TEXTE
35/2025

Report 1

Digitalisation and sustainability in the context of Germany's Presidency of the Council of the European Union 2020

Analysis report of the project "Digitalisation and sustainability at EU level: Opportunities and risks of digitalisation for the implementation of the 2030 Agenda at EU level"

by:

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Abstract: Digitalisation and sustainability in the context of Germany's Presidency of the Council of the European Union 2020

This report analyses the role of Germany's Presidency of the Council of the European Union, which took place from 1 July until 31 December 2020, concerning the topics of digitalisation and sustainability. A document analysis of press releases, articles, and speeches as well as relevant background reports published during the German Council Presidency revealed that the discourse on digitalisation and sustainability revolved around three nexuses: 1. "Sustainable digitalisation", 2. "Digitalisation for sustainability", and 3. "Digitalisation and sustainability in silos". Discussions focused primarily on four areas: environment, transport and mobility, digital economy, and recovery. Based on the results of the analysis, we first suggest future priorities in these areas. Second, additional potential future priority areas are discussed, namely circular economy, energy systems, housing, and biodiversity. Third, we propose additional perspectives that might be relevant for future debates. Finally, we analyse the interlinkages between digitalisation and sustainability within the policy documents and how additional policy frameworks can be fruitfully included in future debates.

Kurzbeschreibung: Digitalisierung und Nachhaltigkeit im Kontext der deutschen Präsidentschaft im Rat der Europäischen Union 2020

Der vorliegende Bericht analysiert die Rolle der deutschen Ratspräsidentschaft, die vom 1. Juli bis zum 31. Dezember 2020 stattfand, in Bezug auf die Themen Digitalisierung und Nachhaltigkeit. Eine Inhaltsanalyse von Pressemitteilungen, Artikeln und Reden sowie relevanten Hintergrundberichten, die während der deutschen Ratspräsidentschaft veröffentlicht wurden, zeigt, dass sich der Diskurs über Digitalisierung und Nachhaltigkeit um drei Nexus drehte: 1. "Nachhaltige Digitalisierung", 2. "Digitalisierung für Nachhaltigkeit" und 3. "Digitalisierung und Nachhaltigkeit in Silos". Der Diskurs konzentrierte sich vor allem auf vier Kontexte: Umwelt, Verkehr und Mobilität, digitale Wirtschaft und wirtschaftliche Erholung. Basierend auf den Ergebnissen der Analyse werden erstens zukünftige Prioritäten in diesen analysierten Kontexten vorgeschlagen. Zweitens werden potenzielle zusätzliche künftige Prioritäten in den Bereichen Kreislaufwirtschaft, Energiesysteme, Wohnungsbau und Biodiversität erörtert. Drittens schlagen wir zusätzliche Perspektiven/Nexus vor, die für zukünftige Debatten relevant sein könnten. Abschließend wird analysiert, mit welchen politischen Strategien die Debatten über Digitalisierung und Nachhaltigkeit verknüpft wurden und welche zusätzlichen politischen Initiativen sinnvollerweise in zukünftige Debatten miteinbezogen werden sollten.

Table of content

List of tables

List of abbreviations

Abbreviation	Explanation
AI	Artificial intelligence
BMUV	German Federal Ministry for the Environment, Nature Conservation and Nuclear Safety and Consumer Protection
DMA	Digital Markets Act
DSA	Digital Services Act
CE	Circular economy
CEAP	Circular Economy Action Plan
EC	European Commission
EGD	European Green Deal
EPC	European Policy Centre
EU	European Union
GHG	Greenhouse gas
ICT	Information and communications technologies
UBA	German Environment Agency (Umweltbundesamt)

Summary

This report analyses the role of Germany's Presidency of the Council of the European Union – hereinafter German Council Presidency – regarding topics related to digitalisation and sustainability. To this end, we conducted a document analysis using quantitative and qualitative approaches. We investigated 47 press releases, articles, and speeches published during the German Council Presidency, which took place from the 1 July 2020 until the 31 December 2020. Furthermore, we included nine background reports in the analysis that gave additional context information to the examination.

Major findings from the document analysis are:

- The debates during the German Council Presidency can be grouped into three nexuses: 1. "Sustainable digitalisation", 2. "Digitalisation for sustainability" and 3. "Digitalisation and sustainability in silos".
- These nexuses between digitalisation and sustainability have been discussed within nine context areas: recovery, consumer protection, digital economy, industry, food industry, transport and mobility, environment, inclusion, and international cooperation.
- From these nine areas, four of them have gained particular attention in the debates: environment, transport and mobility, digital economy, and recovery.
  - Area 1 – **Environment**: Discussions in this area dealt with both Nexus I and Nexus II – how to make digitalisation more environmentally sustainable and how digitalisation can be used for environmental sustainability. The discussion on sustainable digitalisation covered only some of the topics within this area. Topics were the sustainability of data centres and AI applications as well as reducing the number of discarded ICT products.
  - Area 2 – **Transport and mobility**: The documents regarding the area of mobility and transport revealed the most concrete policy initiatives started by the German Council Presidency: the Passau Declaration and the New Mobility Approach. The strategies in these initiatives aim to stimulate research in automation in order to allow for the expansion of charging infrastructure for alternative fuels and shift freight transport from road to rail. The expansion of area-wide electricity grids and high-performance data networks is aimed at facilitating digital communication and working from home – also post-pandemic – thus avoiding emissions in passenger transport.
  - Area 3 – **Digital Economy**: Within the context of the digital economy, the focus was put on making digitalisation more sustainable (Nexus I). Three interlinked issues have been stressed during the German Council Presidency: Fair taxation and fair competition as well as securing the EU's digital sovereignty are key to reaching (economic) sustainability within the digital economy. Regarding fair taxation, the Council of the European Union – hereinafter Council – confirmed the need for new European Union (EU) rules on the exchange of information on revenue generated on digital platforms and the exchange of tax-relevant data for crypto-assets and e-money. It also emphasised the need for a digital levy brought forward by the European Commission (EC). With regard to fair competition, the Council promoted the DSA (Digital Services Act) and the DMA (Digital Markets Act). The German Council Presidency stressed the importance of initiatives like GAIA-X for establishing a European Data Infrastructure to counterbalance online platforms with significant power but also for enabling digital sovereignty in terms of infrastructure and data pools.

- Area 4 – **Recovery**: Within the analysed documents, it is repeatedly stressed that while the EU's recovery efforts necessarily are a central priority, they shall be implemented in a way that supports, rather than undermines the goals of reaching a twin digital and sustainable transition.

Next, we compared the discussions on digitalisation and sustainability within the German Council Presidency with other discussions in science, politics, and civil society. As a result, we developed several possible future priorities to be addressed within the EU.

Future priorities are to

- address **additional issues** in areas that already received high attention:
  - Environment: Longevity of devices by design and the development of respective incentives and business models for refurbishment, right to repair, standardisation, higher recycling rates, data intensity of software, the efficiency of networks, and data sufficiency.
  - Transport and mobility: Shift passenger transport from road to rail with the help of digital tools; use digital tools to reduce passenger transport.
  - Digital Economy: Integrate the perspective of environmental sustainability into debates on and regulatory approaches for the digital economy.
  - Recovery: Tie funding for recovery activities to initiatives that combine the promotion of digitalisation and environmental sustainability.
- include **additional areas**:
  - Circular Economy (CE): While this aspect was mentioned during the German Council Presidency, the role of digitalisation in achieving a CE stayed general and vague. A future priority of the German Federal Government could be to identify the role of digitalisation in collecting data and providing information for circular production methods and circular business models. The main policy approach at the EU level in this area is the Ecodesign Directive. Its scope should be enlarged by including circular aspects and by focussing on products with a direct connection to digitalisation.
  - Energy systems: Focus on the role of digitalisation for transforming energy systems towards renewable energy.
  - Housing: Address the ambivalent environmental effects of smart homes.
  - Biodiversity: Strengthen the focus on the role of digitalisation to secure biodiversity.
- introduce **additional overall perspectives** regarding digitalisation and sustainability:
  - Introduce sufficiency measures as response to environmental risks such as rebound effects.
  - Foster system innovations rather than perpetuating existing unsustainable economic subsystems.
- **integrate sustainability goals into additional policy frameworks** that are so far focused on the digital economy, such as the European Digital Strategy, the DSA, the DMA and the Artificial Intelligence Act.

Zusammenfassung

Im vorliegenden Bericht wird die Rolle der deutschen Präsidentschaft im Rat der Europäischen Union in Bezug auf die Themen Digitalisierung und Nachhaltigkeit analysiert. Zu diesem Zweck wurde eine quantitative und qualitative Dokumentenanalyse durchgeführt. Untersucht wurden 47 Pressemitteilungen, Artikel und Reden, die im Zuge der deutschen Ratspräsidentschaft vom 1. Juli bis zum 31. Dezember 2020 veröffentlicht wurden. Darüber hinaus wurden neun Hintergrundberichte in die Analyse einbezogen, die zusätzliche Informationen zu besonders relevanten Themenbereichen lieferten. Diese Themenbereiche wurden durch die Analyse der Dokumente identifiziert.

Die zentralen Ergebnisse der Dokumentenanalyse sind:

- Die während der deutschen Ratspräsidentschaft geführten Debatten lassen sich in drei Nexus einteilen: 1. „Nachhaltige Digitalisierung", 2. „Digitalisierung für Nachhaltigkeit", und 3. „Digitalisierung und Nachhaltigkeit in Silos".
- Die Verknüpfungen zwischen Digitalisierung und Nachhaltigkeit wurden in neun Kontexten diskutiert: wirtschaftlicher Aufschwung, Verbraucherschutz, digitale Wirtschaft, Industrie, Lebensmittelindustrie, Verkehr und Mobilität, Umwelt, Inklusion und internationale Zusammenarbeit.
- Vier dieser neun Kontexte stachen in der Debatte besonders hervor: Umwelt, Verkehr und Mobilität, digitale Wirtschaft und wirtschaftliche Erholung.
    - Kontext 1 – **Umwelt**: Der Diskurs in diesem Kontext drehte sich sowohl um Nexus I als auch Nexus II, sprich darum wie die Digitalisierung umweltverträglicher gestaltet werden kann und, dass die Digitalisierung für ökologisch nachhaltigeres Wirtschaften genutzt werden sollte. Dieser während der deutschen Ratspräsidentschaft geführte Diskurs zu nachhaltiger Digitalisierung deckte sich allerdings nur teilweise mit bestehenden Debatten in diesem Feld. Konkret diskutierte Themen waren die Nachhaltigkeit von Rechenzentren und KI-Anwendungen sowie die Verringerung der Anzahl ausrangierter IKT-Produkte.
    - Kontext 2 – **Verkehr und Mobilität**: In den Dokumenten zum Kontext Verkehr und Mobilität konnten die konkretesten politischen Initiativen der deutschen Ratspräsidentschaft identifiziert werden: die Passauer Deklaration und der New Mobility Approach. Diese Initiativen beinhalten Maßnahmen zur Förderung von Forschungsvorhaben im Bereich der Automatisierung, zum Ausbau der Ladeinfrastruktur für alternative Kraftstoffe und die Verlagerung des Güterverkehrs von den Straßen auf die Schienen. Der Ausbau flächendeckender Stromnetze und leistungsfähiger Datennetze soll die digitale Kommunikation und das Arbeiten von zu Hause aus - auch nach der Pandemie - ermöglichen und damit Emissionen im Personenverkehr vermeiden.
    - Kontext 3 – **Digitale Wirtschaft**: Im Kontext der digitalen Wirtschaft wurde der Fokus auf eine nachhaltigere Gestaltung der Digitalisierung gelegt (Nexus I). Während der deutschen Ratspräsidentschaft wurden drei miteinander verknüpfte Themenschwerpunkte betont: Faire Besteuerung und fairer Wettbewerb sowie die Sicherung der digitalen Souveränität der EU sind der Schlüssel zur Erreichung der (wirtschaftlichen) Nachhaltigkeit in der digitalen Wirtschaft. Im Hinblick auf eine faire Besteuerung betonte der Rat die Notwendigkeit neuer EU-Vorschriften für den

Austausch von Informationen über die auf digitalen Plattformen erzielten Umsätze und den Austausch steuerrelevanter Daten für Krypto-Assets und E-Geld. Der Rat betonte außerdem die Notwendigkeit einer von der Europäischen Kommission vorgeschlagenen Digitalsteuer. Im Hinblick auf einen fairen Wettbewerb warb der Rat für den DSA und den DMA. Die deutsche Ratspräsidentschaft betonte die Bedeutung von Initiativen wie GAIA-X für den Aufbau einer europäischen Dateninfrastruktur, um ein Gegengewicht zu großen Online-Plattformen mit erheblicher Vermittlungsmacht zu schaffen, aber auch um digitale Souveränität in Bezug auf Infrastruktur und Datenpools zu ermöglichen.

