Global Digital Regulatory Outlook 2023

Policy and regulation to spur digital transformation

Global Digital Regulatory Outlook 2023

Policy and regulation to spur digital transformation

Acknowledgements

Disclaimer

The designations employed and the presentation of the material in this publication do not imply the expression of any opinion whatsoever on the part of ITU and of the Secretariat of the ITU concerning the legal status of any country, territory, city or area or of its authorities, or concerning the delimitation of its frontiers or boundaries.

The mention of specific companies or of certain manufacturers' products does not imply that they are endorsed or recommended by ITU in preference to others of a similar nature that are not mentioned. Errors and omissions excepted, the names of proprietary products are distinguished by initial capital letters.

All reasonable precautions have been taken by ITU to verify the information contained in this publication. However, the published material is being distributed without warranty of any kind, either expressed or implied. The responsibility for the interpretation and use of the material lies with the reader. The opinions, findings and conclusions expressed in this publication do not necessarily reflect the views of ITU or its membership.

Please consider the environment before printing this report.

Foreword

The Global Digital Regulatory Outlook 2023 benchmarks regulatory progress across 193 countries worldwide, building on the successful track record of the first three editions. This new analysis is the go-to reference for regulators and policy-makers seeking to understand a fast-moving landscape – and shape regulatory change that will benefit all in the quest for digital transformation. Almost a third of humanity remains unconnected – a sober reminder of the work that lies ahead.

Since the first edition of the Global ICT Regulatory Outlook in 2017, much has changed at the global level: the COVID-19 pandemic, increasingly urgent challenges linked to climate change, and economic and geopolitical turmoil. Against this shifting backdrop, the Global Digital Regulatory Outlook 2023 takes a close look at trends, tensions, and possible solutions and strategies to some of the more daunting – and continually evolving – challenges confronting regulators and policy-makers today. A number of regulatory issues are growing in importance – competition in digital markets, artificial intelligence, online financial services to name a few. This year's edition invites thinking and debate on those issues to help evolve regulatory approaches suited to the unique challenges they represent.

In addition, the Global Digital Regulatory Outlook 2023 unveils the latest in its suite of highly specialized tools: a unified framework for assessing the state of readiness of national policy, legal and governance frameworks for digital transformation, while supporting national ICT regulators in evidence-based decision-making. The unified framework is based on the tried-and-tested G5 Benchmark and the ICT Regulatory Tracker with which we are all familiar.

I highly recommend this report to all of us concerned with policy and practice that will help pave the way to meaningful connectivity and inclusion – and ultimately to digital transformation that benefits all.

Dr. Cosmas Luckyson Zavazava
Director, Telecommunication Development Bureau (BDT)
International Telecommunication union (ITU)

Table of contents

v

List of figures and boxes

Acronyms

ACCC	Australian Competition and Consumer Commission
ADEME	French Agency for Ecological Transition
AfCFTA	African Continental Free Trade Area
AI	Artificial Intelligence
ARCEP	France's Electronic Communications, Postal and Print Media Distribution Regulatory Authority
ASAT	Anti-Satellite Weapons
ATC	American Tower Corporation
AU	African Union
BEREC	Body of European Regulators of Electronic Communications
CAFDO	Communauté Afrique Francophone des Données
CERT	Computer Emergency Response Team
CFTC	Commodity Futures Trading Commission
CGAP	Consultative Group to Assist the Poor
CIGI	Centre for International Governance Innovation
CIS	Commonwealth of Independent States
COP	Conference of the Parties
CSEA	Centre for the Study of African Economies
CSR	Corporate social responsibility
DEA	Digital Economy Agreement
DeFi	Decentralised finance
DLT	Distributed ledger technology
EBA	European Banking Authority
EECC	European Electronic Communications Code
ESG	Environmental, social and governance
ESMA	European Securities and Markets Authority
EU	European Union
EWS	Early Warning System
FCC	Federal Communications Commission
FTC	Federal Trade Commission
GATS	General Agreement on Trade in Services

(continued)

GB	Gigabyte
GDP	Gross Domestic Product
GDPR	General Data Protection Regulation
GGDP	Green Gross Domestic Product
GHG	Greenhouse Gas
GPI	Genuine Progress Indicator
GSR	Global Symposium for Regulators
HDI	Human Development Index
HPI	Happy Planet Index
IADC	Inter-Agency Space Debris Organisation Committee
ICASA	Independent Communications Authority of South Africa
ICT	Information and Communication Technology
IDOTEL	Dominican Institute of Telecommunications (Dominican Republic)
IF	Inclusive Framework on Base Erosion and Profit Shifting
IFT	Instituto Federal de Telecomunicaciones (Mexico)
ILO	International Labour Organization
IoT	Internet of Things
ISP	Internet Service Provider
IT	Information Technology
ITIF	Information Technology & Innovation Foundation
ITU	International Telecommunication Union
JSI	Joint Initiative on E-commerce
LDC	Least Developed Country
LLDC	Landlocked Least Developed Country
M&E	Monitoring and Evaluation
MAU	Monthly active users
MeitY	Ministry of Electronics and Information Technology, Government of India
MEPs	Members of the European Parliament
MICT	Ministry of ICT Innovation and Youth Affairs of Kenya
ML	Machine learning
MNE	Multinational Enterprise

(continued)

NFTs	Non-fungible tokens
NRA	National Regulatory Authority
LDC	Least Developed Country
OECD	Organisation for Economic Co-operation and Development
PROFECO	Procuraduría Federal del Consumidor (Mexico)
SDGs	Sustainable Development Goals
SEC	Securities and Exchange Commission
SISMATE	Emergency Early Warning Messaging System (Peru)
SME	Small- and medium-sized enterprise
SMP	Significant Market Power
SMS	Short Messaging Service
TCRA	Tanzania Communications Regulatory Authority
TRIPS	Trade-Related Aspects of Intellectual Property Rights
UN	United Nations
UNFCCC	United Nations Framework Convention on Climate Change
UNOOSA	United Nations Office for Outer Space Affairs
USD	United States Dollar
VoIP	Voice over Internet Protocol
WIPO	World Intellectual Property Organization
WTO	World Trade Organization

Summary and key messages

Connecting everyone, everywhere remains the absolute priority.

2.7 billion people worldwide remain unconnected. The digital divide persists in rural areas, across income, gender and age groups – and new, deep divides have emerged for vulnerable groups. Change is needed in policy and regulation. Iteration, trouble-shooting and incremental improvement are decisive in policy implementation – without this agile approach, one-third of the world's people will be left behind.

Five tensions will characterize policy and regulation.

The new equilibrium will require a systems thinking approach to leverage the connection between digital technologies, public goods and economic activities, and to move towards lean governance models. The five tensions set out below frame policy and regulatory models into the future:

- *Tension 1: Fast vs slow regulation*. Market players expect both flexibility *and* predictability – flexibility when new products are on the way to markets, and predictability when investment plans are made. Hence regulatory processes will continue to evolve at several speeds.
- *Tension 2: Hardwired vs 'soft-wired' regulation*. Should we regulate new issues using old methods? Is formal, hardwired regulation better than self-regulatory practices? Decentralized regulatory models will likely thrive in the digital environment – sitting closer to market players and tailored to their business models and goals.
- *Tension 3: The watchdog vs the ecosystem builder approach*. Next-generation digital regulators will be both community builders *and* facilitators of access to inclusive digital opportunities for businesses and users. They will need to rebalance their portfolios, fulfilling several roles at the same time.
- *Tension 4: Sustainability vs economic growth*. The traditional GDP approach will fade while sustainability and energy efficiency will grow in importance – underlined by rising adoption of ESG measures and matching private sector CSR initiatives. Shifting to the broader focus will be slow, exacerbating divides and failing to reshape policy in the short term in developing and least developed countries.
- *Tension 5: National vs global regulation*. Governments need robust legal instruments – both national and international – to navigate the digital transformation. A global framework may be the only way to address issues such as two-sided markets, global digital platforms, digital currencies, privacy, ethics, transparency and taxation. New international and regional treaties will need to set boundaries, reframe rules and adapt them to digital markets.

These five policy and regulatory strategies will drive digital transformation.

- *Strategy 1: Build ambidextrous leadership*. When the only constant is change, sound policy leadership is imperative. Policy and regulatory leaders must blend traditional and experimental approaches, combining rule-making and enforcement. Policy leadership embraces ambiguity and uncertainty, with a growth mindset and openness to experimental techniques such as sandboxing, policy labs and high-level frameworks for experimentation.
- *Strategy 2: Bridge silos and break through insularity*. Silos are still common in national institutions and policy implementation – but the global pandemic has shown the need for a whole-of-government approach. 60 per cent of ICT regulators now collaborate beyond their traditional sector with ministries of education, health and government services. In

70 per cent of countries, coordination and collaboration have increased between the ICT regulator and the national agency driving digital transformation.

- *Strategy 3: Develop a common language.* Consultation is core to effective, pro-market regulation. While public consultation on regulatory decisions is today commonplace in 80 per cent of countries, only a fifth use public consultations to guide regulatory decision-making. Most regulators still need to adopt a thorough, evidence-based approach to emerging issues, and to far-reaching regulatory decisions.

- *Strategy 4: Reframe and operationalize policy agendas.* How to plan ahead through uncertainty and ambiguity? Crafting a vision must balance needs and wants, translating them into goals while weighing the required resources. More than half of countries have digital strategies covering multiple economic sectors, underpinning economic recovery. However, most countries still need to define digital policy priorities and implementation frameworks.

- *Strategy 5: Skill up, and up again.* In the 'new normal', speed of learning provides a competitive edge for national decision-makers and regulators. Regulatory expertise needs to be developed continuously to integrate new technologies, competencies and skills – and to allow for data- and evidence-based decision-making.

Gen 5 is the baseline for agile, lean policy and regulation

- Gen 5 has a clear focus on digital, on cross-sector instruments, marks a shift from rules to principle-based regulation, offers innovative regulatory options, calls for regional integration of national regulatory approaches, heralds a move from 'regulation as remedy' towards managing harms to consumers, markets and governments – and challenges regulators to focus on an ecosystem approach.

- Gen 5 reflects <u>five core elements</u> that define national readiness for digital transformation. These elements are policy implementation, governance, regulatory reform, policy implementation and policy culture.

- Gen 5 is based on three decades of experience – of codified telecom and digital regulation best practice that form a gold standard for lean digital governance.

The state of digital regulation worldwide – we need a more strategic and concerted approach

New overlapping emergencies call for a more strategic, systemic and concerted approach to digital policy if we are to enhance public services, build long-term economic resilience, and spearhead innovation and social entrepreneurship over the mid- to long term.

Globally, we would score 5 out of 10 in 2022 as we quantify the readiness of national frameworks for digital transformation. Both developed and developing countries have come a long way, but the work isn't complete. Vast gaps separate the most and the least advanced countries in their digital transformation.

Nine issues on every regulator's radar screen

1.   Challenges in Internet regulation

- Neither *ex-ante* or *ex-post* regulation effectively addresses Internet-related issues alone.
- How can individual national regulators regulate platforms with global reach?
- The speed of tech evolution will continue to outpace lawmakers.
- Many digital technologies bridge historical silos, calling for profound collaboration between regulators.

- Does regulation consider issues like anonymity, identity and privacy from technical, efficiency or rights perspectives?
- Who will regulate the metaverse, or job substitution of computers for human workers, ICTs' carbon emissions or the 'right to be forgotten'?

