits all" approach in this context.)

This has several benefits: it provides for independence from non-EU based suppliers, it increases the security and stability of the software and it breaks the de facto monopoly of many technical platform providers.

While exceptions can be possible under strict circumstances, any such exceptions must be accompanied by a practical mechanism to ensure returns to the public from the proceeds of any monopoly granted. For example, the EU might require that any spin-off created to monetise the result of publicly funded research has to grant, on incorporation, 20% of its shares as non-voting shares to the authorities that funded the research.

In addition, DiEM25 wants to put barriers around the public domain and prevent the enclosure of the **commons of knowledge**, by establishing certain areas of knowledge outside the reach of IP rights. This will include a ban on the concept of IP rights on anything invented or created by machines, and the introduction of a principle that any information "found in nature" will be and remain at all times in the public domain. Biological information carriers such as DNA or RNA must be classified as "Open Content" languages, and not subject to any IP right.

3.1.4. Principles of “Right to Repair” and “Open Standards”

DiEM25 will introduce a fundamental "**Right to Repair**": the buyer of a product or service has the right to repair any aspect thereof (or have it repaired for them) and IP rights cannot be used as a means to block such Right to Repair. The Right to Repair includes the right to alter the technical standard in which something is made or captured. This means that if you buy something in one technical standard, you have the automatic right to convert it into another technical standard.

DiEM25 will introduce the principle of **Open Standards**. Technical standards must be documented so that interoperability is ensured, and they may not be subject to IP monopolies.

3.1.5. Tackling Planned Obsolescence

Planned obsolescence is the practice of designing and selling products with an artificially limited useful life. They are programmed to break down much earlier, and repair is made expensive, so consumers need to replace them. This leads to a substantial amount of waste. In line with our ecological goals we want products that are durable, repairable and/or upgradeable. In practice, this means the following:

- Consumers should have the option to have their devices repaired by an independent party. Any documentation or product guarantees that prohibit this should be banned.
- As a general rule, all spare parts should be replaceable, and available on the market. If the original manufacturer no longer provides such spare parts, they cannot block anyone else from providing them.

3.1.6. Reform Copyright

DiEM25 wants to fundamentally alter the approach to copyright. This includes the harmonisation of exceptions to copyright, by introducing a "fair use" concept with broad application, based on **freedom of speech**.

In addition, DiEM25 proposes a fundamental reform to the Berne Convention on Literary and Artistic Works of 1886, by updating it and making it suitable for the digital age. This includes measures such as making copyright subject to registration, and payment of a fee that increases with time, forcing collecting authorities to provide full transparency on the rights they claim to represent, the costs they charge, and how much they pay to the right holders, and reversing the burden of proof in copyright: unless something can be shown to be clearly under copyright, it must be in the public domain.

3.1.7. Reform Patents

DiEM25 wants to open a **debate on the patent system**: should it be abolished, or should it be reformed so that it can fulfill its original ambition of rewarding inventors and sharing the ir knowledge and innovations throughout society?

In any case, it should become much easier and cheaper to disable a patent when it does not cover something that is actually novel.

3.1.8. General Reforms to IPs and their Tax Regime

DiEM25 wants to limit the enforcement of IP rights so that it benefits the actual inventor/creator, not their assignees/licencees when they do not contribute economic value. This will increase the inventor/creator's recognition, and ensure that they actually benefit from the IP monopoly that government creates for them.

Finally, DiEM25 wants to abolish any tax incentives to create, transfer or collect IP rights, and create a special tax on the rental income of existing IP rights as a contributory funding for the Universal Basic Dividend as proposed in the European New Deal.

3.2. Education and Technology

What are the Issues?

Knowledge is power. If we want to democratise technology, and start the debate around how society determines which technologies are developed, which are supported, how they are regulated and whether some should be banned, we need to ensure that informed debate is a priori possible.

Leaving everything to the experts is not a solution. Their expertise always comes imbued with opinions and values, containing an implicit a view of society and how it should function – in other words, with a political view. Even if they deny it (especially if they deny it), the political views of technical experts should be viewed with normal democratic scepticism.

Decisions are never without value. But in order to be able to judge the values that are applied in decisions on technology, it is often necessary to understand, at least to a certain extent, the technology concerned.