- Kontext 4 – **wirtschaftlicher Aufschwung**: In den analysierten Dokumenten wurde wiederholt betont, dass die Bemühungen der EU um den wirtschaftlichen Wiederaufbau zwar zwangsläufig eine zentrale Priorität darstellen, dies aber so umgesetzt werden sollte, dass die übergeordneten Ziele der „green and digital transition" unterstützt und nicht vernachlässigt oder untergraben werden.

Anschließend wurden die Schwerpunkte des Digitalisierungs- und Nachhaltigkeitsdiskurses innerhalb der deutschen Ratspräsidentschaft mit anderen Diskursen zu diesen Themen in Wissenschaft, Politik und Zivilgesellschaft verglichen. Auf diese Weise konnten mehrere potenzielle zukünftige Prioritäten, die auf EU-Ebene angegangen werden sollten, entwickelt werden.

Diese zukünftigen Prioritäten sind:

- Weitere **konkrete Themen** in jenen Kontexten ansprechen, die bereits hohe Aufmerksamkeit erlangt haben:
  - Umwelt: Langlebigkeit von Geräten durch Design und die Entwicklung entsprechender Anreize und Geschäftsmodelle für die Wiederaufbereitung, das Recht auf Reparatur, Standardisierung, höhere Recyclingraten, Datenintensität von Software, Effizienz von Netzwerken, Datensuffizienz.
  - Verkehr und Mobilität: Verlagerung des Personenverkehrs von den Straßen auf die Schienen mit Hilfe digitaler Lösungen; Nutzung digitaler Lösungen zur Reduzierung des Personenverkehrs.
  - Digitale Wirtschaft: Einbeziehung der Perspektive der ökologischen Nachhaltigkeit in die Debatten über und Regulierungsansätze für die digitale Wirtschaft.
  - Wirtschaftliche Erholung: Kopplung der Finanzierung von Konjunkturmaßnahmen an die Bedingung, dass Förderung der Digitalisierung und der ökologischen Nachhaltigkeit miteinander verbunden werden.
- Die **Einbeziehung zusätzlicher Kontexte**:
  - Kreislaufwirtschaft: Obwohl dieser Themenkomplex während der deutschen Ratspräsidentschaft erwähnt wurde, blieb die Rolle der Digitalisierung bei der Realisierung einer Kreislaufwirtschaft eher allgemein und vage. Ein zukünftiger Schwerpunkt könnte die Rolle der Digitalisierung bei der Sammlung und Bereitstellung der notwendigen Informationen für zirkuläre Produktionsmethoden und Geschäftsmodelle sein. Die wichtigste politische Initiative auf EU-Ebene in diesem Bereich ist die Ökodesign-Richtlinie. Ihr Anwendungsbereich sollte durch die Einbeziehung von Kreislaufaspekten und die Konzentration auf Produkte mit einem inhärenten Bezug zur Digitalisierung erweitert werden.

- Energiesysteme: Fokussierung auf die Rolle der Digitalisierung in der Energiewende.
- Wohnen: Auseinandersetzung mit den ambivalenten Umweltauswirkungen von Smart Homes.
- Biodiversität: Stärkerer Fokus auf die Rolle der Digitalisierung zum Biodiversitätserhalt.

► **Weitere übergreifende Perspektiven/Nexusarten** zu Digitalisierung und Nachhaltigkeit einführen:

- Suffizienzmaßnahmen als Antwort auf Umweltrisiken wie beispielsweise Rebound-Effekte einführen.
- Förderung von Systeminnovation anstatt der Fortsetzung bestehender nicht nachhaltiger wirtschaftlicher Subsysteme.

► **Nachhaltigkeitsziele in weitere politische Rahmenwerke zu integrieren**, die sich bisher auf die digitale Wirtschaft konzentrieren, wie z. B. die European Digital Strategy, den DSA, den DMA oder den Artificial Intelligence Act.

1 Introduction

European economies are currently facing a three-fold challenge. First, environmental crises – with climate change highest on the political agenda – are demanding a rapid transformation of production and consumption, including all economic sectors. Second, the economic recession following the COVID-19 pandemic has aggravated many social problems such as rising unemployment and poverty rates as well as exacerbating social inequalities (Grasso et al. 2021; Ksinan Jiskrova et al. 2021; Su et al. 2021). Third, digitalisation transforms economic processes – again encompassing all economic sectors. The three challenges of environmental transformation, COVID-19 recovery, and digital transformation need to be analysed and responded to facilitate a transformation of European economies for the decades to come.

1.1 Environmental effects of digitalisation

The application of digital technologies has been ascribed large potentials to help solving environmental problems, especially GHG (greenhouse gas) emissions, biodiversity loss, soil erosion, and others. Due to the heterogeneity of technologies related to digitalisation and economic sectors they are applied to, these potentials take very different forms. However, most applications have in common that economic activities are supposed to become more efficient due to the application of digital technologies. Precision farming can reduce the number of fertilisers and pesticides needed per unit of food production. Optimised industrial production using digital tools can decrease energy and resources needed. The list of actual and potential applications of digitalisation to increase efficiencies is countless. In addition, digital tools can be used to facilitate system transformations of economic sectors. Most importantly, information and communications technologies (ICT) are needed for a renewable energy system.

However, digitalisation has not lived up to these ascribed potentials in the past. In fact, results so far have been mixed. Cross-country studies show that digitalisation goes along with higher levels of energy consumption (Lange et al. 2020; Schulte et al. 2016) as well as GHG emissions (Salahuddin et al. 2016). One reason is the substantial level of energy and resource consumption by the ICT sector itself. This has lately been estimated to account for between 2.1-3.9% of total global GHG emissions (Freitag et al. 2020). This is due to the increasing number of digital devices, computationally intensive software, and the expansion of physical infrastructure such as server capacities. A second reason is that digitalisation often induces additional usage or consumption not only of digital devices and services but other goods and services as well. So-called rebound effects describe how the increased efficiency that digital applications can achieve induces consumption of goods and services and therefore, also energy and GHG emissions (Coroama and Mattern 2019; Lange and Santarius 2020).

1.2 Debates on digitalisation and sustainability at the EU level

Regarding the positive and negative environmental effects of digitalisation, perspectives at the EU level take into account the potentials of digitalisation as well as the necessity to make the ICT sector more sustainable. Under the term "ICT for Green" or "ICT for sustainability" many reports and policy papers by the EC, along with the Council's conclusions, argue for potentials of digitalisation to reduce environmental pressures throughout economic sectors such as the energy system, agriculture, industrial production, mobility, and housing (Council of the European Union 2020; EC 2020, 2021a, 2021b; EP 2021). A particularly important debate is taking place on circularity: A paradigm shift from a linear to a CE by rethinking and redirecting current production and consumption patterns. This means that the challenge of circularity must

be considered throughout the supply chain. Digitalisation is supposed to play a key role in this shift.

Proposals and debates at the EU level have also taken up the perspective of an increasing challenge of the energy and resource consumption of the ICT sector itself. The terms "Green ICT" or "Sustainable ICT" include strategies to supply the electricity demanded by digitalisation from renewable energy sources, the durability of devices to be increased, recycle rates to be fostered, etc. (Hilty et al. 2011). At the EU level, a key approach is the Ecodesign Directive.

The perspective of rebound effects and other mechanisms via which digitalisation induces higher energy and resource consumption are not at the forefront of discussions at the EU level. On a national level, the "Digital Policy Agenda for the Environment" of the BMUV recognises and strives to minimise rebound effects (BMUV 2020). How exactly this is to be achieved, however, remains a challenge.

Based on this agenda at the national level, the German government started with the goal to push forward the topic of digitalisation and sustainability in its Council Presidency. In the summer of 2020, the European Policy Centre published the report "Towards a green and resilient EU economy: How can digitalisation help?" (Hedberg and Šipka 2020a). It was based on a longer background paper for the German Council Presidency (Hedberg and Šipka 2020b). Their analysis focussed on the potentials of digitalisation in five areas: biodiversity, agriculture, mobility, industry/CE, and greening ICT. The potentials of digitalisation to improve these areas were connected to nine important policy areas at the EU level: The EGD (European Green Deal), a European data space, the digital agenda, biodiversity, agriculture, mobility, CE, the industrial agenda, and EU funding. It was a key input into the German Council Presidency.

The high relevance of the relation between digitalisation and sustainability is also indicated by its prominence for the BMUV. An "environmentally and climate-friendly digitalisation" is put forward as one of three major goals for the German Council Presidency, next to "climate action" and "biodiversity". In addition, two other priorities are named: "a resource-efficient and low-emission economy" and "a framework for EU environmental policy for the coming decade" (BMUV n.d.).

Based on this high relevance attributed to it, the present paper takes an ex-post perspective on the German Council Presidency and analyses what has been discussed during the presidency. Thereby, our analysis lays the foundations for promising future policy initiatives in the Council.

1.3 Purpose and outline of this paper

Germany held the Presidency of the Council of the European Union from the 1st of July to the 31st of December 2020. This analysis paper investigates its role with regard to digitalisation and sustainability. The purpose of the analysis is to deliver an empirical base upon which (strategic) fields of action in digitalisation and sustainability can be prioritised beyond the course set by the German Council Presidency.

We focus the analysis on two aspects. First, we investigate how the relations between digitalisation and sustainability are depicted – we call these the nexus types. Second, we examine within what types of discussions on digitalisation and sustainability take place and what types of topics are discussed within the identified areas. The investigation is based on a document analysis of press releases, articles, and speeches published during the German Council Presidency.

The remainder of the paper is structured as follows: Section 2 describes the methodology. Section 3 presents the results regarding the three nexus types identified and the areas in which

they were discussed. In section 4, we discuss which nexus types and topics within these areas have received significant attention – and in turn, which additional aspects could be prioritised.

2 Methodology

We conducted a document analysis using quantitative and qualitative approaches. We investigated press releases, articles, and speeches that have been published during the German Council Presidency, which took place from the 1st of July until the 31st of December 2020. Furthermore, we included background reports in the analysis that provided additional information for the analysis. Table 1 provides an overview of the different document sources and the number of documents selected for the final analysis.

Table 1: Sources of material selection and number of selected documents

Type of document	Source	Number of documents selected for final analysis
Press releases from the German government	https://www.eu2020.de/eu2020-en/news/pressemitteilungen	5
Press releases from the Council	https://www.consilium.europa.eu/en/press/press-releases/	11
Articles	https://www.eu2020.de/eu2020-en/news/article	30
Speeches	https://www.eu2020.de/eu2020-en/news/reden	1
Background reports	https://www.consilium.europa.eu/en/policies/	9
Total		**56**

The document selection took place in a two-step process. The first step involved the selection of press releases, articles, and speeches. The second step included the selection of additional background reports in consultation with the German Environment Agency (UBA). We divided this process into two phases, as the background reports had the function of providing additional information for the analysis rather than forming its basis. With the help of the categories formed after the first stage, we were able to identify the background reports relevant for our analysis.