2. Cybersecurity

Telecom/ICT regulators' mandates differ and there is no one-size-fits-all solution. It is important to highlight initiatives that ensure cybersecurity governance by operators, foster best practice, diagnose incidents, promote awareness, share information – and protect critical infrastructure.

3. Is it possible to regulate artificial intelligence (AI)?

Popular applications of AI include facial recognition systems, self-driving cars, neural networks, photo or object identification, translation and search software, and text chatbots. Regulators need to monitor and consider the implications – present and future – of this fast-moving area. Guidance on AI development include the European Commission's Communication on AI[1] and Ethics Guidelines for Trustworthy AI[2]; the OECD's Principles for AI[3] ; and the UNESCO Recommendation on the Ethics of Artificial Intelligence.[4]

4. Online financial services – growing calls to regulate cryptocurrencies

Crypto-currency regulation is challenging because of complexity, anonymity, and online ubiquity across borders. Nascent regulatory approaches build on the tradition of banking regulations. Regulations could extend these and include: 1) defining asset classes; 2) licenses to operate within a certain territory (difficult to enforce); 3) minimum capital and liquidity requirements; 4) maximum exposure, gearing or leverage and risk limits; 5) customer deposit or customer protection guarantees, including protection against fraud.

5. ICT regulatory sandboxing for innovation

Regulatory sandboxes are resource intensive, can increase risk for the regulator (in terms of competition and collusion) and can be difficult to scale to meet the demand. These risks need to be constantly monitored and considered from conceptualization, operationalization, as well as at reporting on and exiting the sandbox. ICT regulators in Colombia, Mexico, France, Thailand and Saudi Arabia have set up sandboxes as an alternative to traditional initiatives.

6. Can regulation support green *and* digital transitions?

Higher regulatory pressure to report climate data is needed to cement digital transformation and a company's green innovation. NRAs can work with public bodies' in efforts to increase available data and support harmonizing standards and methodologies.

---

[1] European Commission. 2018. Communication Artificial Intelligence for Europe.
[2] European Commission. 2019. Ethics Guidelines for Trustworthy AI.
[3] OECD. 2019. Principles for AI.
[4] UNESCO. 2021. Recommendation on the Ethics of Artificial Intelligence.

7. e-Waste

Only 40 per cent of countries have a national policy, legislation or regulation governing the management of e-waste[5], with very few of these are legally binding or even in the implementation phase. A strong national framework where ICT regulation meets environmental management regulation is imperative in order to lay out the legal obligations which will help boost e-waste collection and recycling and hold certain actors in the electronics sector accountable for the environmental impact of their businesses. Government ministries and agencies (including for ICTs and the environment) and regulators need to work together to improve e-waste compliance frameworks and practices.

8. Early warning systems

Early warning systems have been largely unregulated. In 2018, the EU passed a new law stipulating each Member State should have early warning systems that send alerts via mobile networks. This approach has been effective, with all European countries responding. A clear regulatory framework, appropriate incentives and financial alignment to funding programmes accelerate drastically the roll-out of early warning systems, at a reasonable cost, and with massive impact on public safety.

9. Regulating the use of earth orbits by objects

Some best practice, studies, standards and rules exist. The Radio Regulations manage the spectrum and its use from an orbital location and prevent harmful signal interference. ITU Recommendation ITU-R S.1003.2 (12/2010) addresses environmental protection of the geostationary-satellite orbit, the GSO 'graveyard' and limiting debris in general. The United Nations Office for Outer Space Affairs (UNOOSA) maintains a register of space objects within limits – it involves non-mandatory registration. Soft law, sharing practices and standards will not be enough to ensure space sustainable activity. Even though needed sooner rather than later, the development of formal regulation will take time and will be costly.

---

[5] bid: https://www.itu.int/en/ITU-D/Environment/Pages/Toolbox/Global-Ewaste-Monitors.aspx

1   Introduction

We first presented the 'generations of regulation' concept at the Global Symposium for Regulators (GSR) in 2014. At that time, it was an experiment and an opportunity to codify two decades of work of the International Telecommunication Union (ITU) in telecom/ICT policy and regulation – with a view to equipping national decision-makers with new evidence-based tools. Developing countries were voicing the need for a simple, powerful framework that would lend practical support to their strategic and day-to-day work. Less than a decade later, this 'generations of regulation' model has become *the* go-to model in the international arena as the best way to make sense of – and track the progress of – how policies and legal frameworks in the ICT sector have evolved. Importantly, the model now tracks the degree to which economies and societies of the 193 ITU Member States are readying themselves for and embracing the challenges and opportunities of digital transformation (see Box 1).

Today, increasing numbers of regulators across all regions are applying the model in their decisions to leverage the potential of telecom and digital markets for responsible and sustainable development.

As with the three previous editions of the Global ICT Regulatory Outlook, the purpose of the Global Digital Regulatory Outlook 2023 is to invite reflection, open new perspectives on policy and decision-making in digital markets – and to challenge mainstream thinking. While recognized best practice remains at the heart of many regulatory solutions, there is now a growing movement towards more agile, localized and iterative policy-making and governance – indeed this movement now defines the conversation. This shift in thinking is both difficult and urgent, and calls upon us to consider with some boldness, the tensions, strategies, transitions, issues and solutions that go the heart of how we harness digital technologies – and how they can make for economies and societies that are inclusive, sustainable and successful.

This reflection does not offer quick solutions or miracle remedies. It does however, offer an informed consideration of the larger context – one in which the available options are often imperfect – and especially so, against the backdrop of a gloomy global economic and geopolitical situation where the only choices facing national decision-makers are outstandingly difficult. The clear-eyed view of current and emerging trends in digital policy and regulation which stands at the heart of this document, is backed by rich, unique data, solid evidence and a sound analytical framework. This framework has been refined, integrated and reinforced with new tools, and is continually expanding to provide a lens on evolving issues and new approaches.

Box 1: The elements of the generations of regulation framework in 2023

- The **Generations of regulation** provide a high-level conceptual framework to understand trends and track progress in the development of telecom, ICT and digital policy, legal and governance frameworks. Generations 1 through 4 track the maturity of telecom markets. Generation 5 (Gen 5) encompasses the evolution of national digital markets, from limited to transitioning and advanced to leading.

- **Collaborative digital regulation**, or **Gen 5**, provides the baseline for effective policy, regulation and governance as digital transformation gathers pace. Gen 5 reframes policy and regulation to accelerate digital development across sectors, strengthen markets and improve the long-term economic and development outlook.

- The **ICT Regulatory Tracker** is a conceptually sound, statistically coherent and robust data-based tool for monitoring the changes taking place in the ICT environment. It allows associating countries to Generations 1 through 4 and supports national regulators and decision-makers in pinpointing areas for further reforms.

- The **G5 Benchmark** (Benchmark of Fifth Generation Collaborative Digital Regulation) is a data-based tool featuring an extensive collaborative governance component and a focus on legal instruments for digital enablers. The G5 Benchmark was designed based on GSR19 Best Practice Guidelines and together with the ICT Regulatory Tracker, serves as a compass for regulators on their journey of digital transformation, helping establish roadmaps towards regulatory excellence and a thriving digital economy.

- A new **unified data-informed framework and thematic benchmarks** blends the well-established tools for assessing discrete areas of the enabling environment for digital transformation, the ICT Regulatory Tracker and the G5 Benchmark. This 'unified framework' has been designed to help national ICT regulators and decision-makers understand the complex, fast-evolving trends in digital policy, regulation and governance at the global, regional and national level, compare themselves with their peers in key areas and build tailored roadmaps for future reforms. The new set of thematic benchmarks are at hand to support evidence-based sense making, strategizing and decision-making. The new unified framework and benchmarks have been applied in the following chapters to assess the global state of readiness of national policy, legal and governance frameworks for digital transformation.

- The **Global ICT Regulatory Outlook** series launched in 2017 shares unique, focused research and offers both evidence and practical advice to support regulators who have embarked on their journey to digital transformation, leveraging collaborative digital regulation. The evolving focus of the series led to rebranding it, as from this edition, into the Global Digital Regulatory Outlook. The analysis is built on ITU's unique set of benchmarks and evidence-informed frameworks, demonstrating how they can be leveraged by national decision-makers in their strategic and day-to-day work.

Source: ITU.

As digital transformation unfolds against the backdrop of global economic and geopolitical turmoil, there are more questions than answers. Is digital transformation on track to empower everyone, everywhere or do new divides threaten digital development for those most in need? How can diverging agendas of public and private stakeholders align? Can digital policies accelerate the transformation and make it more responsible, sustainable and inclusive? New cues have started to emerge.

2   Looking back, the new normal and where to from here?

Transition has characterized the development of communication technologies since telecom sector reform in the early 1990s – voice to data, fixed to mobile, monopoly to competition. Telecoms is present in virtually all sectors, and underpins today's global digital economy – a digital neural network connecting people, businesses and governments across regions. Has it been a smooth ride? Quite the opposite – but telecom and digital markets have navigated through all the change, from new technologies, to economic downturns, to policy processes, to a global pandemic.

Despite the phenomenal growth of digital, it is yet to deliver its full promise.

A clarion call from 40 years ago – the Maitland Report

In 1985, the *Maitland Report*[1] evaluated the benefits of telecommunications for the first time and advocated for 'remarkable new technologies'[2] and the connectivity they bring as a political priority *for all countries*. The report highlighted gaps in policy, investment and institutional capacity in developing countries, though the work did not focus on cellular mobile technologies and the Internet at that time. Sir Donald Maitland refers to 'the missing link' across technologies and development – and his implication that not sufficient progress is being made – his 'Plus ça change'[3] – still resonates today as billions of people remain unconnected.

A decade of transition towards liberalization

The 1997 General Agreement on Trade in Services (GATS) kicked off an irreversible process of policy and business transformation in the telecom sector. The Basic Telecommunications Agreement[4] facilitated the transition from state-owned to liberalized telecom sector, open competition and good governance. The agreement triggered a global first wave of regulatory reform leading to some 80 national incumbents moving into private hands and a ten-fold increase in the number of telecom regulators globally in a decade.[5] The number of people using fixed and mobile telephony went from under 1 to over 4 billion, and Internet use grew at a double-digit rate.[6] As challenging as the bursting of the dot.com bubble was for tech businesses globally, it did not slow down progress in connecting new users to mobile and the Internet, though mainly in developed countries.

---

[1]   ITU. 1985. Final Report from the Independent Commission for World Wide Telecommunications Development by Sir Donald Maitland GCMG (also known as the "The Missing Link"): https://www.itu.int/en/history/Pages/MaitlandReport.aspx..
[2]   ANIMA. 2005. Maitland+20: Fixing the Missing Link, An interview with Sir Donald Maitland.
[3]   "Plus ça change, plus c'est la même chose" (French) can be translated as "The more things change, the more they remain the same".
[4]   Through the adoption of the Fourth Protocol To The General Agreement On Trade In Services, 1997.
[5]   ITU. 2008. https://www.wto.org/english/tratop_e/serv_e/telecom_e/sym_feb08_e/schorr_e.pdf.
[6]   ITU. 2008. https://www.wto.org/english/tratop_e/serv_e/telecom_e/sym_feb08_e/schorr_e.pdf.