Democratic debate assumes "Mündigkeit", and this is where education plays a key role. Education, not just of the young, but the elderly as well, who are sometimes lost amidst the new technologies emerging around them. And of the civil servants, who must frame and administer the political discussions around technology. How a problem is presented within a certain bureaucratic system is often key to the solutions that are deemed "possible".

Finally, we know there are serious issues of gender equality and representation in science and technology, and in the many government, quasi-government and private bodies that take key decisions in this area.

So the key issue is: how do we, as a society, promote and ensure the knowledge necessary for a proper **democratic debate around technology**?

Short-term Measures

3.2.1. Open Up Debates on Technological Regulation

Introduce a general principle of **transparency**: any EU regulatory process (legislative, administrative or otherwise) that relates to how technology affects society should be fully transparent, not only in relation to the content of what is decided, but also with respect to the process (e.g. meetings with lobbyists, etc).

Mid- and Long-term Measures

3.2.2. Modify Education Curricula to Include Principles of Technological Sovereignty

Education systems and curricula should be updated to ensure that education allows for students to obtain "Mündigkeit" on technology matters.

This means not only teaching the basic principles underpinning technology as such (a minimum requirement of STEM for every student), but also explaining the relationship between technology and society, e.g. by pointing out alternative systems such as the commons and other economic models of technological development and management.

It is clear, in this respect, that our education systems should reflect, and educate, much more regarding the interaction of technology and society, and the concept of Technological Sovereignty. Approaches such as MOOCs (Massive Open Online Courses) can play a crucial role in this respect, providing a publicly available repository of knowledge and understanding.

Education via the Internet revives a classical social topos: educating and empowering people. Today, courses by the best experts and most renowned teachers are accessible to many people across the globe. While this is a fantastic development, the accelerating technological change requires a more systematic approach to allow life-long learning, e.g. via extended sabbaticals and learning credits. Rather than burdening individuals with the obligation to use their own time and resources in learning and gaining new technical skills, public and private support is needed to ensure flexible education can truly serve everyone.

Access to life-long learning is a right. Not a duty.

3.2.3. From Open Standards to Technology that can be Understood

The principles of open standards and the Right to Repair lead us to a possible "**right to understand**". The EU should investigate a potential requirement for owners of technology to provide sufficient information to the public such that the general principles of how their technology works can be understood by people with sufficient training in the relevant area.

Of course, there would be justified concerns around safety and security, but, as we know from the real life experience of open source software, it is typically proprietary (and secret) technology that presents the highest risks to security, with increased vulnerability to hacking and potential abuse of flaws.

3.2.4. Technology for Everyone

Public authorities should ensure that the debate on technology's development and regulation is conducted, not in backrooms full of industry lobbyists, but with participation of **all stakeholders**. Initiatives for technology assessment and public participation in science and technology need to be strengthened and in some cases made mandatory.

In addition, other stakeholders (e.g. consumers, workers, the public at large, public authorities) should have observation functions or guaranteed representation in the decision making bodies (board of management) of companies that make technological decisions with a significant impact on society – similar to how, under certain conditions, governments are entitled to appoint observers to the boards of financial institutions.

There is a growing sphere of organisations that foster public and open uses of technology. Europe has hundreds of maker spaces, FabLabs, museums and educational institutions that experiment with technology and knowledge oriented towards commons and society. New ways to support such projects should be found.

3.3. And What Would the World Feel Like?

Pierre, 41, Paris

Pierre is a scientist with a PhD in biological engineering. He works in a research collective that has been facilitated by several European universities. As his team is devoted to transparency and accountability, when it comes to their research, Pierre's job is to provide sufficient information to the public, so that the general principles can be understood by people with sufficient training. This is not only supported by the scientific community, but also necessary to help the general public to benefit from the research. This includes the use of a permissive patent system that doesn't prevent the conceptual aspects of their research from being used by other public and private entities. The collective considers it self-evident to use Free and Open Source Software.

Pierre is also a fairly talented guitar player and shares his work under a Creative Commons license that allows other artists to build upon his work, as long as they apply some kind of remix or artistic editing.

The city of Paris recently started an initiative of measuring the air-quality and correlate that with biometric data of citizens doing outdoor sports. Pierre is participating, as the resulting datasets will be released as open source data for the scientific community.

4. Democratising Innovation and the Economy

What are the Issues?