Criteria for selecting press releases, articles, and speeches were as follows: Documents were chosen that were published between the 1st of July and the 31st of December 2020 and address issues of digitalisation and sustainability. To that end, the filtering functions of the respective websites listed in Table 1 were used to filter documents that included the following keywords: "Sustainability", "Sustainable", "Environment", "Digitalisation" and "Digitisation". Verification of whether the documents were published in the time period was done manually for the press releases from the German Federal Government, articles, and speeches. For press releases from the Council, an available filter for time periods was applied. Only those press releases were selected that had a "Council of the EU" tag.

Table 2 shows the number of press releases, articles, and speeches found in each of the areas of sustainability and digitalisation. In order to identify those documents that address both digitalisation and sustainability issues, we conducted a full-text keyword search. The second line of Table 2 shows the keywords used to search for the documents. In total, we identified 87 documents in which interlinkages between digitalisation and sustainability were dealt with. Appendix A gives an overview of these documents.

Table 2: Number of press releases, articles and speeches found in the areas of digitalisation and sustainability

	Digitalisation	Sustainability	Digitalisation and Sustainability
Number of press releases, articles, and speeches	66	180	87
Keywords used to search identify intersections [1]	*sustain*, environment, natur*, ecosystem, biodiversity, climate, energy, agricultur*, fish*, housing, mobility, transport, food, building*	digi*, data, hardware, software, device, technolog*	Documents including keywords of both topics – digitalisation and sustainability

For a better overview of the corpus of material and to be able to select documents for an in-depth analysis, we inductively formed categories along two dimensions.

- The first dimension refers to nexus types, i.e., characterisations of the respective interlinkages between digitalisation and sustainability within the selected documents. We drew on common distinctions of these interlinkages within existing discourses on digitalisation and sustainability and developed a new type i.e. digitalisation and sustainability in two silos (see section 3.1).
- The second dimension refers to the areas, i.e., in what kind of topics the issues around digitalisation and sustainability were dealt with (see section 3.2). The area categories were developed in an iterative process in which clusters of thematically similar texts were grouped or delineated from one another. For each document, we assigned one nexus type and one area category, thereby focusing on the nexus type and area category that appears dominantly in the documents.

The nexus types and area categories are described in more detail in section 3.

Once the categories along these two dimensions were formed, we selected those area categories for further analysis, which received attention in the highest number of press releases, articles, and speeches. We identified four area categories for in-depth analysis (see 3.2). We then consulted with the UBA to identify what types of background reports should be included in the analysis. Out of the 34 policy topics, we agreed to include background reports from the following topics: Digital Europe, Energy, EU Construction Plan, Research and Technological Development, Climate Neutrality, Agriculture, Telecommunications, Environment, Enterprise and Industry, Consumer Protection, Transport, Economy and Finance. Furthermore, we agreed to include information from the following policy topics with a lower priority: Taxation, Health, Social Affairs, Employment, Single Market, Youth, and Regional Development.

We retrieved the background reports on the selected policy topics and assigned them to the previously developed area categories and nexus types. Table 3 shows that only half out of the 46 retrieved background reports addressed the intersection of digitalisation and sustainability and

[1] The asterisk (*) indicates that alternative endings of the terms were taken into account (e.g., 'sustainability' and 'sustainable'). We manually sorted out documents if they were not related to digitalization or sustainability respectively.

were therefore potentially relevant for our analysis. Finally, only those reports were selected that were assigned to one of the four area categories previously identified relevant for the in-depth analysis. An overview of the documents selected for the final analysis as well as the abbreviation assigned to each document is provided in Appendix B. An overview of the additionally consulted background reports is provided in Appendix C.

The following questions guided the analysis:

- Which goals and challenges as well as approaches were discussed at the interface of digitalisation and sustainability during the German Council Presidency?
- Which relevant strategies and initiatives at the EU level concerning digitalisation and sustainability can be identified?
- In which arenas is the interface of digitalisation and sustainability discussed and which actors pursue which agendas?

As shown above, the document analysis is limited both in terms of the time period considered and the type of documents included. It is a snapshot that, due to the types of documents analysed, is predominantly based on the perspective of the German government. These limitations should be taken into account when considering the main results, which are provided in the next chapter.

3 Results of the analysis

Regarding the question, which topics at the nexus of digitalisation and sustainability have been prioritised during the German Council Presidency, the document analysis has revealed three different nexus types of digitalisation and sustainability.

3.1 Three nexus types

3.1.1 Nexus 1: Sustainable digitalisation

The **first nexus type** deals with the challenges related to **making digitalisation more sustainable**. On the one hand, this refers to reducing the resource and energy consumption of the ICT sector, i.e., Green ICT. The following text segment illustrates this aspect:

> "The Environment Council is calling on the Commission, (…) to improve product durability. To this end, the Commission is to develop new ecodesign criteria and propose information requirements to ensure that consumers can repair products more easily in future. In particular, this will affect IT and electrical equipment such as smartphones, tablets and household appliances" (PM_BR08).

On the other hand, this nexus also covers statements on making the digital economy fair and socially just, e.g., by facilitating access to digital markets, limiting market power of digital platforms, reducing digital divides, taxing digital companies fairly, or protecting consumer rights. One typical text segment covering this aspect is the following:

> "All corporations should pay their fair share of taxes, including corporations in the digital economy. This is a question of justice and fair competition" (PM_RAT35).

3.1.2 Nexus 2: Digitalisation for sustainability

The **second type of nexus** focuses on the use of **digital tools and solutions to achieve sustainability goals in various fields of action** such as mobility, energy, or production. Mostly the goals refer to lowering environmental pressures within these fields, e.g., by reducing energy consumption and related GHG emissions or increasing resource efficiency. The following text segment illustrates the environmental aspect of this nexus:

> "A smart parking solution displaying free parking spaces on an appropriate platform could help avoid around one million tonnes of CO2 annually" (A07).

However, within the analysed documents, the digital transformation is also described to function as an enabler with respect to social or economic sustainability goals, e.g., by creating jobs in the digital economy or fostering the EU's economic competitiveness. The following text segment illustrates this:

> "The growing number of industrial data our society produces will foster the development of artificial intelligence tools and contribute to new health, mobility or environmental policies - with a significant job creation potential" (A25).

3.1.3 Nexus 3: Digitalisation and sustainability in silos

The document analysis also revealed that digitalisation and sustainability are often mentioned in the same breath, indicating that both transitions should be brought together without, however, elaborating on how this could be achieved. The **third type of nexus** brings together **digitalisation and sustainability only loosely**, stating that both are important goals. How

these two transformation processes interact remains unclear. The following text segment illustrates this nexus:

> "EU funding will be geared towards new and reinforced priorities across the EU's policy areas, including green and digital transitions" (PM_RAT15).

As this nexus does bring together digitalisation and sustainability but hardly deals with the actual quality of the connection between both, it describes these two topics technically speaking rather as two silos.

3.1.4 Comparing the three nexus types

When comparing these three nexus types, Nexus III can be characterised as the most superficial connection between digitalisation and sustainability, as it basically treats them as two parallel developments to be promoted. But even though Nexus I and II qualify how the digital and sustainability transformation should interact, both nexuses still frequently lack depth with regard to how exactly the digital transformation should and can be made more sustainable (e.g., "The EU is to be a trailblazer in the field of sustainable digitalisation. This means that digitalisation itself is to be environmentally- and climate-friendly so that it does not accelerate climate change" (A16).

With regard to Nexus I, the need for a sustainable digitalisation is for example highlighted in the European Digital Strategy, e.g. in terms of aiming at climate neutral ICT-infrastructure and data centres. The nexus can therefore be described as well-established and stable in terms of EU agenda setting. This has been reflected – to some extent – in the German Council Presidency. With regard to Nexus II, many reports and policy papers by the EC, along with European Council conclusions, also argue for potentials of digitalisation as enabler for a sustainable transition in various action fields. Therefore, one could have expected Nexus II to play a greater role during the German Council Presidency than we have found on the basis of the document analysis. In fact, Nexus II was addressed only rarely and predominantly with little specificity. In particular, the lack of discussion of Nexus II in the context of industry is surprising against the background of the ongoing debate on CE.

3.2 Four areas

With regard to the different areas in which the three nexus types of digitalisation and sustainability are dealt with, nine area categories (plus one additional category dealing with various issues) were identified. The areas are listed in Table 4. The table also shows how many documents were assigned to each area per nexus.

Table 3: Identified area categories per nexus

Area	Short Description of Context	Number of documents per nexus		
		Nexus I	Nexus II	Nexus III
Environment	Attaining environmental sustainability by limiting the negative environmental impact of digital solutions and utilising digitalisation for environmental protection and climate change mitigation purposes.	2	2	3
Transport and mobility	Low-carbon, smart, and innovative transport solutions realised with the help of digital technologies and AI are to ensure sustainable, safe, and efficient means of transport throughout the EU. The German Council Presidency sought	0	6	2

	to position the EU as a global leader in the transport and digital mobility sector through initiating corresponding dialogue and measures.			
Digital economy	Fair taxation and fair competition as well as securing the EU's digital sovereignty, are key to reaching (economic) sustainability within the digital economy. In turn, the digital economy is said to create jobs and business opportunities. To harness the digital economy's potential to contribute to the green transition, the availability of data and computing capacity are indispensable.	5	2	2
Recovery	While addressing the social and economic toll the COVID-19 pandemic had on member states, recovery activities shall be aimed at achieving a more resilient and sustainable economy as well as accelerating the digital transition to foster the EU's digital sovereignty.	1	0	31
Industry	In terms of international industrial competitiveness and post-pandemic economic resilience, great importance is attached to strategic autonomy in the digital domain and, related to this, in the area of critical raw material. In this sense, the idea of an integrated value chain (from the processing of raw materials to production and recycling) for battery cells in Europe was promoted during the German Council Presidency. Under the German Council Presidency, the importance of updating the EC's New Industrial Strategy was stressed and the EC was called upon to develop key performance indicators that reflect policy objectives with regard to the green and digital transition.	1	0	5
Food industry	The European agricultural and food industry is to be made more resource-efficient and competitive through digital technologies such as precision farming.	0	1	1
Consumer protection	Digital products and services are to be designed in a more eco-friendly, circular, resource-efficient, and socially responsible manner. Concretely, this, for example, refers to standards for enhanced product durability and the enforcement of consumer rights. Meanwhile, a green transition and digital transformation also take centre stage in European consumer policy.	1	0	2
Inclusion	Allowing everyone to fully participate in economic and societal life by bridging the digital divide through support, training, and improved access to digital solutions, especially for the most disadvantaged.	0	1	5
International cooperation	Digital connectivity and multilateral cooperation in, e.g., digital infrastructure and logistics, the digitalization of the manufacturing and service sectors, digital innovation, and	0	1	7

	data protection and privacy regulations are viewed as facilitators of sustainable development of the EU as well as for international partners.			
Other	Documents in this context touched upon increasing the use of digital tools and services in the health area, regulatory sandboxes for regulating the digital sphere and Europe's unity. Furthermore, Germany's priorities for the German Council Presidency were discussed.	0	0	6

The quantitative analysis led to two major conclusions:

1. The first three areas (environment, transport and mobility and digital economy) contain the most documents with regard to Sustainable Digitalisation (Nexus I) and/or Digitalisation for Sustainability (Nexus II).
2. What stands out is that digitalisation and sustainability are addressed extremely often in the context of the EU's planned COVID-19 pandemic recovery activities. However, the overwhelming majority of the documents assigned to this area cover digitalisation and sustainability in terms of Nexus III, i.e., as two silos side by side.