The smartphone ushers in profound change

The birth of the smartphone in 2007, a decade after the GATS Agreement, marked a new crossroads. This single innovation boosted global connectivity, creating efficiencies and shaping social and economic behaviours while smartphone-based apps and social media created an array of issues for consumers and regulators. Digital platform regulation, cybersecurity and privacy remain moving targets for national decision-makers and increasingly are topics for regional regulatory cooperation. The transition towards mobile powerhouse smartphones is still ongoing. What was at first a hardware revolution has given rise to a new generation of business models, content providers – and has powered the gig economy, offering new opportunities and reach but where temporary employment, short-term or zero hour labour contracts dominate.[7]

Growing recognition of digital's role in national economies

Change and challenge have characterized the industry and its development – from telecom to digital markets, through prosperity, crisis, stability and disruption. More often than not, policy and regulatory initiatives have been catching up with markets rather than leading the way. Change has been constant on both fronts and the quest for equilibrium has been relentless – while the impact of economic and social dividends have grown enormously. The 2008 global financial crisis crowded out private investment in the short term but propelled broadband connectivity to the top of government agendas in all regions, unlocking both unprecedented state investment and market incentives for telecom players. Since then policy levers have targeted infrastructure challenges from investment to digital inclusion to innovation. Gradually, the link between development goals and telecom policies has matured, recognizing the contribution of digital technologies to national economies (see Figure 1 below). Universal access and service policies – the bedrock of telecom reform – have been transformed into cross-sector infrastructure policy with an increasing number of countries now adopting a national broadband strategy.

Figure 1: Changing policy focus

Universal access and service
- Obligations to fixed, mobile and Internet providers
- Universal Service Funds

Broadband infrastructure investment
- Broadband stimulus plans
- ICT Master plans
- NGN/NGA strategies

Digital transformation
- Digitization, automation
- Digital economy
- Digital development
- Smart cities

Digital enablers
- 5G, 6G
- Internet of Things
- Artificial intelligence
- Digital assets

Source: ITU.

---

[7] ITU. 2017. ICT-centric economic growth, innovation and job creation. https://www.itu.int/dms_pub/itu-d/opb/gen/D-GEN-ICT_SDGS.01-2017-PDF-E.pdf..

COVID has reframed the picture

The global pandemic has triggered market disruption as well as unprecedented policy responses, with native digital agendas leading the way to economic recovery[8]. This new generation of policy narratives has reframed the surge of technologies and business models in the new normal, matching markets with future-facing legal frameworks, and shifting focus back to people and long-term development. Native digital agendas, such as the European Commission Digital Agenda for Europe and the Kenya (see Box 5) and Malaysia Digital Economy Blueprints, cover multiple economic sectors, setting holistic development and economic goals and identifying fast-track implementation mechanisms.

The focus of regulation has shifted from market players to networks to services – and has widened to address risk as well as benefit. Regulatory authorities have grown stronger, more autonomous and with an expanded mandate, moving up the regulatory ladder. Markets, in turn, have become more open, competitive and innovative – transforming livelihoods, communities and economies for two-thirds of people worldwide.[9]

Are we on track?

If such remarkable progress has been made in just three decades, digital policies and regulatory reform can support stakeholders across governments, private sector and the development community in achieving real digital development across all countries – for all people everywhere by 2030. But are we on track for reaching meaningful connectivity goals?

> *For the purposes of the analysis here,*
> - ***Digital development*** *refers to social and economic development aligned with the Sustainable Development Goals (SDGs) and driven by digital technologies, solutions, services and innovations.*
> - ***Digital transformation*** *refers to the integration of digital technology into all areas of society, fundamentally changing how it operates and delivers value to its citizens.*
>
> *Digital transformation is the journey. Digital development concerns the tools that bring about and measure the transition.*

2.1 Connecting everyone, everywhere is our absolute priority – no ifs, no buts

Digital technologies have underpinned the progress towards national economic development goals over the past two decades. *Fixed broadband* has driven an increase in GDP of 0.77 per cent for every 10 per cent penetration increase on average,[10] with wealthier, more developed countries benefitting twice as much from digitization and increased Internet access. *Mobile broadband* however, has had a greater impact, increasing GDP by over 1.5 per cent for every 10 per cent penetration increase on average and with developing countries enjoying higher

---

[8] See: the EU 2030 Policy Programme "Path to the Digital Decade", the Kenya Digital Economy Blueprint and the Malaysia Digital Economy Blueprint. Broadband plans and telecom sector-specific connectivity strategies do not qualify as native digital strategies.

[9] ITU. Individuals using the Internet 2022.

[10] Between 2010 and 2017, corresponding to an increase of 10% in fixed broadband penetration, see ITU: How broadband, digitization and ICT regulation impact the global economy.

impact than countries with developed economies.[11] Sadly, least developed countries (LDCs) have been less able to benefit from digital technologies as they may lack the critical mass of broadband infrastructure and people connected to digital services.

2.7 billion people worldwide remain unconnected

The digital world remains a remote prospect for 2.7 billion people worldwide – and those who have *never* connected online are disproportionately concentrated in developing and least developed countries.[12] The digital divide stubbornly persists in rural areas, across income, gender and age groups (see Box 2 below). New, deep divides have emerged for vulnerable groups such as people with disabilities, rural and low-income populations, and vulnerable and minority groups. Even among those connected, not all can afford to be 'always on' nor can they rely on digital technologies for work, education and access to public services.

Box 2: Digital divides between developed and developing countries

- Low Internet use: Two-thirds of the world's population use the Internet, but 2.7 billion people remain offline. The unconnected are disproportionately concentrated in developing and least developed countries (LDCs).
- Gender divide: The regions with the highest Internet use also have the highest gender parity scores. LDCs and landlocked developing countries (LLDCs) as well as Africa, however, show a trend of low Internet use and a low gender parity score, with hardly any progress towards gender parity over the last three years.
- Urban-rural divide: Worldwide, 82 per cent of urban dwellers are using the Internet in 2022. That percentage is 1.8 times as high as the percentage of Internet users in rural areas.
- Affordability: A wide gap remains between high-income economies and the rest of the world. The lack of affordability continues to be a key barrier to Internet access particularly in low-income economies, with median prices paid for a mobile broadband basket in high-income economies costing nearly 10 times less than in lower-middle-income economies and nearly 30 times less than as in low-income economies, in relative terms.
- Economic impact: LDCs have been unable to unleash the multiplier effect of broadband on the economy failing to build critical mass of users, which can drive up to 2 per cent increase in GDP per 10 per cent increase in Internet penetration.

Source: ITU[1].

_____

[1]   ITU. How broadband, digitization and ICT regulation impact the global economy. 2021. and Measuring digital development: Facts and Figures 2022

A citizen's right – meaningful connectivity

Critical progress is yet to be made towards inclusive digital development for all people, everywhere, in the midst of lasting global uncertainty and market disruption. In the UN's Decade of Action to achieve the Sustainable Development Goals (SDGs), universal meaningful connectivity has been elevated to a policy imperative. Although it is unlikely that this is achieved in all regions by 2030, it remains decisive in generating progress towards the achievement of all of the SDGs. Meaningful connectivity and inclusion are increasingly regarded as a citizen's right – and a responsibility for national decision-makers.

---

[11]   Between 2010 and 2017, corresponding to an increase of 10% in mobile broadband penetration, see ITU: How broadband, digitization and ICT regulation impact the global economy.
[12]   ITU. Measuring Digital Development: Facts and Figures 2022.

Digital technologies have enabled synergies across the board – driving progress well beyond telecom and digital markets. Such synergies include maintaining business continuity, the creation of responsible entrepreneurship opportunities, the enabling of continuous learning – and the management and control of nothing less than a global pandemic.

Urgent warnings – change is needed in policy and regulation

Recent global disruptions – COVID-19, the threat to global peace, the climate emergency – have sent warnings about the need to overhaul both policy and the regulatory toolbox. Those warnings have been getting louder and more urgent against a backdrop of economic and geopolitical turmoil. While many urgent challenges have been handled through *ad hoc* approaches to digital policy and regulation,[13] systemic improvement is now needed – of national governance and resilient, legal frameworks.

The past three years since the 2020 edition of the Global ICT Regulatory Outlook have demonstrated that iteration, trouble-shooting and incremental improvement are decisive in policy implementation to amplify impact and bridge inclusion gaps at all levels. Without this agile approach, progress can be jeopardized, and national digital ambitions can be left behind – along with one-third of the world's people.[14]

---

[13]   ITU. Global Network Resiliency Platform (Reg4Covid). https://reg4covid.itu.int/.
[14]   UNDP. 2002. Revision of World Population Prospects. https://population.un.org/wpp/.

3   Through tensions to equilibrium

We find ourselves in a shifting landscape. In the midst of geopolitical turmoil and as the global pandemic recedes, we need urgently to redefine policy priorities and stakeholder roles – and identify new tools. Tensions persist between established and emerging approaches. New strategies need to prove themselves while old certainties may not stay the course – and new norms are yet to form.

This transition to new governance, policy and decision-making patterns will take time and are complicated by new challenges. Even as a new equilibrium takes shape however, tensions persist between established and emerging approaches.

Below, we explore five such tensions – laying out the underlying trend and proposing how each may play out in the future. Regulators and policy-makers will need to engage with each other as they seek to advance their digital development agendas.

3.1   Tension 1: Fast vs slow regulation – regulation needs to function at different speeds

During times of uncertainty, many players favour stability over change. Slow decision-making allows us to address issues from several perspectives, studying their evolution, taking into account historic evidence, and analysing the impact of reforms. The predictability of regulatory frameworks has been paramount in boosting investment and enhancing consumer benefits through stable times.

Innovation and investment…

Innovation is a game-changer, moving rapidly and disrupting certainties. But it can lead the way out of economic conundrums. And while innovation can create new options, it also poses a risk for governments as well as for financiers. Driving both innovation *and* investment is a new, thorny task that regulators will need to master in facilitating market recovery after the pandemic. Adapting policies in the new normal requires change underpinned by processes that are both fast *and* slow. To reference the oft-quoted words of the Swiss Health Minister during the COVID-19 crisis: "We need to move forward as fast as possible and as slowly as necessary".[15]

But can regulation be fast and slow, at the same time?

We need both fast *and* slow regulation in building a sound and supportive ecosystem across economic sectors, and across borders. Global conditions favour the exploration of new, faster avenues in traditional areas of regulation – such avenues allow safe experimental space to test new technologies and business models, better understand their potential and outline alternatives both by established market leaders and start-ups. Rapid, experimental, iterative regulation can allow new products and services to hit the ground running, can enable the refinement of regulatory tools 'as we go', while matching the speed of technology and market innovation. Such speed of response brings with it the need for agility. Agility improves regulatory outcomes across the board – for consumers, businesses and governments – and builds in resilience to new challenges. In the new normal, regulation takes practice and incremental

---

[15]   Alain Berset, Member of the Swiss Federal Council summarized his strategy for fighting the pandemic with the words: 'Nous souhaitons agir aussi vite que possible, mais aussi lentement que nécessaire' (16 April 2020).

improvement to keep the pulse of markets in check. The skillset needed for agile regulatory response is more diverse and the resources more intense, meaning that additional regulatory capacity might be needed.

There remains of course an important role for 'slow' regulation – more structured and predictable regulation has certainly not fallen out of fashion in the midst of transformation in markets and public governance. Long-term investment decisions and high-stake market initiatives require long-term policy frameworks along with stable and consistent legal instruments. With the massive financial cost of new high-capacity connectivity and the critical social imperatives at stake, clarity and predictability will remain a tell-tale mark of digital regulation.

What's the trend?