Every technological development is the result of choices. Choices made by governments, researchers, investors, consumers, manufacturers, distributors, users and many others. No technology is god-given or given by the "invisible hand of the market", and no technology is neutral: it is always value-laden. The way we fund, adopt, use and regulate technology, or not, reflects society's choice of its values and priorities. However, decisions in research and innovation currently reflect the worldviews and interests of technocratic researchers, policy-makers and above all venture capitalists that want to take research "to the market", i.e. want to maximise their profits.

To every technological option there are always alternatives – including non-technological forms of change and problem solving. We must establish the necessary **democratic instruments and institutions** capable of addressing the complexities of inclusive 21st century technologies. How do we define the problems that technologies should solve? How do we govern the risks and ambivalences of technologies? How do we make sure that their benefits are shared amongst the many?

An agenda to democratise technologies must **address the fundamental structures that shape and govern technologies**. To democratise Europe we need to also transform the societal, political and economic systems that innovate, shape, regulate and make use of technologies. How can these become more democratic and inclusive? How can we democratise the innovation processes that shape decisions about our future?

4.1. Democratising Innovation Funding

DiEM25's European Green New Deal proposes a Green-Investment-driven Recovery and a new agency for managing and funding Europe's Green Transition and Green Energy Union. These measures make use of the risk-taking, mission-oriented funding powers of public institutions and put idle financial wealth to socially useful purpose by boosting a transition into a greener economy that works for the many.

The European Union is already a major funder and decision-making body shaping the research that affects our lives. In the ongoing program "Horizon 2020", the EU aims to spend 80 billion € to fund research and innovation in the years 2014 to 2020. The following program "Horizon Europe" entails 100 billion € for research and innovation funding in the years 2021 to 2027.

While the programs are proposed by the European Commission and debated in the European Council and the European Parliament, the individual funding decisions are taken in a technocratic manner by Brussels bureaucrats, lobbyists and scientific experts. It gets even worse when we consider venture capitalists, whose deep influence on the start-ups and entrepreneurs pursuing creative new technologies pushes investment based on the short-termist and narrow pursuit of maximum profit.

We need to build alternative and democratic forms of funding research and innovation, so that the technologies of the future will be democratically determined right from the start. **We have to put citizens in charge of the decisions that shape technology**: research and innovation need to become accountable to citizens and their needs and expectations. This explicitly includes decision making by separate executive bodies as long as they are transparent, accountable and elected democratically.

Short-term Measures

4.1.1. Open Up the EU's Innovation Funding to Increase Public Value

The EU's research and innovation funding has a major deficit: it is premised on a "high-tech for growth" strategy, directly playing the tune of big industry and a "technology first, society second" symphony. This needs to change. The EU's funding needs to be opened up to purposes which serve the social good.

4.1.2. EU Funding for Purpose before Profit

We need to fund social and cultural innovation in concert with technological innovation. Different forms of creativity and transformation need to be combined to move into a brighter future, and funding should be distributed among a broader group of recipients. EU funding for research and innovation must be more easily attainable for civil society organisations, non-profit technology projects, cooperatives and others with a clear mission of green and social change. We need to fund purpose before profit from public money. There must furthermore be democratic oversight of the funding process. The EU should hold **stakeholder assemblies** for each funding instrument, involving citizens, researchers, NGOs and others in assessing impact.

Furthermore, the returns to research and innovation funding should recognise and support the public life and public institutions on which they depend, e.g. universities, and the collaboration and collective creativity that made them possible. Today if a product is innovated with EU funding the profits of its marketisation are completely privatised. We propose that a dedicated percentage of returns from these publicly-supported products contribute to the fund for the **universal basic dividend** as set out in DiEM25's European New Deal. This gives society a fair return on its public investment in technological development.

Mid-term Measures

4.1.3. Participatory Budgeting Platform for Research and Innovation

We propose a digital platform for participatory budgeting on a transnational level. This platform will be a 21st century institution that democratises the funding of research and innovation within the EU, giving citizens and civil society a stronger say.

Democratise Funding: Citizen Crowdfunding

The platform needs to contain a crowd funding system that allows European citizens to allocate public money, e.g. from the EU's "Horizon Europe", through their decisions on the platform. The projects apply with their proposals and a sum of money that would allow them to start the work. As in crowdfunding, if enough citizens allocate public money to a proposed project it is successful and gets money from the fund. A significant proportion of public funds for research and innovation needs to be put into this platform to give citizens a voice.