Based on these considerations, we decided to investigate the following four areas:

1. **Environment** regarding the nexus types I and II
2. **Transport and Mobility** regarding the nexus types I and II
3. **Digital Economy** regarding the nexus types I and II
4. **Recovery** regarding the nexus type III

They thus form the base of the following four subsections. Sections 3.2.1 to 3.2.4 elaborate on the goals, challenges, and solution approaches that were discussed during the German Council Presidency regarding a sustainable digitalisation (Nexus I) and/or pushing digitalisation as an enabler for sustainability (Nexus II) and refer to identified relevant strategies and initiatives at the EU level that were mentioned within the documents. Furthermore, section 3.2.4 shortly illustrates the parallelism of digitalisation and sustainability as Nexus III in the context of the pandemic recovery.

3.2.1 Environment

With regard to sustainable digitalisation (Nexus I), the Council encourages mitigating adverse environmental impacts of digitalisation itself. For instance, it requested the EC to introduce concrete regulatory or non-regulatory actions to curb the negative environmental impacts of data centres and communication networks and deliver a strategy to decrease the number of discarded ICT products (PM_RAT12). To achieve the stated goal of establishing the EU as a global "trailblazer in the field of sustainable digitalisation" (A16), the objectives of the European Digital Strategy are said to need advancement by launching stronger regulations on "the ecological design and sustainable and socially responsible use of artificial intelligence (AI) in the EU and the potential of such technologies" (A62).

Concerning digitalisation for sustainability (Nexus II), the German Council Presidency ties in with the broader debate and strategy processes on the interplay between digitalisation and environmental protection that has gained traction at the EU level. Particularly the CEAP (Circular Economy Action Plan), the Farm-to-Fork Strategy, and the EU Biodiversity Strategy for 2030, all developed under the umbrella of the EGD, prominently feature digital solutions to address environmental and climate targets (PM_RAT12). Reinforcing this development, the

German government set climate and environmental policy goals for the German Council Presidency, which included inter alia utilising digitalisation to protect the environment and spur innovation (A16). To that end, the Council approved conclusions to harness "digitalisation for the benefit of the environment" (PM_RAT12). In light of the economic damage caused by the COVID-19 pandemic and subsequent recovery efforts, these conclusions highlight the promising potential of digitalisation to create green jobs and a more sustainable, circular, and resilient economy. Despite this social and economic focus, the Council generally encourages the adoption and further development of a more holistic set of initiatives and measures "to exploit the opportunities offered by digitalisation for environmental protection and climate action" (PM_RAT12). These opportunities are seen in the development of data-driven, intelligent networking solutions used "to protect the environment, mitigate climate change and conserve natural resources", for example, in the transport or agricultural sectors (A16, see also A62). Overall, to achieve a digital transition in a fair and inclusive manner and unleash the full potential of digitalisation to enable environmental protection, the Council stresses the importance of coherent and ambitious policies (PM_RAT12). With this in mind, the German Council Presidency also funds projects such as "Generation A=Algorithm" that deals with the challenges and changes AI might have on society through formats such as a climate hackathon to evolve digital solutions to mitigate and adapt to climate change (A61).

3.2.2 Transport and mobility

The German Council Presidency likewise sought to position the EU as a pioneer in the sustainable and digital transport and mobility sector. In this context, however, this goal is discussed exclusively from the perspective of digitalisation for sustainability (Nexus II). Low-carbon, smart, and innovative transport solutions realised with the help of digital technologies and AI are to ensure sustainable, safe, and efficient means of transport throughout the EU (A06, A56). To that end, under the auspices of the German Council Presidency, the EU Ministers of Transport adopted the so-called Passau Declaration (A33, A56). With the Passau Declaration, the relevant national ministries declared to make a joint effort to ensure that Europe fully exploits the opportunities of digitalisation for a sustainable and climate-friendly mobility sector (A33). This Smart Deal for Mobility puts forth targets to improve the quality of life for citizens in remote and urban areas alike and stimulate the economy. Crucial in this concept is the free, sustainable, efficient, and safe movement of people and goods but also data across the continent.

The Ministers of Transport agreed to take measures to support the development of autonomous vehicles or package delivery drones and robots. Through area-wide electricity grids and high-performance data networks, the hope is to ease digital communication and working from home – also post-pandemic – thus saving resources and avoiding emissions in passenger transport (A33). According to the Ministers of Transport and as stipulated in the Passau Declaration, data is the key component for achieving a mobility sector fit for the future:

> "With data, we will create an ever more precise digital model of the physical world. Buildings, plants, water bodies as well as roads will become visible on maps in real time, just like vehicles, individuals, and goods. Only if we achieve highly detailed modelling of the real world can autonomous cars, for instance, drive safely to their destination or drones deliver their package. But data are also useful for planning personal mobility and organising reliable supply chains" (A33).

The German government also introduced the New Mobility Approach as part of the EC's Sustainable and Smart Mobility Strategy issued in December 2020, both of which the Passau Declaration fed into (A06). The German government's initiative is said to be based on an integrated approach to climate protection and innovation in the transport sector (A07). Climate-

friendly transport, digitalisation, and safety are at the core of this innovation strategy, which aims to stimulate research and technological advances in the fields of automatisation, digitalisation, and AI. Other more tangible objectives include the Europe-wide expansion of charging infrastructure for alternative fuels and intensifying their use compared to fossil fuels in general or the development of new synthetic fuels (A06, A07).

The German government seems eager to lead by example vis-à-vis EU fellow member states and promote cutting-edge mobility and transport solutions based on digital tools (A05; A32). This is illustrated by the following two concrete examples in the documents analysed:

1. A group of scientists and software engineers from Berlin's Humboldt University and Technical University has developed a concept and algorithm that uses AI to facilitate mobility as a service in Berlin. The project funded by the BMUV as part of the initiative AI lighthouses for the environment, climate, nature and resources, aims to promote sustainable urban mobility through a new application. It does this by calculating the environmental impact of different routes and combinations of transport modes in real time to suggest the most environmentally transport options for a given route (A05).
2. Similarly, the German Federal Ministry of Transport and Digital Infrastructure has launched the Federal Government Programme on the Future of Rail Freight to shift the predominant share of freight transport from road to rail to link the various modes of freight transport more efficiently and in a more environmentally friendly manner. Digital innovations are ascribed the potential "to move more freight by rail in the long run, thereby relieving the burden on the road infrastructure as well as tackling environmental pollution and climate change" (A32).

3.2.3 Digital economy

Within the context of the digital economy, both nexus types I and II have been discussed during the German Council Presidency. Regarding Nexus I (Sustainable Digitalisation), three interconnected main issues have been stressed (PM_RAT35, A30, A29):

a) fair taxation of corporations in the digital economy,

b) fair competition in the digital market,

c) European digital sovereignty.

a) Fair taxation in the digital economy: The question of fair taxation has been long and widely discussed at the EU level as well as on a global scale. Digital business models with a global scope added another layer to these discussions as these business models pose a challenge for governments to tax business income in the country in which value is created (PT14, PT15). Large multinational companies have the necessary financial resources at their disposal to engage in tax planning schemes, thereby taking advantage of differences in national corporate tax regimes across the EU. This negatively affects the competitive position of small and medium-sized enterprises, as they cannot afford to invest in such tax solutions (PT14). Making sure all digital corporations pay their fair share of taxes is therefore seen as one building block of ensuring a level playing field in the digital economy. As fair taxation counteracts the erosion of a country's tax base, it also finances European means to develop digital sovereignty (see paragraph c). At the same time, well-funded tax bases enable EU member states to take action on the three major challenges frequently addressed during the German Council Presidency: the pandemic, the 'green', and the digital transition (PM_RAT35). In order to tackle the challenge of fair taxation in the digital economy, the Council discussed again new EU rules on the exchange of information on revenue generated on digital platforms and the exchange of tax-relevant data for crypto-assets and e-money. It further recalled the Council conclusions of July 2020 in which it is

noted that the EC, as a basis for own additional resources, will put forward in the first semester of 2021 a proposal for a digital levy. Relevant initiatives mentioned in the documents are the Package for Fair and Simple Taxation by the EC and the Inclusive Framework on Base Erosion and Profit Shifting at OECD level (PM_RAT35). Concerning the latter, a global consensus-based solution on international tax rules was adopted in June 2021.

b) Fair competition in the digital market: Achieving fair competition in the digital economy is seen as a challenge not only due to tax-evading strategies of large digital corporations but especially because digital markets are characterised by large online platforms that act as gatekeepers (A30). As such, they have the power to decide who can enter the markets under which conditions, thereby having a major impact on market competition. On the part of the German Council Presidency, it is demanded that "[c]ertain types of behaviour by major online platforms should be banned" (ibid.). This behaviour is refined as anti-competitive or discriminatory. It is argued that fair competition will enable "online platform ecosystems in the EU to increase their potential and capacity for innovation" (ibid), thereby contributing to the goal to deepen the internal market for and increase consumer confidence in digital services.

In this context, the DSA and the DMA are presented as solution approaches. Furthermore, the German Council Presidency promoted the GAIA-X project that seeks to establish a European Data Infrastructure as a possible approach to counterbalance large online platforms with significant intermediary power (A30). A building block of this project is the so-called GAIA-X hubs, in which associated companies and organisations organise themselves to set up industry-specific data rooms, define requirements for technical infrastructure solutions, and spread GAIA-X solutions. The objectives pursued with GAIA-X again link to the aforementioned envisaged European online platform ecosystems for innovation and ultimately international competitiveness (ibid). Relevant initiatives for GAIA-X by the EC are particularly the European Data Strategy and the Industrial Strategy for Europe.

Somewhat detached from these advances on the part of the German Federal Government, the telecommunications ministers held a policy debate on the proposal for a Data Governance Act introduced by the EC as the first legislative initiative under the European Data Strategy. With the aim to establish EU-wide common interoperable data spaces in strategic sectors (e.g., energy, mobility, or health), the EC intends to promote data availability and cross-sectoral as well as cross-border reuse of data. The ministers were stated to "broadly welcome[d] the proposal as an important enabler for a strong European data economy and increased competitiveness" (PT01).

c) European digital sovereignty: Achieving European digital sovereignty has been stressed frequently during the German Council Presidency, amongst others, by the Minister of State for Digitalisation Dorothee Bär. She seeks to "address the digital transformation of government, the economy and civil society on our own terms", thereby stressing the need of reducing dependencies from US-American and Chinese providers of digital infrastructure (A29). The GAIA-X project is therefore also closely linked to not only enabling fair competition but also digital sovereignty. Dorothee Bär frames GAIA-X as "secure, sovereign, open data infrastructure, on the basis of European values" (ibid). This is linked to the aspiration to reinforce the EU's leadership in strategic international digital value chains in order to safeguard strategic autonomy. European values in the context of the digital age are referred to as respecting fundamental freedoms such as data protection, privacy, safety, and security (PT01). In a similar vein, EU Commissioner for Internal Market Thierry Breton declares that "our citizens and companies need to be able to own, control, use and stock their data in reliable European infrastructures" (A25) and refers to the European Data Strategy and the future Data Act. The 2030 Digital Compass is mentioned as a relevant initiative by the EC, as it intends to establish

long-term monitoring for the EU's strategic digital capacities and capabilities with regard to skills, business, government, and infrastructure (A29, PT01).

Regarding Nexus II (Digitalisation as an enabler for sustainability) various potentials of and for the digital economy were said to be linked to the ever-increasing amount of industrial data and the likewise increasing computing capacity, enabled by technologies such as cloud computing and high-performance computing (A25, PT01). As a prerequisite for AI applications, the availability of data and computing capacity were stressed to be indispensable for the development of intelligent solutions for the green transition "in areas such as farming, mobility, buildings and manufacturing" (PT01). Next to the environmental dimension, the potentials for job and business opportunity creation within the digital economy were highlighted (PT16, A25). One concrete example that was discussed with regard to applying digital tools for the good of market security is the "potential of AI-based programs being used (particularly by online sales platforms and payment systems) to combat trade in pirated goods" (A25).