Regulators are already setting out fast tracks for urgent decisions. For example, two-thirds of countries surveyed that enacted emergency regulatory measures during COVID-19 set out voluntary measures for network operator cooperation in enhancing connectivity, accessibility and affordability of digital services. A third mandated the provision of free services to customers by licensees while only one in 20 countries introduced measures to relax competition policy rules.[16] Decisions in key areas such as spectrum were forthcoming due to the surge in demand during the pandemic, in some cases, after over 10 years of regulatory processes. ICASA of South Africa, for example, issued spectrum licences to help lower data costs and add network capacity in the midst of the pandemic in 2020.[17] In direct response to public health imperatives during the pandemic, the Communications Authority of Kenya expedited the application procedure for type approval of certain equipment to enable entities to introduce digital health technologies more quickly.[18]

What's the outlook?

Market players expect both flexibility *and* predictability – flexibility when new products or services are on the way to markets, and predictability when investment plans are made. Hence regulatory processes will continue to evolve at several speeds. Some authorities may take some years to adopt a new law while in the interim introducing versatile, modular rules as new challenges arise or markets run out of steam.

3.2   Tension 2: Hardwired vs 'soft-wired' regulation

Binding legal frameworks have long been the bedrock of traditional regulation. Key legal pieces such as ICT laws, competition policies and licensing regimes have structured the space for private initiative and public-private partnerships since telecom markets began coming of age. Formal, centrally governed instruments have helped shape the evolution of markets and delivered connectivity to 4.9 billion people worldwide.[19]

---

[16]   ITU. 2020. Pandemic in the Internet Age and REG4COVID.
[17]   Reuters. 2022. The decision has now faced legal challenge by Telkom SA, the national incumbent.
[18]   CA. Public Notice on Introduction of Simplified Type Acceptance Procedure during the COVID-19 Pandemic Period. https://www.ca.go.ke/wp-content/uploads/2020/05/Public-Notice-on-Introduction-of-Simplified-Type-Acceptance-Procedure-during-the-Covid-19-Pandemic-Period.pdf.
[19]   ITU. Facts and Figures 2021.

Light touch tools

Following the pandemic however, the wider use of softer, light-touch regulatory tools such as self- and co-regulation will help address issues where traditional regulation is not appropriate. Such issues include digital content moderation, information verification on social media and the re-use of subscriber data, tuning artificial intelligence algorithms, and the taxation of global digital platforms. A range of thorny issues lend themselves to codes of conduct, corporate social responsibility (CSR) policies or other voluntary opt-in regulatory models more readily – and with a more realistic outlook for enforcement, driven by continuing collaboration with market players. Augmenting opt-in models, for example using codes of conduct with enforceable clauses, or soft-wired ownership of complementary regulatory tools – these can become fully fledged alternatives to traditional regulatory governance in some areas. Such instruments are usually driven by national interests although their international alignment benefits all stakeholders globally. Codes of conduct also help bridge gaps between regulation in traditionally separate sectors that have converged, enhancing flexibility and agile regulatory responses.

What's the trend?

Codes of practice or conduct have become increasingly popular in managing harmful impacts of some digital services – as well as the increasingly complex and opaque business models of digital platforms. Over a quarter of countries worldwide have crafted regulatory codes of conduct in at least one area, by 2022.[20] A recent open consultation by ACCC, the Australian competition and consumer regulator, has identified reforms to make the online environment fairer for businesses and safer for consumers. Some include codes of practice that establish clear standards of acceptable conduct not only for digital platforms but for other players in sectors such as rail and agriculture.[21] The development of such codes requires close consultation with platforms, business users and consumer and industry organizations. In Australia, several existing and proposed codes relate to specific issues and conduct by digital platforms. One example is the 2021 News Media Bargaining Code which did much to strengthen the role of local journalism, triggering Google and Meta to reach voluntary commercial deals with news media businesses.

Some digital technology companies have sought to tear down the barriers excluding billions of people from accessing and productively harnessing digital technology,[22] effectively working towards regulatory objectives outside formal regulatory frameworks. The Digital Inclusion Benchmark has highlighted industries and companies that lead the way in fostering digital inclusion, triggering a race to the top across the digital sector, as well as holding underachieving companies to account. Telefónica has been acknowledged by some as the top global performer in terms of digital inclusion in 2021.[23] We should recognize however, that only a few of the large private global players can deploy projects that advance public policy objectives and provide digital public goods. Even then, the sustainability of such projects might be a challenge – for example Google Loon (expanding Internet connectivity with stratospheric balloons[24]) and Facebook Zero (waiving data charges for accessing Facebook on phones in collaboration

---

[20] 55 countries, according to analysis based on the <u>G5 Benchmark 2021</u>.
[21] ACCC. <u>Feedback sought on potential new rules for large digital platforms</u> (published 28 February 2022).
[22] World Benchmarking Alliance. <u>Digital Inclusion Benchmark</u>.
[23] World Benchmarking Alliance. <u>Country ranking 2021</u>.
[24] <u>Project Loon</u>.

with mobile and Internet providers[25]), both of which were discontinued after a few years of operation (Facebook Zero is still in operation in some African markets but local conditions vary considerably)[26].

What's the outlook?

Should we regulate new issues using methods deployed in the past? And should we consider formal, hardwired regulation better than self-regulatory practices and their emerging alternatives? Probably not. Unlike centralized regulation, co- and self-regulatory patterns can be distributed across the network or patchwork of digital market players – and be governed in a more decentralized manner, by each player. Such a decentralized regulatory model will likely thrive in the digital environment since it mimics the way technologies power markets through distributed networks. In this way, regulation sits closer to market players and is tailored to their business models and goals – with improved compliance and better positioned to deliver improved market and consumer outcomes.

3.3   Tension 3: The watchdog vs the ecosystem builder approach

The roles and mandates of regulatory authorities have evolved over the past three decades. Their importance as market problem-solvers has grown as telecom networks lay the foundation for digital ecosystems across economic sectors. From watchdogs to referees to stakeholder conveners and partners, their journey through the generations of regulation has mirrored that of market players and consumers firstly of telecom, then of digital services. Regulators have been constantly challenged by the speed of market innovation – and the learning curve has always been steep.

Divergent regulatory approaches have become intertwined in regulatory practices and cycles, setting the bar high for institutional resources and for the human capital of regulatory authorities.

- Scrutiny and regulatory enforcement are at the core of regulatory mandates and will remain of pivotal importance in digital markets. Structured rules and targeted obligations will level – to the extent possible – the new and fair playing field for digital markets, ensuring safe and meaningful online consumer experience.
- *Ex-post* regulation and sanctions for anti-competitive or unethical behaviours[27] will become more robust as jurisprudence builds up in new areas across digital. The importance of adequate enforcement and of the capacity of regulators continues to grow.
- In contrast, *ex-ante* regulation and anticipatory action by regulators remain important in areas where harm and social impact of digital services are greater – such as data privacy and child online protection – minimizing the negatives to individuals and business users. Such regulation relies on market evidence and a sound understanding of the long-term impact of reforms, while tapping into stakeholder expertise and expectations. Decision-making processes build on specialized technical expertise, requiring new soft skills and a new collaborative attitude.

---

[25] Techcrunch. 2010. Facebook Launches Zero, A Text-Only Mobile Site For Carriers, 16 February; The Wall Street Journal. 2022. Facebook Promised Poor Countries Free Internet. People Got Charged Anyway. 24 January.

[26] See Telecommunication Regulatory Authority of India (TRAI). 2016. Prohibition of discriminatory tariffs for data services regulations. Available ay https://trai.gov.in/sites/default/files/Regulation_Data_Service.pdf and Toussaint Nothias. 2022. Access granted: Facebook's free basics in Africa. SAGE Journals. Available at https://journals.sagepub.com/doi/full/10.1177/0163443719890530

[27] For example, European Network of Research Ethics Committees – EUREC. http://www.eurecnet.org/index .html..

- However, we need a different approach if we are to support innovation and ecosystem building in the digital transformation – a regulatory imperative that has taken on a new, stronger meaning since the COVID-19 pandemic. This will involve a wider spectrum of flexible, collaborative and imaginative measures – for example financial and non-financial incentives, mitigating measures, sandboxing and facilitating the market entry of greenfield, non-traditional players and start-ups. Such measures are better suited to foster new technologies and applications. While there will be boundaries for all breeds of player, regulatory approaches will need to be tailored with both market challengers and vulnerable consumer groups in mind.

Changing role as new regulatory imperatives take centre stage

The transition in the regulator's role is well under way. The expectation in the new normal is to elevate the mandates of telecom regulators to ecosystem builders for the digital economy – working across sectors, working hand-in-hand with policy-makers – the architects of digital futures – along with other regulators and national agencies, in a coordinated effort towards digital transformation. New regulatory imperatives take centre stage such as inclusiveness, openness and ethics. Technical expertise and academic research from a range of bodies – think tanks, scientific committees –increasingly inform rule-making and decision-making. The old norm of command-and-control with blanket obligations and rules is today ineffective – and actually *impedes* innovation and investment hampering regulators as they seek to uplift digital markets across the board.

What's the trend?

The number of national telecom regulators has grown from only 13 in 1990 to 165 three decades later. They have been central in determining the evolution of legal frameworks since the WTO Reference Paper[28] identified them as one of the pillars of sector development. In that time, their mandates have evolved and their decision and enforcement capacity has grown.

But the rise of digital has had a dual impact on traditional regulators:

- On one hand, the spread of digital has extended the core of telecom regulatory mandates to new areas. Today one-fifth of regulators globally have a mandate to oversee Internet content compared with a mere three just a decade ago,[29] though many lack the tools to enforce their decisions with regard to global players. Only one in 10 regulators used to be responsible for information technology (IT) issues while today, one in three regulators worldwide is active in that area, delving into issues such as cloud computing, digital platforms or the Internet of Things (IoT). Regulatory functions previously entrusted to ministries have also been increasingly transferred to regulators, with one-sixth of countries upgrading regulators' mandates to cover licensing and spectrum allocation issues over the last decade.[30]

- On the other hand, the influence of traditional telecom regulators has sometimes waned. Responsibilities for policy coordination and implementation have often been transferred to cross-sector agencies or to new digital regulators. Inter-agency collaboration has nevertheless built bridges across governments. Some 70 per cent of regulators and sector ministries have collaborated to support digital agencies, helping facilitate connectivity and core market solutions across sectors. A third of regulators worldwide have yet to

---

[28] WTO. Reference Paper on regulatory principles in telecommunications, Annex on basic telecommunications.

[29] Three countries in 2007 and 44 – in 2020, according to analysis based on the ICT Regulatory Tracker.

[30] Between 2007 and 2020, the number of regulators responsible for licensing grew from 115 to 148 and spectrum allocation and assignment – from 119 to 150, according to analysis based on the ICT Regulatory Tracker.

develop such institutional connection thereby failing to unlock synergies in the digital transformation.[31]

What's the outlook?

Next-generation digital regulators will be both community builders *and* facilitators of access to inclusive digital opportunities for businesses and users. They will need to rebalance their portfolios, fulfilling several roles at the same time. They will rely both on holistic and tiered strategies to support digital marketplaces, platform ecosystems as well as their various constituencies. The regulatory mandate increasingly requires approaching markets from an ecosystem perspective, building common ground across industry and consumers, government and citizens.