Democratise Agenda Setting: Citizens' Needs Crowdsourcing

Innovation starts with problems that should be solved. Who defines the problems is a major issue in every innovation journey. In a democratic society, citizens should define the problems that innovations should help to solve. Therefore, the platform should also enable citizens to identify problems to be addressed through research and innovation. Problems would be freely submitted, then democratically ranked on the platform. Researchers and innovators can then apply with proposals targeting specific problems. In this way, purposes for innovation can be democratically defined by citizens rather than steered by unaccountable private interests.

4.2. Democratising the Economy

To democratise research and innovation we also need to find ways to democratise the economy and to foster more decentralised economic arrangements, collective decision-making and structures for shared responsibilities. In short, we need to democratise economic decision making and ownership of technology and organisations. DiEM25's labour pillar addresses the need for worker participation in companies.

Digital technologies are already being used to coordinate and to govern economic processes. This hints at a big opportunity to shape economic systems in the 21st century. We need to democratise these technological capabilities, and and shift their application from the accumulation of profit to a radically different challenge: to shape economies that foster social justice and help to keep our production and consumption within planetary boundaries. Technologies such as the Internet of Things, robotics and machine learning offer vast potential to transform how we coordinate our lives and activities. **It is imperative that this revolution in coordination is democratic at**

its heart. If not, technological authoritarianism will further emerge. We must envision how ideas for real progress, such as that of an "economy for the common good", can be implemented and democratically governed in such systems. Concretely this boils down to questions such as: whose values and interests will program automated traffic systems, smart grids for sharing energy or automated agricultural technologies, and who will benefit from these technological powers? The capacity of these technologies is too vast to remain in private hands. It must belong to citizens.

Short-term Measures

4.2.1. Levelling the Playing Field for Platform Cooperatives

Digital technologies can help to create new and more democratic organisational forms for economic activity and for governing infrastructures. Very promising ideas and developments are ongoing in the movement for **platform cooperatives** where the aim is to make workers, users and other stakeholders the **owners of platforms** that coordinate economic activities, e.g. taxi drivers owning and operating their own digital platform to constrain the dominance of platform monopolies.

Effective taxation and regulation will pave the way for the development of platform co-operatives – models of economic exchange which are owned and governed by workers, users and other stakeholders and often have social and ethical objectives. Instead of trying to imitate Silicon Valley, the EU must strive to create a democratic and collaborative digital economy that has social justice and environmental justice hardwired into its structures.

Mid-term Measures

4.2.2. European Innovation Foundation for the Common Good

Instead of waiting for Silicon Valley to be in charge of technological breakthroughs for private gain, Europe should invest in shaping technological breakthroughs for the common good. This organisation shall envision, coordinate and conduct research and innovation into **technologies for the common good, for democratic governance and ownership of technologies**. It will be governed by the European parliament and European citizen assemblies. It will have the political mandate to foster innovation for the common good, such as achieving the Paris Agreement's goals, the UN Sustainable Development Goals and other principles for the common good as agreed in the EU.

The foundation may only invest in projects that are based on democratic ownership and governance. Its success is measured not in patents, economic growth or other commercial indicators but by the increase in quality of life of present and future generations. We propose several initial focus areas:

- **Labour Intelligence**: An institute for innovation in automatic decision making in cooperation with workers, which shall explore and prototype intelligent systems with various axes of worker control (i.e. ranging from 'systems designed along worker-friendly principles' to 'responsive to real-time worker input' to 'explicitly incorporating cooperative decision mechanisms for key decisions').
    - It shall partner with existing organisations, in particular cooperatives (platform and otherwise), to apply and test systems under real-world conditions.
    - It shall assess outcomes with particular attention to humanistic goals, quality of life and environmental sustainability, and worker-centered perspectives, emphasising the dignity and autonomy of workers.
    - It shall require particular attention to barriers faced by marginalised workers and workers from traditionally excluded backgrounds.
- **Technology for Democratic Processes:** An institute to explore how technological tools can support democratic processes and citizen participation, for example assessing the potential of various digital voting platforms.

- **Sustainable Technologies**: An institute for innovation around sustainable and widely accessible technologies for a fast and just ecological transformation.