3.2.4 Recovery

As the COVID-19 pandemic recovery is closely linked to the question of financing economic and social measures to deal with the pandemic's impacts, funding instruments such as the Multiannual Financial Framework, InvestEU, and the Recovery Fund (NextGenerationEU) play a major role in this context (PM_RAT15; PM_RAT21; PM_Rat33; PM_RAT39; PM_RAT41; PM_RAT48; PM_BR07; PM_BR14; A18; A40; A41; A46). Digitalisation and sustainability are frequently addressed together as the twin transition and are stressed to be two major objectives to be pursued within recovery activities (PM_RAT15; PM_RAT21; PM_RAT31; PM_RAT39; PM_RAT41; PM_RAT42; PM_RAT48; PM_BR14; A26). It is repeatedly emphasised that recovery funds shall not only serve to enable a quick and sustainable recovery but are also targeted to assist the progress of the sustainable and digital transition (see e.g., PM_RAT48 or PM_RAT21). Furthermore, this requirement is solidified in the Recovery and Resilience Facility, which is – according to Olaf Scholz – with a financial volume of €672,5 billion "the main instrument of the €750 billion recovery package and will help Europe emerge from the crises stronger, more climate-friendly, more digital and more united (PM_RAT48). Concretely, as the Council supports, at least 37% of the expenditure shall be spent supporting the green transition, while at least 20% shall go towards the digital transformation (ibid.). In particular, digital sovereignty and climate neutrality crystallise as the respective priority goals of the two transitions.

3.3 Arenas and actors' agendas

The results presented in 3.2 show not only that digitalisation and sustainability were debated in different areas during the German Council Presidency, but also in a variety of arenas. Specifically, the topic was taken up in 8 of 10 Council configurations. Table 5 shows which Council configurations addressed digitalisation and sustainability in which area according to the documents analysed.

Table 4: Council configurations addressing digitalisation and sustainability in different contexts

Council configuration	Areas in which Council addressed digitalisation and sustainability
General Affairs Council	*No indication in analysed documents that the topic was addressed*
Foreign Affairs Council	International cooperation

Council configuration	Areas in which Council addressed digitalisation and sustainability
Economic and Financial Affairs Council	Recovery
Justice and Home Affairs Council	*No indication in analysed documents that the topic was addressed*
Employment, Social policy, Health and Consumer Affairs Council	Inclusion
Competitiveness Council	Industry, digital economy, recovery
Transport, Telecommunications and Energy Council	Transport and mobility
Agriculture and Fisheries Council	Food industry
Environment Council	Environment
Education, Youth, Culture and Sport Council	Inclusion

Although individual actors were mentioned in the documents, we could not identify any discernible agendas pursued by different actors. This may have several explanations:

1. The actors do not pursue a clear agenda in relation to digitalisation and sustainability. This explanation seems plausible insofar as the topic was dealt with in the majority of the analysed documents in the form of Nexus III.
2. The documents we analysed are not suitable for identifying the agendas of individual actors with regard to digitalisation and sustainability, as the documents intend to inform the general public with easily accessible and understandable information. Actor's agendas on this topic might be too technical to manifest in these kinds of documents.

However, looking at Table 5, there are indications that with regard to digitalisation and sustainability, the Council in general, emphasises competitiveness, as the topic was addressed from several angles (industry, recovery, digital economy) by the Competitiveness Council.

4 Reflection and future priorities

This study set out to analyse the role of the German Council Presidency regarding topics related to digitalisation and sustainability. The analysis of section 3 has shown that debates have taken place regarding three relations between digitalisation and sustainability (the three nexus types). It has further been argued that the discussions have taken place in nine areas: recovery, consumer protection, digital economy, industry, food industry, transport and mobility, environment, social affairs, and international relations.

In the following, we discuss important contributions of the German Council Presidency linked to digitalisation and sustainability and possible future priorities of the German government in the Council. First, we reflect upon the chosen areas of this analysis, synthesise what types of key themes have been discussed and examine additional themes that could be prioritised in the future (4.1). Second, we discuss which additional areas could become a priority in the future (4.2). Third, we compare the nexus types (I, II and III) with other discussions on digitalisation and sustainability in science, politics, and civil society and point out which additional perspectives might be helpful for future debates (4.3). Finally, we analyse the interlinkages between policy debates on digitalisation and sustainability and additional policy frameworks that might be fruitful to include (4.4).

4.1 Future priority areas that have already received high attention

We investigated four areas in detail. The first three (environment, mobility and transport, and digital economy) were selected because nexuses I and II were regularly discussed in these areas. The fourth area, recovery, was selected because it is the area in which Nexus III was frequently discussed.

4.1.1 Environment

- **Key discussion:** Discussions in this area dealt with both Nexus I and Nexus II - how to make digitalisation more environmentally sustainable and how digitalisation should be used for environmental sustainability throughout the economy. The discussions on sustainable digitalisation covered only parts of existing topics within this area. Topics were the sustainability of data canters and AI applications as well as reducing the number of discarded ICT products.
- **Possible future priorities:** There are more topics related to how the production, usage, and disposal of ICTs can be made more sustainable. Additional issues are: the longevity of devices by design and the development of respective incentives and business models for refurbishment, right to repair, standardisation, higher recycling rates, data intensity of software, the efficiency of networks, and data sufficiency (see Pohl et al. 2021).

4.1.2 Transport and mobility

- **Key discussions:** The documents regarding the area of mobility and transport revealed two policy initiatives started by the German Council Presidency: the Passau Declaration and the New Mobility Approach. The strategies in these initiatives are to stimulate research in automation to be able to expand charging infrastructure for alternative fuels, and shift freight transport from road to rail. The expansion of area-wide electricity grids and high-performance data networks is aimed at facilitating digital communication.

- **Possible future priorities:** The strategy to shift transport from road to rail with the help of digital tools could be strengthened. This should not only refer to freight but also passenger transport. Digital tools could make public transport, in particular across borders, much more convenient and thereby attractive.

4.1.3 Digital Economy

- **Key discussions:** Within the context of the digital economy, the main focus was put on making digitalisation more sustainable (Nexus I). Three interlinked issues have been stressed during the German Council Presidency: Fair taxation and fair competition as well as securing the EU's digital sovereignty, are key to reaching (economic) sustainability within the digital economy. Regarding fair taxation, the Council confirmed the need for new EU rules on the exchange of information on revenue generated on digital platforms and the exchange of tax-relevant data for crypto-assets and e-money. It also emphasised the need for a digital levy brought forward by the EC. With regard to fair competition, the Council promoted the DSA and the DMA. The German Council Presidency stressed the importance of initiatives like GAIA-X for establishing a European Data Infrastructure to counterbalance large online platforms with significant intermediary power but also for enabling digital sovereignty in terms of infrastructure and data pools. Regarding digitalisation for sustainability (Nexus II), the need for the development of enabling technologies such as cloud computing, high-performance computing, and AI have been stressed in order to facilitate a sustainable transition in various areas. The job creation potential of the digital economy was highlighted.
- **Possible future priorities:** Discussions about a sustainable digital economy so far lack the perspective of environmental sustainability. Still, this is an important topic. First, the digital economy uses a large number of devices, server capacities, network capacities, etc. Supporting Green ICT within the digital economy is therefore important to support Green ICT overall. Second, the digital economy could also be geared towards making other sectors more sustainable. For example, environmental sustainability goals could be integrated into the market conditions that are being shaped by the DSA and the DMA.

4.1.4 Recovery

- **Key discussions:** In the documents analysed, it is repeatedly stressed that while the EU's recovery efforts are a key priority, they shall be implemented in a way that supports the overarching goals of reaching a twin transition.
- **Possible future priorities:** A future priority could be to integrate the promotion of the twin transitions i.e. digital and sustainability transitions with recovery plans. This could mean increasing the funding for initiatives that combine both transitions.

4.2 Future context priorities

It is not surprising that the areas: environment, mobility and transport, and digital economy received a lot of attention including sustainable digitalisation (Nexus I) and digitalisation for sustainability (Nexus II), as these are also high on the agenda in discussions on digitalisation and sustainability in other arenas such as policy-discussions in Germany and scientific debates. Other areas that we identified but that received less attention were industry, food industry, consumer protection, inclusion, and international cooperation. At the same time, there are areas that are frequently discussed in relation to nexuses I and II in political and civil society debates in the EU but did not receive much attention during the German Council Presidency.

4.2.1 Circular Economy

It is surprising that the role of digitalisation for a CE has played only a minor role. In the majority of cases, references to the EC's CEAP are made, and the vital role of circularity in the digital and sustainable transition is stressed. However, these stay very general and vague. Concrete references about the role of digitalisation in realising a CE, corresponding to the rationale of Nexus II, are drawn in only two instances throughout all documents (PM_RAT12; PM_RAT13). With respect to making ICT devices more sustainable, following Nexus I, CE and particularly eco-design criteria are ascribed the potential to increase the longevity and reparability of ICT products. In the Environmental Council's reaction to the EC's CEAP, the environment ministers called on the EC to strengthen the CE by specifying eco-design criteria and information requirements in the revision of the relevant legislation announced for 2021.

However, the prospects related to the application of digitalisation for the CE are much broader. It provides information on the resource usage along the entire production chain and thereby provides the information needed to initiate circularity. Digital tools also hold the potential to provide this information rapidly to the actors along the product chain who need it. In addition, digitalisation can support business models for circular products as core elements of circular business models. The EC's main policy approach is the EU Ecodesign Directive which has the potential to strengthen circular thinking. Its application scope should especially consider products with an inherent connection to digitalisation.

4.2.2 Energy systems

The role of digitalisation in transforming energy systems towards renewable energy has barely been addressed. This is surprising, as it is a very important potential of digitalisation to contribute to the environmental transformation. This is a particularly important context for the EU level, as organising the future energy system at the European level rather than the national level is a key component for facilitating energy transitions.

4.2.3 Housing

The issue of housing and, in particular, smart homes has not been brought up in the German Council Presidency. The effects of smart homes on energy consumption are ambivalent. On the one hand, an integrated energy system can reduce energy consumption in heating. On the other hand, the production and the use of smart devices needs resources and energy. In addition, the purchase of digital devices that facilitate smart heating is often associated with purchasing additional smart home products, whose production and usage uses energy and resources.

4.2.4 Biodiversity

Finally, there are some links to biodiversity in the documents analysed. This is not surprising as a key report in preparing the German Council Presidency laid a central focus on this issue (Hedberg and Šipka 2020b). Corresponding references are limited to statements that are linked to the EU Biodiversity Strategy for 2030 that builds on digital applications to achieve environmental goals (PM_RAT12; A16; A18; A23; A60; PM_BR10; PM_RAT04; PM_RAT06).

4.3 Future nexus types

Looking at the nexus types reveals that the German Council Presidency has spurred many discussions on digitalisation and sustainability. Out of 67 press releases, articles, and speeches found in the area of digitalisation and 180 in the area of sustainability, 87 of these documents contained some kind of nexus between these two topics. Although we have not compared the

debates of this presidency with former ones, it seems that the German government has put the issues high on the agenda. It is also notable that not only environmental but also social aspects of sustainability have received much attention. However, it often is the case that the two transitions – digital and sustainable – are discussed separately rather than integrated, as 64 press releases, articles, and speeches out of 87 have been attributed to Nexus III. In the following, we point out two additional nexuses, which we have not found in the documents, but which are part of other discussions in science, politics, and civil society.