3.4   Tension 4: Sustainability vs economic growth

Twentieth century economists have often modelled economic growth as a function of capital, labour and technology.[32] While GDP has become established as the supreme measure of national economic performance, it is increasingly challenged. It fails to capture fundamental aspects of non-economic, human and social development. Importantly it caters neither for how wealth is distributed nor how growth is impacting our environment.[33] GDP-centric economic policies targeting growth have led to historically high levels of social inequality. The limits of this approach are now becoming clearer, especially when we measure the impact of digital technologies.[34] Economic studies have shown that digital technology generated growth mainly benefits the best-qualified segments of the population[35] – meaning the GDP growth generated by them is unequally distributed.

In light of recent international processes such as the UN SDG process, the Decade of Action and COPx, recognition has grown that we need "to reach a more 'wholesome' development tracker".[36] The *GDP+* vision captures green policies, perspectives that include human rights, inter-generational justice and general well-being, as well as broad social development indicators – all of these in addition to capital and monetary output. Though still a fundamental premise of most economies, the GDP approach is increasingly seen as insufficient, unsustainable in the mid- to long-term, and inadequate in the digital transformation context. This has led to the definition of alternative measurements, such as the Green Gross Domestic Product (GGDP) approach which essentially penalizes a country for employing manufacturing practices that harm the environment.[37]

Holistic international benchmarks accounting for aspects beyond GDP have multiplied over the past two decades. From the UN Human Development Index (HDI) to the Organisation for

[31] 60 countries practice formal collaboration between the telecom/ICT regulator or the ICT Ministry and a dedicated national digital agency while 74 engage in informal collaboration, according to analysis based on the G5 Benchmark 2021.

[32] Barro, R.J. and Sala-i-Martin, X. 2003. Economic Growth, MIT Press.

[33] Corporate Finance Institute. Shortcomings of GDP: Understanding the shortfalls of GDP and exploring alternative metrics.

[34] Eric Hazen. 2019. Technology and the common good: for a GDP that makes sense, 28 December.

[35] See for example Kharlamova, G., Stavytskyy, A., & Zarotiadis, G. 2018. The impact of technological changes on income inequality: the EU states case study. Journal of International Studies, 11(2), 76-94. Available at https://www.jois.eu/files/6_478_Kharlamova%20et%20al.pdf..

[36] The Economic Times.

[37] Corporate Finance Institute. Shortcomings of GDP. https://corporatefinanceinstitute.com/resources/economics/gross-domestic-product-limitations/, updated 11 December 2022.

Economic Co-operation and Development (OECD) Better Life Index to the Genuine Progress Indicator (GPI) and the Happy Planet Index (HPI), economists now take a broader view of development and sustainability, shifting focus away from economic issues – while economics remain part of the equation. In the technologies area, the McKinsey GDP+ Index was a first attempt to calculate the impact of technology adoption on welfare growth beyond GDP, focusing on innovation, skills and labour fluidity as a key to good social outcomes of technology adoption.[38] Increasingly, such elements will help guide regulators and policy-makers in the scoping and shaping of development and digital policy.

What's the trend?

Sustainability has been gradually integrated as a cross-cutting component of holistic and specialized digital development policy over past years, powered by the UN Framework Convention on Climate Change 'Conferences of Parties (COPs)'[39] and receiving increasing public attention and pressure from the Global Climate Strike movement.[40] Worldwide, 80 countries have adopted e-waste regulations or management standards[41] and 87 countries have policy instruments that coordinate and support the shift to sustainable consumption and production.[42] Sustainability as a supporting policy objective is also making its way into policy pieces in technical areas. The 2020 Internet of Things (IoT) Strategy of Bangladesh,[43] for example, is a tool that supports the implementation of national development policy goals with a focus on economic, societal, environmental and global needs.

The growing importance of ESG regulation

Climbing up the policy agenda, environmental, social and governance (ESG) regulation – focused on environmental, social and governance factors – is emerging to underpin existing sector regulations and is reframing the policy narrative around perspectives that address the whole of the ecosystem – perspectives that are long-term, human-centric and planet-centric. New governance patterns and regulatory collaboration on sustainability issues have become the norm. ICT regulators in close to two-thirds of countries are collaborating with the national environment agency or the ministry of environment.[44] Formal collaboration is twice more common than informal, and collaborative decision-making is looking at licensing of infrastructure operators to type approval for devices and equipment to e-waste. While such practices remain underdeveloped in many countries, hybrid governance models have also emerged. In the Netherlands, the Ministry of Economics and Climate has responsibility for both economic affairs and climate policy,[45] effectively bridging the GDP-led and the GDP+ approaches.

---

[38] McKinsey. 2019. 'Tech for Good': Using technology to smooth disruption and improve well-being, 15 May.

[39] UN Climate Change. https://unfccc.int/process/bodies/supreme-bodies/conference-of-the-parties-cop..

[40] Time. 2019. "This Is an Emergency. Our House Is on Fire". Greta Thunberg Addresses New York's Global Climate Strike. 20 September.

[41] According to analysis based on the G5 Benchmark 2021.

[42] UNSTAT. Ensure sustainable consumption and production patterns. https://unstats.un.org/sdgs/report/2021/goal-12/

[43] Government of the Republic of Bangladesh, Internet of Things Strategy, March 2020.

[44] 123 countries (89 practicing formal collaboration and 34 – informal), according to analysis based on the G5 Benchmark 2021.

[45] Ministry of Economics and Climate of the Netherlands.

The environment – now featuring in core regulatory frameworks

Environmental issues in the core telecom regulatory frameworks have gained momentum, too. In the GSR-20 Best Practice Guidelines 'The gold standard for digital regulation', the global community of regulators recognizes that policy must expand to cover the full cycle of digital technologies and services – from ideation to dissemination to recycling of digital products. Environmental factors must be taken into account at every stage of an integrated, consistent regulatory framework covering issues from the carbon footprint of cloud services to e-waste management to digitization of the economic sector's operations.[46] Regional regulatory associations have a role in advocating for better integration of sustainability in core regulations – for example in operators' licences and in the design of new incentives for market players to reduce costs of implementing sustainability measures. BEREC, the Body of European Regulators of Electronic Communications, evaluated the effect of electronic communications on the environment[47] to inform future practices of making telecom and digital regulation more environmentally-sound. It also hosts regional discussions on sustainability, advocating for better integration in EU and national regulatory frameworks.

Green investments are on the rise

Green investment is now helping accelerating progress on achieving the 2030 Agenda for Sustainable Development.[48] Traditional best practice regulatory instruments – such as passive infrastructure sharing – reduce the number of sites needed to meet demand, with better land use, decreased aesthetic impact and lower carbon footprint of mobile networks. This particularly applies in developing countries where towers are often powered by diesel generators. Tower companies are investing in green energy. By 2021, the American Tower Corporation (ATC) had invested more than USD 150 million in green energy solutions such as lithium-ion batteries and solar installations.[49]

French Government – breaking new ground

Integrating sustainability as a policy objective across sectors leveraging digital technologies also implies more collaboration with private players along with new frameworks for compliance. In 2021, the French Senate passed a law aiming to reduce the environmental footprint of digital technology. A study had found that the French digital sector accounted for 2 per cent of greenhouse gases in 2019 and that this figure could rise to 6.7 per cent by 2040.[50] The new law obliges French telecoms operators and Internet service providers (ISPs) to report on energy used and CO_2 output per GB of data transmitted on their networks – with consumers receiving calculations of their individual use too.[51] The goal is to make consumers aware that their use of the Internet has an environmental impact. The measure further suggests that if they reduce their

---

46 ITU. 2020. GSR-2020 Best Practice Guidelines, "The gold standard for digital regulation".
47 BEREC. 2021. Preliminary results on the effect of electronic communications on the environment. Actions and Impacts, 30 September.
48 ITU. 2021. GSR-2021 Best Practice Guidelines, "Regulatory uplift for financing digital infrastructure, access and use".
49 ATC International, contribution to the GSR-21 Consultation on "Regulatory Uplift for Financing Digital Infrastructure, Access and Use". https://www.itu.int/en/ITU-D/Conferences/GSR/2021/Documents/ Contributions%20BPG/GSR-21_Contribution_09_and_Letter_American-Tower-Corporation.pdf..
50 Sénat de France. 2020. Pour une transition numérique écologique, 24 June.
51 République Française.2021. Décret n° 2021-1732 du 21 décembre 2021 relatif aux modalités d'information sur la quantité de données consommées dans le cadre de la fourniture d'accès au réseau et son équivalent en émissions de gaz à effet de serre, 23 December. https://www.euractiv.com/section/digital/news/new-law-forces-french-operators-to-disclose-carbon -footprint-to-public/..

data use, they will also reduce their energy use. The approach has been criticized[52] as targeting users rather than operators – who after all, are responsible for technology choices and network efficiencies – and reflecting bias from external sources. The measures indirectly associate the video-streaming traffic generated over digital platforms with the carbon footprint of operators. These new French measures nevertheless break new ground by introducing environmental performance-based legal instruments for the telecom sector and involving ADEME, the national agency for ecological transition, in its enforcement rather than ARCEP, the ICT regulator.[53]

Self-regulation – an alternative path

Self-regulation can offer an alternative path to reducing carbon emissions of telecoms operators. T-Mobile Netherlands, for example, has a long-standing strategy for handling the growth of data traffic. As part of its CSR scheme, it gives its customers an allowance of 10 GB per day and in consequence has saved 5.3 per cent electricity.[54] Most operators worldwide however are behind the curve. In the Corporate Knights Global 100[55] of the world's most sustainable corporations, only five are telcos (BT, KPN, Cogeco, Telus and StarHub) and none of them is in the top 30.[56]

What's the outlook?

Digital development will drive new policy – holistic and human-centric – *and* will benefit from the shift to GDP+ approaches since digital is recognized as an equalizer of development across the board. But digital players will also be affected by global economic and geopolitical trends, and will need to adapt – as some have already. For example, the current energy shortage in Europe has prompted the EU to consider a crackdown on the crypto mining industry, known for its significant energy footprint, and spurred on by a major player in the field which moved their network from proof of work to proof of stake, slashing energy consumption by 99 per cent.[57] Other players such as data centres may be less prepared for the climate crisis and new sustainability requirements. As climate change increases the risks of floods, fires and droughts, data centres need to minimize their future vulnerability, ensuring business continuity for the users depending on their services.[58]

As the traditional GDP approach fades in relevance, sustainability and energy efficiency as a policy imperative will increase in importance in the coming years – a trend already underlined by the steep rise in adoption of ESG measures and in the number of matching private sector CSR initiatives coming on-stream. Nevertheless, GDP has underpinned the economic systems of some 200 countries worldwide for almost two centuries – and shifting to the broader focus is likely to be slow, further exacerbating existing divides and failing to reshape policy goals towards sustainability and equality in the short term in developing and least developed countries.

---

[52]   Numérama. 2021. Mesurer le CO2 selon les gigaoctets consommés : l'idée qui consterne le secteur du numérique Une méthode de calcul discutable, 24 December.
[53]   Agence de la transition écologique (ADEME).
[54]   T-Mobile Netherlands. CSR REPORT T-Mobile Netherlands 2021.
[55]   Corporate Knights. 2021. Global 100.
[56]   STL Partners. 2021. Telcos' role in reducing carbon emissions, September.
[57]   Protocol Climate Newsletter, 10 October 2022.
[58]   Protocol Climate. Data centres aren't prepared for the climate crisis, 1 November 2022.