4.3. And What Would the World Feel Like?

Diane, 29, Estonia

Diane is a junior developer with a considerable skill set. After she landed some newbie gigs with bigger transnational companies she felt both overworked and under-challenged, so she decided to join a bunch of developers who have committed to working toward a green transition. Her job was to develop an app for people that buy and sell home-generated-electricity – cooperatives similar to Paul's, in Berlin.

After a short while she realised that this is not a mission which attracts a lot of start-up capital, as it was not the principal aim of the app to generate quick revenue. Luckily she discovered an EU funding scheme for research and innovation that was deliberately aimed at civil society organisations, non-profit technology projects and cooperatives with a clear mission of green and social change. The funding helped her to develop the app and a sustainable business model that provides enough money for the three developers that now maintain and further develop the app.

The app is – of course – licensed under a Free and Open Software license so other cooperative can tailor it to their needs. Or have Diane and her team do it for them.

5. Approval and Review Process

5.1. Approval Process

This is the 2019 version of DiEM25's Technological Sovereignty Green Paper. It will be subject to a vote of approval of the whole membership. Once approved, it will officially be published as a White Paper and becomes part of DiEM25's Progressive Agenda for Europe.

5.2. Review Process

Technology changes rapidly today. In addition, DiEM25 is aware that, while we have endeavoured to cover as many fields of technology as possible, this paper has its main focus on Information Technology. Many other technologies (health and biotech related, new materials, energy, space and aviation, defense, CRISPR and other aspects of genetic technology, GMOs, IoT, VR/AR, Cybersecurity and encryption, and many others) merit attention as well. However, many policies in chapter 2 and chapter 3 address structures, such as innovation funding, that can apply across most technological domains. The focus on Information Technology does make sense, however, from the observation that "information" and the way it is handled, are key to any political system.

While Annex 1 provides guiding principles on how more specific answers in any field of technology can be formulated on the basis of this paper, it may not be sufficient. To address these two challenges – rapidly changing technology, and the inevitable need to address additional topics and perspectives – DiEM25 will carry out regular reviews of this paper.

The review will be on an annual basis, unless there is a meaningful event or request from the membership to speed up that process.

The review process will be lead by the Technological Sovereignty 1 DSC, and will take place annually in spring. It will consist of the publication of a questionnaire to the membership, asking for meaningful input in terms of modifications or new developments. If a discovery or scientific development makes any of the proposals substantially obsolete or contrary to our goals (for example, if cryptography is broken, or some equally cataclysmic event), it will be amended – corrected as soon as possible.

Based on the input received, an editing team will suggest modifications, updates or new additions to the Paper, and the updated version will be subject to a new vote of the membership. Depending on the complexity of the material received, this process may happen in one or two iterations, and additional feedback of the membership may be asked.

If no sufficient material changes are suggested, it is possible that no update is provided, in which case the previous version remains applicable.

This process will be done in a transparent manner; all steps of the process will be shared with the membership, and a procedure will be set up to ensure that, in case of disagreements, a transparent and open decision process will be used.

6. Annex 1: DiEM25 Guiding Principles on Technology Policy

1. Technology serves humanity, not the other way around.

What does that mean?

Technological development is not a goal in itself. Technology exists to serve human progress. When technology harms humanity, it should be regulated, restricted, or even banned. And all aspects of humanity, such as welfare, health, ease of use, values, and social relationships of all humans have to be taken into account.

DiEM25 firmly supports human rights in the face of technology – humans, all humans, come first, and technology second.

2. Technology can be awesome.

What does that mean?

Technological development can be a formidable force for good. Technology is a key contributor to our civilisation's ability to provide health, welfare, social interaction, freedom, safety and happiness. Technology allows for the increases in productivity enabling human progress.

DiEM25 firmly supports sound and positive technological development that benefits mankind, and rejects Luddite anti-technological thinking.

3. There is always a choice.

What does that mean?

Every technological development is the result of choices. Choices made by governments, investors, consumers, manufacturers, distributors and many others. No technology is god-given or invisible hand-given. No technology is unavoidable or un-opposable.

DiEM25 believes that, as a society, we have the duty to be aware of the fact that we make choices on technology. Choices on technical standards. On interoperability. On ownership and use of technology. On control and regulation of technology. Those choices, and the debate around them, must become visible to the public eye, and exposed on the public platform.

DiEM25 firmly supports democracy and rejects technocracy.

4. There is no such thing as a free lunch.

What does that mean?