4.3.1 Sufficiency measures vs. rebound effects and economic growth

It is often argued that digitalisation does not only have the potentials to be harnessed (Nexus II) and that digital devices and the digital economy need to be made sustainable (Nexus I). Rather, digitalisation is associated with additional environmental risks. These environmental risks are heterogeneous due to the large number of different digital technologies and their applications. One central concept refers to the rebound effects of digitalisation, where increased efficiency can also lead to more consumption of digital technologies and services (Coroama and Mattern 2019). Such rebound effects are strongly connected to economic growth, as additional consumption is a driver of growth. Digitalisation is also said to contribute to economic growth by increasing labour productivity in production (Brynjolfsson and McAfee 2014). However, it is questionable whether a strong surge in economic growth in European countries due to digitalisation can be compatible with environmental goals (Lange and Santarius 2020). Based on such analysis, the consideration of the use of digitalisation for sufficiency arises. In a narrow sense, digital sufficiency refers to reducing the environmental footprint of the use of digital devices by reducing their number, increasing their longevity, or programming less data-intensive software (Hilty 2012). In a broader sense, it entails using digital tools for sufficient lifestyles or even a sufficient organisation of economic production (Lange and Santarius 2020).

4.3.2 System innovation vs. perpetuation of existing systems

Another risk may lie in digitalisation perpetuating unsustainable systems. For example, the application of digital technologies in agriculture is mostly pursued as part of precision farming. Here, sensors and data are used to optimise – and thereby reduce – the number of fertilisers and pesticides. However, the machines used are still based on monocultural, large-scale production. Whether the environmental transformation needed can be achieved within this old agricultural paradigm with the help of digital tools is questionable (Hilbeck and Tisselli 2020; Rotz et al. 2019). Instead, radical economic changes are needed to stay within climate and other environmental limits and system innovations are necessary to change economic sectors. Therefore, a key question is how digitalisation can help shape such system innovations.

4.4 Possible future policy frameworks

As we have seen in our analysis, the relation between digitalisation and sustainability relates to many policy frameworks, among others: the EGD, the New Industrial Strategy for Europe, the CEAP, the Farm-to-Fork Strategy, the Sustainable and Smart Mobility Strategy and the EU Biodiversity Strategy for 2030. The prominent perspective in these policy frameworks is that digital technologies can and should be used to improve environmental sustainability. A future priority could be to also address the issue of sustainability in policy frameworks that so far only deal with topics on digitalisation. The main policy frameworks currently under discussion are: The European Digital Strategy, the DSA, the DMA, and the Artificial Intelligence Act. Here, environmental sustainability often plays no or only a small role.

5 Conclusion

The German Council Presidency has moved forward the agenda on digitalisation and sustainability on multiple fronts. Thus, it seems that the high prioritisation of the BMUV to achieve an "environmentally and climate-friendly digitalisation" (BMUV, n.d.) has borne fruit. Most importantly, the issue of sustainable digitalisation (Nexus I in our debate) has gained substantial attention. Several initiatives have promoted a constructive role for digitalisation in mobility, social aspects of sustainability have been incorporated into digital economy policies, and sustainability and digitalisation have become central pillars of EU recovery funding.

At the same time, we found that digitalisation and sustainability are often treated as separate aspects – what we call digitalisation and sustainability in two silos (Nexus III). In fact, the majority of documents treat digitalisation and sustainability in this manner. Hence, the integration of the two aspects can still be improved throughout different policy fields.

Regarding the areas in which the debates took place, the result is mixed. As argued in section 4, some important areas have been discussed, while other important ones have barely been addressed. Comparing this to the study by the European Policy Centre (EPC), which was an input before the start of the presidency, the picture is also mixed. The EPC indicated five important areas. Two of them have received substantial coverage by the German Council Presidency: mobility (see section 3.2.2) and greening ICT (see section 3.1.1). The other three areas received little attention: CE, agriculture and biodiversity.

Our analysis has further indicated that there are many promising topics that could be addressed in the future. Out of these, three are particularly relevant for the German government to drive the agenda on digitalisation and sustainability in the future. First, the role of digitalisation for a CE is promising to foster sustainability – and the upcoming revision of the Ecodesign Directive in the year 2022 provides possibilities for concrete action (see section 4.2.1). Second, the aspect of environmental sustainability should be introduced into discussions on how to shape the digital economy. There are several policy frameworks where this could be introduced in 2022 and beyond (see sections 4.1.3 and 4.4). Third, the perspectives on digitalisation and sustainability pursued by the German government should be broadened. Additional nexus types on sufficiency and system innovations (see section 4.3) that aim to combine digital and sustainability transitions could help to support the deep change that are needed.

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A Appendix

Table 5 gives an overview of all press releases, articles and speeches found at the nexus of digitalisation and sustainability during the process of material search described in section 2. It is sorted by the document types that we searched for and presents the respective document title and website link. The last column shows the abbreviations for each document that we assigned in the process of material selection.

Table 5: Press releases, articles and speeches identified at the nexus of digitalisation and sustainability

Document type	Title	Link	Document Code
Press releases Council	EU-ASEAN joint ministerial statement on connectivity	https://www.consilium.europa.eu/en/press/press-releases/2020/12/01/eu-asean-joint-ministerial-statement-on-connectivity/	PM_RAT03
	Co-chairs' press release of the 23rd ASEAN-EU ministerial meeting	https://www.consilium.europa.eu/en/press/press-releases/2020/12/01/co-chairs-press-release-of-the-23rd-asean-eu-ministerial-meeting/	PM_RAT04
	Joint Statement of the Members of the EEA Council	https://www.consilium.europa.eu/en/press/press-releases/2020/11/18/joint-statement-of-the-members-of-the-eea-council/	PM_RAT06
	Towards a more dynamic, resilient and competitive European industry: Council adopts conclusions	https://www.consilium.europa.eu/en/press/press-releases/2020/11/16/towards-a-more-dynamic-resilient-and-competitive-european-industry-council-adopts-conclusions/	PM_RAT07
	EU4Health programme: Council agrees its negotiating position	https://www.consilium.europa.eu/en/press/press-releases/2020/10/21/eu4health-programme-council-agrees-its-negotiating-position/	PM_RAT08
	Digitalisation for the benefit of the environment: Council approves conclusions	https://www.consilium.europa.eu/en/press/press-releases/2020/12/17/digitalisation-for-the-benefit-of-the-environment-council-approves-conclusions/	PM_RAT12
	Council approves conclusions on making the recovery circular and green	https://www.consilium.europa.eu/en/press/press-releases/2020/12/17/council-approves-conclusions-on-making-the-recovery-circular-and-green/	PM_RAT13
	Multiannual financial framework for 2021-2027 adopted	https://www.consilium.europa.eu/en/press/press-releases/2020/12/17/multiannual-financial-framework-for-2021-2027-adopted/	PM_RAT15
	Regulatory sandboxes and experimentation clauses as tools for better regulation: Council adopts conclusions	https://www.consilium.europa.eu/en/press/press-releases/2020/11/16/regulatory-sandboxes-and-experimentation-clauses-as-tools-for-better-regulation-council-adopts-conclusions/	PM_RAT20

Document type	Title	Link	Document Code
	Macroeconomic dialogue at political level, 3 November 2020	https://www.consilium.europa.eu/en/press/press-releases/2020/11/03/macroeconomic-dialogue-at-political-level-3-november-2020/	PM_RAT21
	EU budget for 2021: Council agrees position	https://www.consilium.europa.eu/en/press/press-releases/2020/09/09/eu-budget-for-2021-council-agrees-position/	PM_RAT31
	InvestEU: Council greenlights provisional agreement reached with the Parliament	https://www.consilium.europa.eu/en/press/press-releases/2020/12/16/investeu-council-greenlights-provisional-agreement-reached-with-the-parliament/	PM_RAT33
	Council and Parliament reach provisional political agreement on new framework for regional investment	https://www.consilium.europa.eu/en/press/press-releases/2020/12/08/council-and-parliament-reach-provisional-political-agreement-on-new-framework-for-regional-investment/	PM_RAT34
	Fair and effective taxation: Council adopts conclusions	https://www.consilium.europa.eu/en/press/press-releases/2020/11/27/council-conclusions-on-fair-and-effective-taxation-in-times-of-recovery-on-tax-challenges-linked-to-digitalisation-and-on-tax-good-governance-in-the-eu-and-beyond/	PM_RAT35
	Pandemic contingency plan for freight transport - Council adopts conclusions	https://www.consilium.europa.eu/en/press/press-releases/2020/10/23/pandemic-contingency-plan-for-freight-transport-council-adopts-conclusions/	PM_RAT36
	Next multiannual financial framework and recovery package: Council moves to finalise adoption	https://www.consilium.europa.eu/en/press/press-releases/2020/12/14/next-multiannual-financial-framework-and-recovery-package-council-moves-to-finalise-adoption/	PM_RAT39
	Council conclusions on European Union – United States relations	https://www.consilium.europa.eu/en/press/press-releases/2020/12/07/council-conclusions-on-european-union-united-states-relations/	PM_RAT40
	EU budget for 2021: Council and Parliament reach common understanding	https://www.consilium.europa.eu/en/press/press-releases/2020/12/04/eu-budget-for-2021-council-and-parliament-reach-common-understanding/	PM_RAT41
	Capital Markets Union: Council approves conclusions on the Commission's new action plan	https://www.consilium.europa.eu/en/press/press-releases/2020/12/04/capital-markets-union-council-approves-conclusions-on-the-commission-s-new-action-plan/	PM_RAT42
	Council and Parliament reach provisional political agreement on cohesion policy rules	https://www.consilium.europa.eu/en/press/press-releases/2020/12/01/council-and-parliament-reach-provisional-political-agreement-on-cohesion-policy-rules/	PM_RAT44

Document type	Title	Link	Document Code
	COVID-19: Council agrees its position on the Recovery and Resilience Facility	https://www.consilium.europa.eu/en/press/press-releases/2020/10/09/covid-19-council-agrees-its-position-on-the-recovery-and-resilience-facility/	PM_RAT48
	European Semester 2020: country-specific recommendations adopted	https://www.consilium.europa.eu/en/press/press-releases/2020/07/20/european-semester-2020-country-specific-recommendations-adopted/	PM_RAT52
	EU priorities at the United Nations and the 75th United Nations General Assembly adopted	https://www.consilium.europa.eu/en/press/press-releases/2020/07/13/eu-priorities-at-the-united-nations-and-the-75th-united-nations-general-assembly-adopted/	PM_RAT54
Press release German Federal Governme nt	German Education Minister Anja Karliczek: Making vocational education and training in Europe attractive and fit for the future	https://www.eu2020.de/eu2020-en/news/pressemitteilungen/informal-meeting-european-ministers-education-osnabrueck/2385478	PM_BR01
	European Sustainable Finance Summit: German government calls on European companies to make sustainable investments	https://www.eu2020.de/eu2020-en/news/article/european-sustainable-finance-summit-schulze-scholz/2398578	PM_BR03
	Minister of Agriculture Klöckner: Europe confirms its commitment to a sustainable and economically viable agri-food industry	https://www.eu2020.de/eu2020-en/news/pressemitteilungen/council-agriculture-ministers-farm-to-fork-conclusions/2408236	PM_BR02
	Europe makes progress on battery cell production: Opening of European Networking Conference on Batteries	https://www.eu2020.de/eu2020-en/news/pressemitteilungen/battery-battery-cell-product-bmwi-research/2419970	PM_BR04
	Informal videoconference of the EU Ministers for Consumer Protection: Strengthening European consumer protection and enabling it to withstand future crisis	https://www.eu2020.de/eu2020-en/news/pressemitteilungen/informal-videoconference-of-the-eu-ministers-for-consumer-protection-new-consumer-agenda-/2424344	PM_BR05
	Federal Minister Altmaier in Brussels for talks with the European Commission	https://www.eu2020.de/eu2020-en/news/pressemitteilungen/minister-altmaier-brussels/2367128	PM_BR06