3.5   Tension 5: National vs global regulation

Nation states remain the backbone of today's globalized world – and national legal systems are stronger and in many ways more determinant than international treaties. Since the birth of the Internet and now with the looked-to rise of Web3,[59] national regulatory frameworks have been constantly challenged by new, trans-border issues. While regional and international treaties have been negotiated in areas such as cybersecurity, data governance and trade, such instruments often do not resolve important, contentious issues – and are not consistently applied in all regions. Since adherence is often voluntary and enforcement impractical, commercial interests and the need for operational compliance and interoperability have been the real drivers in honouring treaty commitments, and with varying degrees of success. What's more, regulatory arbitrage may upset the nation's level playing field – where this exists –therefore making it difficult to build across borders, with a direct impact on consumers and services.

With digital becoming more prevalent across government and economies, one important objective at the international and regional level has arisen – the harmonization of legal frameworks in areas such as competition policy, data privacy and cross-border data flows, and with calls on government to[60]:

- Cooperate and build a common understanding at the international level on **anti-competitive behaviours** in the digital economy and on convergence towards regional harmonization to spearhead innovation and investment in digital infrastructure and services.
- Encourage regional and international cooperation on **data privacy and cybersecurity** to streamline the patchwork of data privacy and cybersecurity rules through a common regional approach that allows free flow of data and digital trade.
- Intensify international cooperation on **cross-border data flows** to ensure that data localization requirements are minimally trade-restrictive, promote trust and to ensure restrictions do not interfere with cross-border communications – so that the economic and societal benefits that global data networks make possible are maximized.

What's the trend?

Negotiations have brought governments together to solve issues with digital markets and services in trade, data privacy, data governance, cybersecurity and taxation. Such agreements can provide the backbone for handling cross-border issues but often stumble on enforcement. The EU's 2018 General Data Protection Regulation (GDPR)[61] is touted as 'the toughest privacy and security law in the world'[62] coding fundamental digital rights such as user consent for the use of personal data and the right to be forgotten, along with strong sanctions on market players not following the rules. The OECD/G20 Inclusive Framework on Base Erosion and Profit Shifting (IF), agreed in 2021, addresses tax challenges arising from the digitalization of the economy[63] – introducing a new tax collection mechanism for global digital platforms in countries where their

---

[59]   Arguably, a better, more decentralized version of the Internet, built atop distributed ledgers known as blockchains, see for example The Economist, Will web3 reinvent the internet business?, 29 January 2022.
[60]   See also ITU. 2021. GSR Best Practice Guidelines 2021, "Regulatory uplift for financing digital infrastructure, access and use".
[61]   EC. General Data Protection Regulation (GDPR).
[62]   EC. What is GDPR?
[63]   OECD. 2021. Statement on a Two-Pillar Solution to Address the Tax Challenges Arising from the Digitalisation of the Economy.

services are used, and profits generated.[64] It remains unclear if this is enforceable and whether users or platforms will pay the extra tax – nevertheless, the new framework is significant as for the first time, it attempts to address challenges of the digital space spreading across borders.

Bilateral and multilateral agreements – some pros and cons

Bilateral and multilateral agreements show promise in removing barriers to the free flow of telecom and digital goods and services across borders. Economic multilateralism can help ensure the provision of global public goods[65] – including telecom and digital goods and services. WTO-led initiatives are currently working on new multilateral frameworks for trade in services and e-commerce (see Box 3). What's more, international data agreements such as the EU-US and Switzerland-US Safe Harbor agreements and the Council of Europe Convention 108 or GDPR, for example, foster cross-border transactions by enhancing consumer trust and the interoperability of national regulatory frameworks. This provides legal clarity for firms operating in distinct jurisdictions. However, such agreements can also involve compliance costs and restrictions on the free flow of data, potentially creating trade barriers. More recently, Digital Economy Agreements (DEA) provide an alternative way of powering bilateral trade in the digital space. The United Kingdom and Singapore, for example, have reached an agreement in principle on a DEA for mutual open access to the digital economy, enabling countries to invest and operate freely and in fair competition in their partner economy.[66] The agreement covers digital trading systems, data, financial services, digital identity, consumer protection and cybersecurity.

---

[64] The full definition is "In-scope companies are the multinational enterprises (MNEs) with global turnover above 20 billion euros and profitability above 10% (i.e. profit before tax/revenue) calculated using an averaging mechanism with the turnover threshold to be reduced to 10 billion euros, contingent on successful implementation including of tax certainty on Amount A, with the relevant review beginning 7 years after the agreement comes into force, and the review being completed in no more than one year. Extractives and Regulated Financial Services are excluded." See OECD. 2021. Statement on a Two-Pillar Solution to Address the Tax Challenges Arising from the Digitalisation of the Economy.

[65] WTO. 2022. DDG Ellard: Multilateralism is the solution to challenges of global commons, unilateralism.

[66] UK Government. 2021. UK-Singapore Digital Economy Agreement: agreement in principle explainer.

Box 3: A domestic regulatory framework that boosts trade in services and e-commerce

Currently two major World Trade Organization (WTO) initiatives under negotiation have direct relevance to the telecom sector while impacting the digital transformation across economic sectors.

- **Joint Initiative on E-commerce (JSI)**: the JSI was initiated in January 2019 by 76 WTO Members, seeking "to achieve a high standard outcome that builds on existing WTO agreements and frameworks with the participation of as many WTO members as possible" – the goal was to remedy inequalities in e-commerce. Two years later, 86 countries participated in these discussions, representing over 90 per cent of global trade.[1] Low-income developing countries have expressed concerns that the plurilateral approach – as opposed to a more inclusive, global approach – 'weakens multilateralism'.[2] The pillars of JSI aim to codify international rules for the free flow of data, data localization, and the protection against access to or transfer of the source code for computer programs or algorithms. The negotiated text links to global instruments such as the Agreement on Trade-Related Aspects of Intellectual Property Rights (TRIPS) and GDPR, and has far-reaching consequences for trade and development in less developed countries.[3] The JSI has the potential to facilitate cross-border data, goods and services flow – but only if the rules allow countries to address their public policy objectives and development needs, and if they help level the playing field for less technologically advanced countries. This would include helping them create and capture value from digital data.[4]

- **Revision of 1997 WTO Reference Paper.** Negotiations are under way on the revision of this paper to ensure domestic measures 'do not unnecessarily restrain trade' in the digital transformation. The text currently negotiated[5] covers 'licensing requirements and procedures, qualification requirements and procedures, and technical standards affecting trade in services'. While significant, this initiative does not include a majority of 164 WTO members (some 65 participants including all EU countries). Reasons for not joining include long-standing tensions from larger talks that date back to the early days of the WTO. At play too are concerns that new WTO disciplines on domestic regulation in services could interact with members' existing commitments as well as concerns that new disciplines might constrain countries' policy space at the domestic level[6] – for example the granting of Most-Favoured-Nation status.

These two WTO negotiations could improve trade-related issues in telecom and digital markets, aligning them with global development goals and national policy priorities. Regional approaches could build towards a much-needed global framework that underpins interoperability, enforcement and dispute resolution across jurisdictions. JSIs can help redefine multilateralism if more developing and least developed countries join the discussions and the new agreements better address their needs. What's more, new regional and international fora might help build international policy coherence[7] and widen the digital trade debate to issues such as data governance and digital technologies, which do not all fall in the mandates of a single existing intergovernmental agency.

Source: ITU, based on WTO public information.

---

1. WTO. Joint Initiative on e-Commerce.
2. WTO. Joint Initiative on e-Commerce. Submission of Côte d'Ivoire (restricted access).
3. IISD, Leonila Guglya and Marilia Maciel. 2020. Addressing the Digital Divide in the Joint Statement Initiative on E-Commerce: From enabling issues to data and source code provisions.
4. UNCTAD. 2021. What is at stake for developing countries in trade negotiations on e-commerce? The case of the joint statement initiative .
5. Joint Initiative on Services Domestic Regulation. Reference Paper on Services Domestic Regulation.
6. IISD, SDG Knowledge Hub. Participants in Services Domestic Regulation Talks Agree Text Ahead of MC12, 5 October 2021.
7. See: WTO Public Forum 2021, Centre for International Governance Innovation (CIGI). How to construct a global governance architecture for digital trade, 28 September 2021.

Regional efforts in Europe and Africa

Further regional efforts are controversial for some. The newly adopted EU Digital Services Act and Digital Markets Act tackle core concerns in the trade and exchange of illegal goods, services and content online and disinformation – as well as the dominant market position of global digital platforms.[67] The African Union (AU) is consulting on a 'Data Policy and Governance Framework' to unlock the transformative potential of data to empower African citizens, safeguarding digital rights and driving forward an inclusive, sustainable digital economy and society.[68] The framework will lay the foundation of the digital economy across Africa, deriving synergy from the economic integration initiatives under the African Continental Free Trade Area (AfCFTA),[69] and will drive cooperation on core digital issues such as data protection.

Data localization policies have proliferated

In contrast, some countries have favoured national, often protectionist measures on issues like data governance or competition to keep tighter control over markets and market players, in particular global digital platforms. Data localization policies undermine the impact of data-intensive services on economic productivity and innovation. According to a 2018 OECD analysis, digitalization is linked with greater trade openness, selling more products to more markets – and that a 10 per cent increase in bilateral digital connectivity increased trade in services by over 3 per cent.[70] Nevertheless, data-localization measures have more than doubled in four years, arguably to prevent massive job losses and protect sensitive data (personal, health) or national security interest. Countries may also be concerned about the vast monetization potential of consumer data by foreign digital platforms, which remain out of bounds for national tax and law enforcement authorities. In 2021, 62 countries imposed 144 restrictions with dozens more under consideration.[71] Restricting data flows has a statistically significant impact on a nation's economy – sharply reducing its trade volumes and productivity, and increasing prices for downstream industries that increasingly rely on data.[72]

What's the outlook?

Governments need unassailable and practical legal instruments – both national and international – to navigate the digital transformation. Regional approaches provide viable models of cross-border collaboration on data-related issues, but will fail in enabling universal, seamless cross-border data flows. A global compact and framework may be the only way to address thorny issues such as two-sided markets, global digital platforms, digital currencies and privacy, among others – from ethics to transparency and reliability to taxation. While national sovereignty and law will remain dominant in dealing with these issues, new international and regional treaties will be needed to set boundaries, reframe rules and adapt them to digital markets if we are to ensure better protection of users and equal opportunity for all digital market players regardless of size, scope or nature. The current international debate is fragmented and makes it challenging

---

[67]   EC. The Digital Services Act package.

[68]   Centre for the Study of the Economies of Africa (CSEA). 2021. Strengthening data governance in Africa, Project Inception Report, July 2021.

[69]   African Union. https://au.int/en/cfta..

[70]   OECD. 2018. Digital Trade and Market Openness (OECD Trade Policy Papers, No. 217).

[71]   Information Technology & Innovation Foundation (ITIF), Nigel Cory and Luke Dascoli, How Barriers to Cross-Border Data Flows Are Spreading Globally, What They Cost, and How to Address Them, July 2021.

[72]   Using a scale based on OECD market-regulation data, ITIF finds that a 1-point increase in a nation's data restrictiveness cuts its gross trade output 7%, slows its productivity 2.9%, and hikes downstream prices 1.5% over five years. See OECD. 2018. Digital Trade and Market Openness (OECD Trade Policy Papers, No. 217).

for less developed countries to actively participate in negotiations. In data governance alone, more than 250 international and regional fora are currently active.[73] Fewer channels will enhance international policy coherence and simplify the involvement of national agencies. Moreover, we need multiple channels for collaboration across agencies at national and international levels to both zoom in and zoom out on regulatory and enforcement issues with telecom and digital markets.