Everything comes at a cost. Also technology. There are at least three inherent costs of technology. The first cost is that every technology requires initial investment. When that investment comes from the state or another collective body, it must be recognised and rewarded. The second cost is that, by selecting or benefitting one technology over another, someone always loses out. It is a hidden cost, paid by the beneficiaries of the technology we choose not to develop. The third is the cost related to creating and using a technology. From pollution to traffic victims, many people pay a heavy price for technology.

DiEM25 wants society to recognise the costs of technology to society, in addition to its benefits. Then, both costs and benefits need to be properly allocated and/or compensated.

5. Value is in sharing

What does that mean?

Technology is the result of value creation, and, in turn, enables the creation of more value. But value does not stand by itself. Value exists in relation to other things, and to people. Artificial boundaries that block or slow down the creative sharing of technology damage society. The more value and technology are shared, the more

they can create value in return. By sharing technology and knowledge, society ensures that much more value is created than by "protecting" it.

DiEM25 firmly supports sharing technology, and rejects monopolies or rent seeking.

6. There is no natural distribution of the proceeds of technology

What does that mean?

The "invisible hand" is a dogma, and it does not actually exist. The proceeds of technology originate from the whole of society – no inventor is an island. Sharing the proceeds of technology across society is a matter of essential fairness. This is because non-regulated systems are structurally incapable of providing a fair and just distribution of the proceeds of technology. Therefore, we must establish rules on how the proceeds of technological process benefit all different parts of society. That is a quintessential democratic process: the clash of different interest groups must be done openly, through debate, with enforceable rules of engagement.

DiEM25 strongly believes that the decision on allocation of the proceeds of technological development must be openly and democratically discussed. DiEM25 firmly rejects the dogma of the invisible hand.

7. We stand on the shoulders of giants

What does that mean?

Technology does not fall from the sky. For tens of thousands of years, humans have made incremental progress in developing technology. It is the result of collaboration and co-operation between many. The knowledge handed down from our ancestors is absolutely necessary for us to build on it. And just like we borrowed that knowledge from our ancestors, we need to pass it on to the next generations.

DiEM25 rejects artificial boundaries around knowledge, and wants to ensure that continued progress remains possible through the sharing of both old and new knowledge.

8. No-Frankenstein-principle

What does that mean?

Our society is becoming ever more complex, as is our technology. 50 years ago, a well-trained engineer could understand, and repair, a lot of technology. That is no longer the case. With hyper-specialisation comes hyper-mutual dependency. Sometimes we don't fully understand the technology we create. Therefore, the myth of the sole genius (e.g. Dr. Frankenstein) solving a fundamental problem in his (never, by the way, "her") basement is no longer useful – quite the opposite. The ever-increased specialisation and complexity of technology makes it necessary for our society to open up as much information as possible about how things work – so we are able to understand what goes wrong when something goes wrong. As it inevitably will.

DiEM25 rejects the Frankenstein myth as a workable basis for developing and maintaining knowledge and innovation. An ever more complex and specialised society and technology demands as much open knowledge and communication as possible.

9. Technology reflects our values

What does that mean?

Technology is never value-free. The way we fund, adopt, use and regulate technology, or not, reflects society's choice of its values and priorities. E.g. we currently accept that thousands of children are killed every year through society's incoherent approach to the use of transportation technology. That is a reflection of our society's priorities and values. We must be more aware of how choices around technology must be rooted in values, and openly discuss and decide on them in a democratic way. The agenda setting of the debate around technology and values should be open, and not set by the technology industry itself.

DiEM25 strongly supports open and healthy discussions on the values that are reflected through our choices around technology, and firmly rejects the notion of value-free technology. Negative values such as corruption, fraud or privilege are not acceptable, and technology may not be used to defend or strengthen them

10. Technology solves technical problems, not human ones

What does that mean?

Technological messianism is not the right approach. Technology is a tool that can help to solve technical problems. But it is humans who must direct how technology is used, and its purpose must be to solve human problems and the problems of all lifeforms that humans are responsible for. Justice, equality, fairness, or the lack thereof, will not be solved by technology alone. Without human and moral guidance, technology has as much opportunity to make problems worse as to make them better. Already, we see how prejudice and bias can be strengthened through technology, making technology part of the problem, rather than the solution. In the end, technology is and remains a tool. And we must choose how to use it.

DiEM25 believes that technology must be used as a tool to address problems of human society, and firmly rejects technological messianism.