Document type	Title	Link	Document Code
	A trio working together for the EU: Federal Minister Altmaier and his Portuguese and Slovenian counterparts prepare handover of Council Presidency	https://www.eu2020.de/eu2020-en/news/pressemitteilungen/trio-handover-portugal-slovenia-altmaier/2428050	PM_BR07
	European Environment Council favours EU-wide right to repair and greater product durability	https://www.eu2020.de/eu2020-en/news/pressemitteilungen/enviromental-council-right-to-repair/2429136	PM_BR08
	Foreign Minister Maas on the agreement with the European Parliament on the corona recovery package: A huge step for Europe's economic recovery	https://www.eu2020.de/eu2020-en/news/pressemitteilungen/mehrjaehriger-finanzrahmen-einigung-deutsche-eu-ratspraesidentschaft/2415356	PM_BR10
	European SME Assembly on 16 and 17 November: Federal Minister Altmaier and EU Commissioner Breton provide a fresh impetus for the future of European SMEs	https://www.eu2020.de/eu2020-en/news/pressemitteilungen/european-sme-assembly/2416846	PM_BR12
	EU budget for 2021: Council and Parliament reach common understanding	https://www.eu2020.de/eu2020-en/news/pressemitteilungen/eu-budget-2021-conciliation-council-parliament/2423794	PM_BR14
Articles	Chancellor Merkel in the European Parliament "This Europe is capable of great things"	https://www.eu2020.de/eu2020-en/news/article/merkel-european-parliament/2365778	A01
	What you want to know: Agriculture in the European Union	https://www.eu2020.de/eu2020-en/news/article/-/2380508	A02
	From vocational training to the pandemic: Questions and answers on the Informal Meeting of EU Education Ministers	https://www.eu2020.de/eu2020-en/news/article/eu-education-ministers-strengthening-vocational-training-osnabruck/2385956	A03
	Citytour through green Berlin: Europe happens here	https://www.eu2020.de/eu2020-en/news/article/eu-environment-ministers-green-berlin/2401230	A05
	Virtual Informal Meeting of EU transport Ministers: Bringing together sustainability, mobility and digitalisation	https://www.eu2020.de/eu2020-en/news/article/sustainability-mobility-digital-infrasructure-eu-transport-ministers/2411156	A06

Document type	Title	Link	Document Code
	The EU's common transport policy	https://www.eu2020.de/eu2020-en/news/article/transport-europe-decarbonisation-digitalisation-liberalisation/2410756	A07
	The World Trade Organization (WTO)	https://www.eu2020.de/eu2020-en/news/article/world-trade-organizationreforms-eu/2390784	A08
	SME policy in the EU	https://www.eu2020.de/eu2020-en/news/article/looking-back-looking-ahead-sme/2416916	A09
	Online conference: Supporting European families during the COVID-19 pandemic	https://www.eu2020.de/eu2020-en/news/article/online-conference-supporting-european-families-covid-19-pandemic/2422782	A10
	Democracy and social participation in the EU	https://www.eu2020.de/eu2020-en/news/article/democracy-and-social-participation-in-the-eu/2421556	A11
	Citytour in Wiesbaden: Europe happens here	https://www.eu2020.de/eu2020-en/news/article/citytour-wiesbaden-german-eu-spresidency/2421634	A12
	Informal Videoconference of EU Ministers for Consumer Protection: Focus on digitalisation and sustainability	https://www.eu2020.de/eu2020-en/news/article/informelle-videokonferenz-der-verbraucherschutzminister-eu-neue-verbraucheragenda/2423686	A13
	Videoconference of EU Transport Ministers: For climate-friendly mobility	https://www.eu2020.de/eu2020-en/news/article/transport-toll-mobilities-road-user-charges/2424206	A14
	Environment Council in Brussels: These topics were on the agenda	https://www.eu2020.de/eu2020-en/news/article/eu-climate-change-emissions-council/2427848	A15
	On the way to a European Climate Law: Questions and answers about climate and environmental policy	https://www.eu2020.de/eu2020-en/news/article/environment-climate-eu-green-deal-faq/2398898	A16
	Taking stock of Germany's Presidency of the Council of the EU: "Together for Europe's recovery"	https://www.eu2020.de/eu2020-en/news/article/taking-stock-german-presidency/2430358	A18
	Germany and Portugal – together for Europe	https://www.eu2020.de/eu2020-en/news/article/germany-and-portugal-together-for-europe/2430086	A19
	Q&A about Germany's Presidency of the Council of the European Union	https://www.eu2020.de/eu2020-en/news/article/german-presidency-council-eu-faq/2325428	A21

Document type	Title	Link	Document Code
	Trio Programme of the Council of the European Union (1 July 2020 - 31 December 2021)	https://www.eu2020.de/eu2020-en/news/article/trio-programme-germany-portugal-slovenia/2353560	A22
	Code4Green: European Environmental Data Hackathon	https://www.eu2020.de/eu2020-en/news/article/european-environmental-hackathon/2367194	A23
	Virtual meeting of EU environment ministers: European Climate Law was on the agenda	https://www.eu2020.de/eu2020-en/news/article/environment-ministers-climate-neutral-2050/2367330	A24
	Online Conference of the Federal Ministry of Justice: Data Economy, AI and Intellectual Property	https://www.eu2020.de/eu2020-en/news/pressemitteilungen/data-economy-ai-intellectual-property-bmjv-lambrecht/2381948	A25
	Minister for Economic Affairs Altmaier: Functioning and forward-looking internal market essential for Europe's economic base	https://www.eu2020.de/eu2020-en/news/article/informal-videoconference-of-eu-ministers-for-internal-market-and-industry/2385392	A26
	Foreign Minister Heiko Maas on the 30th anniversary of German reunification: "What belongs together, grows together"	https://www.eu2020.de/eu2020-en/news/article/heiko-maas-german-reunification-30-years/2399970	A27
	Tripartite Social Summit: We can only master the crisis together	https://www.eu2020.de/eu2020-en/news/article/merkel-tripartite-social-summit/2405566	A28
	Interview with Minister of State Dorothee Bär: "We will shape digital transformation on our own terms"	https://www.eu2020.de/eu2020-en/news/article/dorothee-baer-gaia-x-digitalisation-europe/2405534	A29
	What you want to know: Digital policy in the European Union	https://www.eu2020.de/eu2020-en/news/article/three-questions-digital-europe-gaia-x/2404862	A30
	What you want to know: Competitiveness in the European Union	https://www.eu2020.de/eu2020-en/news/article/three-questions-competition-policy-eu/2408298	A31
	What you want to know: Transport policy	https://www.eu2020.de/eu2020-en/news/article/transport-and-digital-policy-eu/2411144	A32
	Virtual Informal Meeting of EU transport ministers: Passau Declaration lays	https://www.eu2020.de/eu2020-en/news/article/passau-declaration-eu-	A33

Document type	Title	Link	Document Code
	groundwork for digital mobility in Europe	transport-ministers-virtual-informal-meeting/2412078	
	Videoconference of EU Research Ministers: Questions and answers on Horizon Europe	https://www.eu2020.de/eu2020-en/news/article/horizon-europa-karliczek-eu-research/2422896	A34
	EU Charter of Fundamental Rights turns 20: "Improving people's lives in Europe"	https://www.eu2020.de/eu2020-en/news/article/-/2423222	A35
	Chancellor's government statement: Cohesion and solidarity during the pandemic	https://www.eu2020.de/eu2020-en/news/article/chancellor-merkel-statement-bundestag-eu-presidency/2354372	A36
	Focus areas agreed: Programme for Germany's Presidency of the Council of the EU in place	https://www.eu2020.de/eu2020-en/news/article/-/2357724	A37
	Chancellor Merkel in conversation with Commission President von der Leyen: Focus on overcoming the crisis and on the future	https://www.eu2020.de/eu2020-en/news/article/exchange-german-presidency-european-commission/2363170	A38
	Spanish Prime Minister in Berlin: Getting Europe back on course for growth	https://www.eu2020.de/eu2020-en/news/article/s%C3%A1nchez-and-merkel-in-berlin/2368312	A39
	European Council: "Geared to Europe's future"	https://www.eu2020.de/eu2020-en/news/article/european-council-recovery-merkel/2370398	A40
	In brief: The new Multiannual Financial Framework	https://www.eu2020.de/eu2020-en/news/article/faq-mfr-euro-budget/2376186	A41
	Europe's single market	https://www.eu2020.de/eu2020-en/news/article/-/2406352	A42
	Independent, inclusive and innovative: Four goals of the German Presidency for the digital sector	https://www.eu2020.de/eu2020-en/news/article/digitalziele-eu2020/2405548	A43
	Videoconference of EU Economics and Finance Ministers: A look back at the meeting	https://www.eu2020.de/eu2020-en/news/article/german-finance-minister-olaf-scholz-ecofin-money-laundering-terrorism/2412880	A44
	Commissioner Breton and Minister Altmaier open 7th European Cluster	https://www.eu2020.de/eu2020-en/news/pressemitteilungen/7th-european-cluster-conference/2414730	A45

Document type	Title	Link	Document Code
	Conference: "Together we must act resolutely"		
	EU budget and Next Generation EU recovery fund: What happens now?	https://www.eu2020.de/eu2020-en/news/article/faq-mff-eu2020-maas/2416420	A46
	Presidency of the Council of the EU: Driving Europe forward as a trio	https://www.eu2020.de/eu2020-en/news/article/trio-presidency-merkel/2357750	A47
	Launch of Presidency and debate in Parliament: "Expectations of the Presidency of the Council of the European Union are high"	https://www.eu2020.de/eu2020-en/news/article/merkel-eu-presidency-bundestag/2361986	A48
	Meeting of the Competitiveness Council in Brussels: Research and innovation on the agenda	https://www.eu2020.de/eu2020-en/news/article/-/2397936	A52
	Special European Council in Brussels: Agreement on Belarus sanctions	https://www.eu2020.de/eu2020-en/news/article/european-council-foreign-and-economic-policy-in-focus/2401732	A53
	Virtual Informal Meeting of EU transport ministers: "Harnessing the digital revolution to make the mobility of the future"	https://www.eu2020.de/eu2020-en/news/article/eu-transport-ministers-digital-revolution-mobility-future-/2410136	A56
	Videoconference of EU Development Ministers: Sustainable Development Goals and gender equality on today's agenda	https://www.eu2020.de/eu2020-en/news/article/sustainable-goals-eu-ministers-gender-equality/2419186	A59
	Closer cooperation across the Atlantic: Meeting of foreign ministers from the EU, Latin America and the Caribbean	https://www.eu2020.de/eu2020-en/news/article/eu-lak-meeting/2426808	A60
	Looking back: A review of the cultural programme of Germany's Presidency of the Council of the EU	https://www.eu2020.de/eu2020-en/news/article/final-picture-galleries-culture-german-presidency-of-the-council-of-the-eu/2430094	A61
Speeches	Opening Speech by Federal Foreign Minister Heiko Maas at the Conference "Young People, Migration and the Demographic	https://www.eu2020.de/eu2020-en/news/reden/speech-heiko-mass-western-balkans-conference-youth-migration-demographics/2410496	R01

Document type	Title	Link	Document Code
	Challenge in the Western Balkans"		
	Speech by Federal Chancellor Angela Merkel on the German Presidency of the Council of the EU 2020 to the European Parliament in Brussels on 8 July 2020	https://www.eu2020.de/eu2020-en/news/reden/speech-chancellor-merkel-european-parliament/2366782	R02
	Opening address by Federal Minister for Foreign Affairs Heiko Maas at the Virtual Annual Council Meeting of the European Council for Foreign Relations (ECFR)	https://www.eu2020.de/eu2020-en/news/reden/heiko-maas-ecfr-eu-council-presidency/2358814	R03

B Appendix

Table 6 gives an overview of all press releases, articles and speeches selected for further analysis based on the identification of four main contexts (environment, transport and mobility, digital economy and recovery). It is sorted by the document types that we searched for and presents the respective document title and website link. The last column shows the abbreviations for each document that we assigned in the process of material selection.