3.6 Through tensions to a blend of solutions

The five tensions set out above will persist through the Decade of Action.[74] They frame the evolution of policy and regulatory models into the future – through economic turmoil, recovery from the pandemic and other challenges in the year ahead.

Such tensions are inevitable but can be overcome. The new equilibrium will require that we elevate today's holistic policy approach to a systems thinking approach if we are to leverage the profound connection between digital technologies and public goods and economic activities across the board – from health and trade to education and entrepreneurship, and charting the way through another transition, towards lean governance models. The breadth and the depth of such models will provide for policy coherence and development impact.

---

[73] Internet and Jurisdiction Policy Network. 2021. We Need to Talk About Data: Framing the Debate Around Free Flow of Data and Data Sovereignty. https://www.internetjurisdiction.net/uploads/pdfs/We-Need-to-Talk-About-Data-Framing-the-Debate-Around-the-Free-Flow-of-Data-and-Data-Sovereignty-Report-2021.pdf..

[74] UN Decade of Action.

4 Policy and regulatory strategies that drive digital transformation[75]

4.1 The next frontier for digital policy and regulation

In a world in flux, policy- and decision-makers have the greatest of responsibilities in ensuring universal and meaningful connectivity, sustainable finance for digital development projects, and in supporting the digital transformation of economies, thereby meeting the goals of national digital agendas and ultimately, the Sustainable Development Goals at the heart of the United Nations 2030 Agenda for Sustainable Development.[76] This undertaking involves a transformation of policy-making processes, governance models and new channels for policy implementation.

As digital technologies have become more widespread, affordable and powerful, policy and regulation have shifted focus from the narrow telecommunication sector to powering the digital transformation across the economy. The baseline for effective regulation has changed. Furthermore, new approaches offer multiple paths through the digital transformation. Such approaches rely on shorter and more inclusive policy cycles, agile regulatory responses and continuous experimentation, to match the pace of innovation and the ambition of the global development agenda. Unlike traditional telecommunication regulation, there is no single blueprint for best practice, but an array of tools that converge towards common goals that match the specificities of national contexts, political and legal systems, cultural backgrounds and economic priorities.

In the vortex of widespread change in the aftermath of COVID-19, the need to redefine policy priorities and the roles of stakeholders, and to identify new tools, has become more pressing. Tensions nevertheless persist between established and emerging approaches (see Chapter 3), so new strategies will need to prove themselves as old certainties may not hold true – and new norms are yet to form.

This chapter will go on to explore five strategies that policy-makers and regulators can adopt to navigate the digital transformation, and deliver on the ambitions and needs of both the connected and the unconnected. Each of these strategies broadens the policy options at hand, and avoids anchoring decisions in the past or using a silo perspective. They put decision-makers in the driver's seat throughout the digital transformation journey, and offer the keys to unlocking digital dividends for all. These strategies are grounded in the findings of the G5 Benchmark,[77] a reference framework of good practices for digital policy and regulation (see Box 9).

---

[75] An advance version of this chapter appeared in the ITU Global Connectivity Report 2022.
[76] United Nations, "Transforming our world: the 2030 Agenda for Sustainable Development". https://sdgs.un.org/2030agenda..
[77] Available at https://app.gen5.digital/benchmark/metrics..

4.2   Strategy 1: Build ambidextrous leadership

When the only constant is change, sound policy leadership is imperative.

Through a natural process of tension and disruption, the mainstream policy perspective has shifted towards more inclusive multistakeholder processes. These seek to meet both complementary and competing objectives of governments, businesses and citizens – from affordability and inclusion to sustainability and economic growth, to innovation and investment. National decision-makers need to pursue long-term market development, while remaining agile and retaining short-term flexibility and a 360-degree perspective. New leaders in policy and regulation need to master the blending of traditional and experimental approaches, combining styles of rule-making and enforcement – and adapting their implementation to local context and circumstance. Signature policy leadership through the digital transformation is built squarely around embracing ambiguity and uncertainty, with a growth mindset and out-of-the-box thinking – and when new challenges emerge, policy-makers and regulators can combine the tried-and-tested with a new approach, and with equal ease. Building leadership capacity across all levels of government will equip decision-makers to lead markets in the right direction, to the benefit of digital economies and societies.

Moving the needle

While traditional policy and regulatory approaches remain prevalent, experimental techniques are emerging and are increasingly adopted. In the experimental space, several models have been gaining momentum:

- **Sandboxing:** Regulatory sandboxing promotes innovation and allows open, dynamic participation of stakeholders, while encouraging the adoption of new technologies and business models by industry and society[78]. Today, nearly a quarter of countries worldwide have created safe spaces for regulatory experimentation – regulatory sandboxes.[79] Rwanda stands out with its 'test and learn' environment: companies can obtain a one-year permit allowing them to try new ideas, concepts and services within a light-touch regulatory framework. Rwanda's proof-of-concept hubs have enabled the development of transformative services and applications including drone-based and AI-driven health services, such as Zipline. The performance-based approach allows both regulators and operators to respond dynamically to technical challenges, including ensuring public safety[80]. In Colombia, a regulatory sandbox designed by CRC, the communications regulator, has provided an alternative regulatory mechanism to test communication products and services for a limited period under flexible or no regulation. The first regulatory sandbox in 2020 piloted 23 different proposals, ranging from bringing 4G coverage in rural areas with new technologies to a platform for real-time measurement of the mobile Internet user experience, and a simplified contracting process for fixed and mobile services through a unified service agreement.[81]

- **Policy labs:** In the United States, some state and local governments have established policy labs to partner with academia, using administrative data to evaluate and improve programmes and policies, while safeguarding personal privacy. The labs provide the technical infrastructure and governance mechanisms to help governments gain access to

78   ITU, Colombia country review: Regulation at the forefront of digital transformation, 2023 (forthcoming)
79   A total of 47, according to analysis based on the G5 Benchmark 2021.
80   ITU, Switching on Smart Rwanda: Digital inclusion, collaboration and a G5 mindset.
81   Available at www.crcom.gov.co/es/noticias/comunicado-prensa/conozca-proyectos-admitidos-para-experimentacion-en-sandbox-regulatorio.

analytical talent, while the data labs are helping to convert data into insights, and driving more evidence-based policy-making and service delivery (ITU, 2021b; Governing, 2017).[82]

- **High-level framework for experimentation:** Almost a third of countries have identified emerging technologies as a policy priority adopting a forward-looking spectrum strategy[83] or regulations and plans with regard to IoT.[84] Far fewer have specifically tackled key new areas such as cloud computing or AI – respectively one-fifth[85] and one-sixth[86] of countries – with only 16 countries having integrated all of those complementary areas.[87] In effect, the vast majority of governments have yet to canvas emerging technology issues in their policy and regulatory frameworks.

4.3   Strategy 2: Bridge silos and break through insularity

There is universal agreement that demolishing silos is the way forward in modern governance – and yet, silos are still common in national institutions and policy implementation. Adopting a whole-of-ecosystem approach to policy inception, design, prototyping and implementation is an issue in many countries. Where these issues persist, they hinder digital market development, innovation and value creation. The gold standard for digital policy and regulation[88] has been established as genuine, outcome-based collaboration and coordination across government. Such collaboration builds bridges over decision-making silos, creates efficiencies, builds a common language between institutions and stakeholders, and provides for learning – and yet, the interface between institutions, stakeholder groups and consumers needs fixing in many places.

In the context of digital transformation, a single-sector perspective can no longer be the mainstay of a policy. Many of the cross-cutting topics increasingly mainstreamed in digital policies are rooted in broader development issues and should be addressed through policy coherence across sectoral silos. The design of governance frameworks – or rather, of governance networks for digital – will be different from the previous generations of institutions, moving away from silo thinking and insular decision-making. New models of stakeholder collaboration and coordination will emerge from those that are more prevalent today, taking the breadth and depth of interaction to the next level. Collaboration will likely evolve towards patterns that are functional, blended into governance processes, and multi-modal. Outcome-based approaches will leverage fluid, needs-based collaboration, both formal and informal, as an essential feature of governance networks.

---

[82]   ITU, Emerging technology trends: Artificial intelligence and big data for development 4.0. See also: http://www.governing.com/commentary/col-why-every-mayor-should-consider-launching-policy-lab.html.

[83]   A total of 62, according to analysis based on the G5 Benchmark 2021.

[84]   A total of 57, according to analysis based on the G5 Benchmark 2021.

[85]   A total of 40, according to analysis based on the G5 Benchmark 2021.

[86]   A total of 30, according to analysis based on the G5 Benchmark 2021.

[87]   According to analysis based on the G5 Benchmark 2021.

[88]   ITU, Global Symposium for Regulators (GSR) 2020 Best Practice Guidelines "The gold standard for digital regulation"

Moving the needle

Traditional models of formal and informal collaboration at the national level have become mainstream across regions, and across different political and legal systems. In traditional areas such as competition and spectrum management, four in five ICT regulators engage with their counterparts, mainly through formal channels.[89] Collaboration is vital, but remains less established with data protection and financial regulators. The collaborative approach in these areas today reaches around half of countries worldwide – effectively doubling in only three years.[90] Anecdotally, data protection agencies appear to collaborate more among themselves through the global network of national data protection agencies than with stakeholders at the national level.[91] The areas with the *least* collaboration are transport and energy,[92] reflecting the disconnect that persists between digital infrastructure deployment and other civil engineering works in the other half of countries. While coherence in policy implementation has taken off, harmonization across important areas needs to be taken further.

As the ICT regulator mandate has expanded into new areas, 60 per cent of them collaborate beyond their traditional sector with ministries of education, health and government services.[93] In this context, informal channels are used more often than among independent regulatory authorities, accounting for a quarter to a third of interactions between the ICT regulator and ministries. After two years of the global pandemic, the case for a whole-of-government approach is clear. In 70 per cent of countries,[94] coordination and collaboration have increased between the ICT regulator and the national agency in charge of the digital transformation.

Strengthening the focus of existing formal and informal collaboration channels, and moving towards outcome-based approaches, will fast-track policy implementation in the digital transformation (see Box 4). Moreover, stronger coordination mechanisms at the national and international levels can go a long way towards coherent implementation and attaining policy goals.

---

[89]   A total of 85% of ICT regulators collaborate with the national spectrum agency and 83% with the competition authority, according to analysis based on the G5 Benchmark 2021.
[90]   Between 2018 and 2021, analysis based on ITU (2018) and the G5 Benchmark 2021.
[91]   A total of 134 national and subnational data protection agencies from 87 countries and economies (virtually all existing) are part of the Global Privacy Assembly (https://globalprivacyassembly.org/participation-in-the -assembly/list-of-accredited-members)) vs 49% of agencies engaging in cross-sectoral collaboration at the national level.
[92]   A total of 35% of ICT regulators collaborate with the transport regulator/ministry, and 44% with the energy authority, according to analysis based on the G5 Benchmark 2021.
[93]   Analysis based on the G5 Benchmark 2021.
[94]   Analysis based on the G5 Benchmark 2021.