Table 6: Press releases, articles and speeches selected for further analysis

Document type	Title	Link	Document Code
Press releases Council	Digitalisation for the benefit of the environment: Council approves conclusions	https://www.consilium.europa.eu/en/press/press-releases/2020/12/17/digitalisation-for-the-benefit-of-the-environment-council-approves-conclusions/	PM_RAT12
	Multiannual financial framework for 2021-2027 adopted	https://www.consilium.europa.eu/en/press/press-releases/2020/12/17/multiannual-financial-framework-for-2021-2027-adopted/	PM_RAT15
	Macroeconomic dialogue at political level, 3 November 2020	https://www.consilium.europa.eu/en/press/press-releases/2020/11/03/macroeconomic-dialogue-at-political-level-3-november-2020/	PM_RAT21
	EU budget for 2021: Council agrees position	https://www.consilium.europa.eu/en/press/press-releases/2020/09/09/eu-budget-for-2021-council-agrees-position/	PM_RAT31
	InvestEU: Council greenlights provisional agreement reached with the Parliament	https://www.consilium.europa.eu/en/press/press-releases/2020/12/16/investeu-council-greenlights-provisional-agreement-reached-with-the-parliament/	PM_RAT33
	Council and Parliament reach provisional political agreement on new framework for regional investment	https://www.consilium.europa.eu/en/press/press-releases/2020/12/08/council-and-parliament-reach-provisional-political-agreement-on-new-framework-for-regional-investment/	PM_RAT34
	Fair and effective taxation: Council adopts conclusions	https://www.consilium.europa.eu/en/press/press-releases/2020/11/27/council-conclusions-on-fair-and-effective-taxation-in-times-of-recovery-on-tax-challenges-linked-to-digitalisation-and-on-tax-good-governance-in-the-eu-and-beyond/	PM_RAT35
	Next multiannual financial framework and recovery package: Council moves to finalise adoption	https://www.consilium.europa.eu/en/press/press-releases/2020/12/14/next-multiannual-financial-framework-and-recovery-package-council-moves-to-finalise-adoption/	PM_RAT39
	EU budget for 2021: Council and Parliament reach common understanding	https://www.consilium.europa.eu/en/press/press-releases/2020/12/04/eu-budget-for-2021-council-and-parliament-reach-common-understanding/	PM_RAT41

Document type	Title	Link	Document Code
	Capital Markets Union: Council approves conclusions on the Commission's new action plan	https://www.consilium.europa.eu/en/press/press-releases/2020/12/04/capital-markets-union-council-approves-conclusions-on-the-commission-s-new-action-plan/	PM_RAT42
	Council agrees its position on the Recovery and Resilience Facility	https://www.consilium.europa.eu/en/press/press-releases/2020/10/09/covid-19-council-agrees-its-position-on-the-recovery-and-resilience-facility/	PM_RAT48
Press releases German Federal Government	Federal Minister Altmaier in Brussels for talks with the European Commission	https://www.eu2020.de/eu2020-en/news/pressemitteilungen/minister-altmaier-brussels/2367128	PM_BR06
	A trio working together for the EU: Federal Minister Altmaier and his Portuguese and Slovenian counterparts prepare handover of Council Presidency	https://www.eu2020.de/eu2020-en/news/pressemitteilungen/trio-handover-portugal-slovenia-altmaier/2428050	PM_BR07
	Foreign Minister Maas on the agreement with the European Parliament on the corona recovery package: A huge step for Europe's economic recovery	https://www.eu2020.de/eu2020-en/news/pressemitteilungen/mehrjaehriger-finanzrahmen-einigung-deutsche-eu-ratspraesidentschaft/2415356	PM_BR10
	European SME Assembly on 16 and 17 November: Federal Minister Altmaier and EU Commissioner Breton provide a fresh impetus for the future of European SMEs	https://www.eu2020.de/eu2020-en/news/pressemitteilungen/european-sme-assembly/2416846	PM_BR12
	EU budget for 2021: Council and Parliament reach common understanding	https://www.eu2020.de/eu2020-en/news/pressemitteilungen/eu-budget-2021-conciliation-council-parliament/2423794	PM_BR14
Articles	Chancellor Merkel in the European Parliament: "This Europe is capable of great things"	https://www.eu2020.de/eu2020-en/news/article/merkel-european-parliament/2365778	A01
	Citytour through green Berlin: Europe happens here	https://www.eu2020.de/eu2020-en/news/article/eu-environment-ministers-green-berlin/2401230	A05

Document type	Title	Link	Document Code
	Virtual Informal Meeting of EU transport Ministers: Bringing together sustainability, mobility and digitalisation	https://www.eu2020.de/eu2020-en/news/article/sustainability-mobility-digital-infrasructure-eu-transport-ministers/2411156	A06
	The EU's common transport policy	https://www.eu2020.de/eu2020-en/news/article/transport-europe-decarbonisation-digitalisation-liberalisation/2410756	A07
	On the way to a European Climate Law: Questions and answers about climate and environmental policy	https://www.eu2020.de/eu2020-en/news/article/environment-climate-eu-green-deal-faq/2398898	A16
	Taking stock of Germany's Presidency of the Council of the EU: "Together for Europe's recovery"	https://www.eu2020.de/eu2020-en/news/article/taking-stock-german-presidency/2430358	A18
	Online Conference of the Federal Ministry of Justice: Data Economy, AI and Intellectual Property	https://www.eu2020.de/eu2020-en/news/pressemitteilungen/data-economy-ai-intellectual-property-bmjv-lambrecht/2381948	A25
	Minister for Economic Affairs Altmaier: Functioning and forward-looking internal market essential for Europe's economic base	https://www.eu2020.de/eu2020-en/news/article/informal-videoconference-of-eu-ministers-for-internal-market-and-industry/2385392	A26
	Tripartite Social Summit: We can only master the crisis together	https://www.eu2020.de/eu2020-en/news/article/merkel-tripartite-social-summit/2405566	A28
	Interview with Minister of State Dorothee Bär: "We will shape digital transformation on our own terms"	https://www.eu2020.de/eu2020-en/news/article/dorothee-baer-gaia-x-digitalisation-europe/2405534	A29
	What you want to know: Digital policy in the European Union	https://www.eu2020.de/eu2020-en/news/article/three-questions-digital-europe-gaia-x/2404862	A30
	What you want to know: Transport policy	https://www.eu2020.de/eu2020-en/news/article/transport-and-digital-policy-eu/2411144	A32

Document type	Title	Link	Document Code
	Virtual Informal Meeting of EU transport ministers: Passau Declaration lays groundwork for digital mobility Europe	https://www.eu2020.de/eu2020-en/news/article/passau-declaration-eu-transport-ministers-virtual-informal-meeting/2412078	A33
	Chancellor's government statement: Cohesion and solidarity during the pandemic	https://www.eu2020.de/eu2020-en/news/article/chancellor-merkel-statement-bundestag-eu-presidency/2354372	A36
	Focus areas agreed: Programme for Germany's Presidency of the Council of the EU in place	https://www.eu2020.de/eu2020-en/news/article/-/2357724	A37
	Chancellor Merkel in conversation with Commission President von der Leyen: Focus on overcoming the crisis and on the future	https://www.eu2020.de/eu2020-en/news/article/exchange-german-presidency-european-commission/2363170	A38
	Spanish Prime Minister in Berlin: Getting Europe back on course for growth	https://www.eu2020.de/eu2020-en/news/article/s%C3%A1nchez-and-merkel-in-berlin/2368312	A39
	European Council: "Geared to Europe's future"	https://www.eu2020.de/eu2020-en/news/article/european-council-recovery-merkel/2370398	A40
	Europe's single market	https://www.eu2020.de/eu2020-en/news/article/-/2406352	A42
	In brief: The new Multiannual Financial Framework	https://www.eu2020.de/eu2020-en/news/article/faq-mfr-euro-budget/2376186	A41
	Independent, inclusive and innovative: Four goals of the German Presidency for the digital sector	https://www.eu2020.de/eu2020-en/news/article/digitalziele-eu2020/2405548	A43
	Videoconference of EU Economic and Finance Ministers: A look back at the meeting	https://www.eu2020.de/eu2020-en/news/article/german-finance-minister-olaf-scholz-ecofin-money-laundering-terrorism/2412880	A44
	Commissioner Breton and Minister Altmaier open 7th European Cluster Conference:	https://www.eu2020.de/eu2020-en/news/pressemitteilungen/7th-european-cluster-conference/2414730	A45

Document type	Title	Link	Document Code
	"Together we must act resolutely"		
	EU budget and Next Generation EU recovery fund: What happens now?	https://www.eu2020.de/eu2020-en/news/article/faq-mff-eu2020-maas/2416420	A46
	Presidency of the Council of the EU: Driving Europe forward as a trio	https://www.eu2020.de/eu2020-en/news/article/trio-presidency-merkel/2357750	A47
	Launch of Presidency and debate in Parliament: "Expectations of the Presidency of the Council of the European Union are high"	https://www.eu2020.de/eu2020-en/news/article/merkel-eu-presidency-bundestag/2361986	A48
	Virtual Informal Meeting of EU transport ministers: "Harnessing the digital revolution to make the mobility of the future"	https://www.eu2020.de/eu2020-en/news/article/eu-transport-ministers-digital-revolution-mobility-future-/2410136	A56
	Videoconference of EU Development Ministers: Sustainable Development Goals and gender equality on today's agenda	https://www.eu2020.de/eu2020-en/news/article/sustainable-goals-eu-ministers-gender-equality/2419186	A59
	Looking back: A review of the cultural programme of Germany's Presidency of the Council of the EU	https://www.eu2020.de/eu2020-en/news/article/final-picture-galleries-culture-german-presidency-of-the-council-of-the-eu/2430094	A61
	Expanding the EU's digital sovereignty	https://www.eu2020.de/eu2020-en/eu-digitalisation-technology-sovereignty/2352828	A62
Speech	Opening address by Federal Minister for Foreign Affairs Heiko Maas at the Virtual Annual Council Meeting of the European Council for Foreign Relations (ECFR)	https://www.eu2020.de/eu2020-en/news/reden/heiko-maas-ecfr-eu-council-presidency/2358814	R03

C Appendix

Table 7 gives an overview of all background reports selected for additional consultation based on the procedure described in section 2. It presents the document title and website link. The last column shows the abbreviations for each document that we assigned in the process of material selection.

Table 7: Additionally consulted background reports

Title	Link	Document Code
A digital future for Europe	https://www.consilium.europa.eu/en/policies/a-digital-future-for-europe/	PT01
Better access to e-evidence to fight crime	https://www.consilium.europa.eu/en/policies/e-evidence/	PT02
Cybersecurity: how the EU tackles cyber threats	https://www.consilium.europa.eu/en/policies/cybersecurity/	PT03
Data protection in the EU	https://www.consilium.europa.eu/en/policies/data-protection-reform/	PT04
Digital finance	https://www.consilium.europa.eu/en/policies/digital-finance/	PT05
Audiovisual media services	https://www.consilium.europa.eu/en/policies/audiovisual-media/	PT11
Common consolidated corporate tax base	https://www.consilium.europa.eu/en/policies/ccctb/	PT14
Digital taxation	https://www.consilium.europa.eu/en/policies/digital-taxation/	PT15
EU space policy	https://www.consilium.europa.eu/en/policies/eu-space-programme/	PT16