> ## Box 4: Collaboration frameworks and outcomes: insights from Mexico and Tanzania
>
> In **Mexico**, inter-agency collaboration is an important part of the Federal Telecommunications and Broadcasting Law. Since 2013, Instituto Federal de Telecomunicaciones (IFT) – the ICT regulator – has implemented 34 collaboration agreements with universities, civil associations, other government entities and other sector regulators. Thus, IFT and the National Commission for the Protection and Defence of Financial Services Users collaborate in the area of cybersecurity and in ensuring the reliability of digital financial services. IFT and Procuraduría Federal del Consumidor (PROFECO), the consumer protection agency, collaborated on the creation of the *Soy Usuario* platform, which enables consumers to file complaints against telecommunication service providers and receive a rapid response to their problems.
>
> IFT has further strengthened the framework for institutional collaboration in its 2021–2025 roadmap, a strategic framework focused on the development of a digital ecosystem from a holistic and collaborative perspective. The roadmap has a strong focus on collaboration: each of the 54 regulatory action lines specifies the entities with which IFT has to collaborate.
>
> In **Tanzania**, inter-agency collaboration has enabled the development of the local financial technology (fintech) sector. The National Financial Framework (2018–2022) sets the basis for collaboration under the National Council for Financial Inclusion. The Council includes the Central Bank Governor (Chairperson), supported among others by the Tanzania Communications Regulatory Authority (TCRA), the ICT regulator, which is a member of the Council Steering Committee Technical Team, and participates both at the executive and expert level through the TCRA Director General, the Director of Industrial Affairs and a principal financial analyst. TCRA plays different roles in the implementation of the fintech strategy – from ensuring that technology and infrastructure are in place, to ensuring that subscribers are registered and supporting cybersecurity implementation.
>
> The Council applied a test-and-learn approach to the then-new mobile money concept in 2008, when the Central Bank granted 'non-objection letters' to the TCRA regulated mobile operators and their banking partners. To implement this approach, the Bank of Tanzania put regulations in place that ensured that non-banks (such as Mobile Network Operators) could continue to receive non-objection letters to act as mobile payment service providers. Slightly over a decade later, Tanzania's mobile money penetration reached 53 per cent, with 29.7 million mobile money subscriptions in 2020, for a transaction value of USD 81 billion.[1]
>
> Source: ITU, [Collaborative regulation for digital transformation in Mexico](). Collaborative Regulation Country Case Studies series.
>
> ————————
>
> [1] TanzaniaInvest, "TanzaniaInvest Reaches 10,000 Registered Newsletter Users". 23 September 2014. www.tanzaniainvest.com/economy/tanzaniainvest-10000-registered-newsletter-users.

4.4   Strategy 3: Develop a common language

Building a common language across stakeholder groups is essential – this avoids policy implementation getting lost in translation in the context of digital transformation. Leveraging stakeholder dialogue and data to guide decisions will allow co-creating more diverse and resilient regulatory solutions.

Effective stakeholder dialogue is one of the main enablers of regulatory compliance and policy implementation in the digital transformation. It is still not very common to integrate the private sector or other economic sectors' perspectives across the policy and regulation processes – from design to prototyping to implementation – although digital policies have an impact on all stakeholders. Regulatory tools and processes are at hand to remedy the perspective gap:

- **Data and analytical evidence** can serve as a common language to weigh the challenges and opportunities of reforms and power balanced decision-making, maximizing positive outcomes while minimizing risks. Both national metrics and global benchmarks can bring valuable insights to support regulatory thinking and decision-making.

- **Regulatory taxonomies** and defining key terms build the basis for constructive debate and clear expectations. What can be obvious for some may mean something different to others. Is 'Internet' the fibre infrastructure layer of the World Wide Web or online services or content? What do we mean by 'data' in trade discussions or data localization policies? Beyond the national level, international discussions also benefit from agreeing on common terms to build clear, consistent and enforceable rules.

- **Building an environment and a culture of consultation**, and convening a platform – a network, committee or agency – all play roles in the blending of perspectives and genuine partnerships on policy or regulatory 'projects'. Active and continuous stakeholder dialogue enhances the quality and relevance of legal frameworks, while accelerating the pace of innovation and entrepreneurship in digital markets.

Moving the needle

Dialogue and consultation are part of the DNA of effective, pro-market regulation. Public consultation on regulatory decisions is today commonplace in 80 per cent of countries.[95] Taking the process to the next level, however, is much less common. Only a fifth of countries commit to designing public consultations as a tool to guide regulatory decision-making by introducing longer timelines for comments, responses to stakeholder views and public hearings.[96] Further along the path towards evidence-based regulatory approaches, half of agencies in charge of regulation apply a formal requirement for conducting Regulatory Impact Assessments before major regulatory decisions are made.[97] The majority of regulators still need to adopt a fully-fledged evidence-based approach to new and emerging issues, and to far-reaching regulatory decisions.

4.5   Strategy 4: Reframe and operationalize policy agendas

While a recipe for perfect policy does not exist, the expectation is that a policy piece will be 'living' for five to seven years after its adoption, serving as a launch pad for solving the greatest and newest problems governments and markets face.

How to plan ahead when we are blindfolded by uncertainty and ambiguity? Setting a vision for the future is like walking on a tightrope – balancing needs and wants, and translating them into goals while weighing the required resources.

Reframing policy narratives from single-sector to whole-of-society

Fundamental principles of the modern State – such as equality (based on gender, origin or income), good governance or participation – have become defining elements of policies, and critical vectors of development. They are geared towards directly addressing barriers and challenges in achieving impact and addressing systemic issues, while reinforcing social and economic progress.

Digital policies now span multiple horizontal and vertical areas. Financial inclusion policies focus on digital tools and currencies, along with a focus on the unbanked, the illiterate and those with no official identification. Education policies build in gender and fundamental rights perspectives along with technology. Digital policies are increasingly underpinned by sustainability and innovation, targeting those at the bottom of the pyramid, women and youth. The 2030 Agenda for Sustainable Development is an example of streamlined development imperatives and the

---

[95]   A total of 154 countries use public consultations for some or all regulatory decisions, according to analysis based on the ICT Regulatory Tracker.

[96]   A total of 41 countries gather feedback from national stakeholders in a structured and interactive way, according to analysis based on the G5 Benchmark 2021.

[97]   A total of 95 countries, according to analysis based on the G5 Benchmark 2021.

policy goals cutting across the board. The almost overwhelming number of issues identified in targets and goals makes it challenging, though, to coordinate and implement a comprehensive, coherent set of policies. Mainstreaming core themes across digital and sectoral policies can make coordination on the ground smoother and allow faster progress towards higher-level development goals.

In the wake of recovery from COVID-19, governments have an opportunity to reframe their policy agendas and mainstream new priorities along with a broad development perspective. The circular economy, digital innovation and gender empowerment have moved to the forefront of a new systemic approach to addressing policy implementation challenges – an approach where new legal instruments will redefine the focus for global action in the face of economic, technological and climate disruption.

Craft roadmaps

When the final destination is clearly defined in policies, regulators need to chart the fastest, safest road to it, breaking it down into milestones and crafting a timeframe. A sound regulatory roadmap will accompany national stakeholders in unfolding implementation and keeping on track. By providing clarity and predictability, a roadmap provides a single reference frame for implementation mirroring a high-level policy vision and operationalizing its objectives. A regulatory roadmap is a useful instrument for keeping everyone aligned to common objectives and in sync with other stakeholders. From stakeholder coordination to planning investment and deployment decisions to making sure efforts deliver desired outcomes, regulatory roadmaps provide a framework for ecosystem orchestration of policy implementation across the economy and society.

Two years of COVID-19 taught us that iteration, trouble-shooting and incremental improvement are decisive in policy implementation. Without such an agile, 'work-in-progress' approach, progress can be jeopardized, and national digital ambition can be left behind.

Moving the needle

Slightly more than half of countries[98] have digital strategies covering multiple economic sectors,[99] leading the way to economic recovery. Examples of native digital agendas are the EU 2030 Policy Programme 'Path to the Digital Decade', the Kenya Digital Economy Blueprint (see Box 5) and the Malaysia Digital Economy Blueprint.[100] More than a third of countries also have defined mechanisms for implementation and operational objectives in their strategies.[101] While these figures spell good news for millions of digital users in these markets, the majority of countries still need to define digital policy priorities and commit to sound implementation frameworks.

---

[98] A total of 103 countries have overarching, cross-sectoral digital policies or strategies, according to analysis based on the G5 Benchmark 2021. (Broadband plans and universal policies are not counted here.)

[99] Digital agendas as defined here typically include holistic social and economic goals in multiple economic sectors, and contain operational mechanisms for implementation and a structured monitoring and evaluation framework.

[100] See European Commission (2021); Government of Kenya (2019); and Economic Planning Unit, Prime Minister's Department, Malaysia (2021). Broadband plans and telecommunication sector-specific connectivity strategies do not qualify as native digital strategies.

[101] A total of 69 countries, according to analysis based on the G5 Benchmark 2021.

Box 5: The Kenya Digital Economy Blueprint

The Ministry of ICT Innovation and Youth Affairs of Kenya (MICT) published the Digital Economy Blueprint in 2019 after collaboration with the Communications Authority, the National Communication Secretariat and the Konza Technopolis Development Authority (all housed within MICT), along with the Central Bank, Ministry of Trade, Ministry of Education, National Treasury, Kenya Revenue Authority and Postal Corporation of Kenya. Private sector stakeholders were also consulted, including the industry group Technology Service Providers of Kenya. The Blueprint defines the digital economy as "the entirety of sectors that operate using digitally-enabled communications and networks leveraging Internet, mobile and other technologies, irrespective of industry".[1]

Beyond Kenya, the Blueprint contributes to the Smart Africa Alliance initiative, which is working to digitize the economies and trade of 30 countries across the continent to create a single digital market.[2] The 30 member States are expected to adopt the Blueprint and develop their respective country strategies. The figure below highlights the wide range of national public bodies, as well as international players, responsible for developing and implementing the Blueprint.

National and international bodies involved in the Digital Economy Blueprint
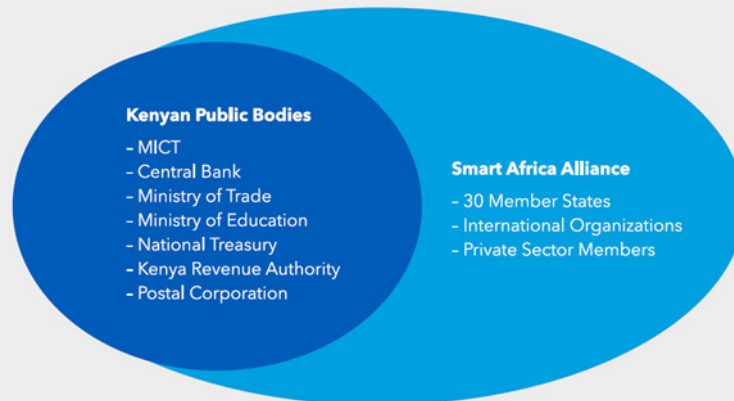
The Blueprint establishes a five-pillar framework to realize a successful and sustainable digital economy in Kenya, recognizing that all sectors and industries fall within the definition of the digital economy. The five pillars and underlying objectives include:

- **Digital government:** Improve government services to citizens and increase government revenue, productivity and cost reduction through digitized and streamlined processes.
- **Digital business:** Adopt secure, affordable, open and efficient digital payment systems and financial services that protect consumers and encourage cross-border trade.
- **Infrastructure:** Connect every Kenyan, business and government or public facility with broadband, as well as improve critical broadband infrastructure, such as the national fibre-optic backbone, undersea fibre cables and data centres.
- **Innovation-driven entrepreneurship:** Increase the contribution of digital products and services to the Kenyan economy, and develop a sustainable support system for innovation through industry/academia research collaboration and access to funding.
- **Digital skills and values:** Increase the number of graduates trained in advanced digital skills.

Sources: Government of Kenya (2019)[3] and ITU (2022).[4]

---

[1] Government of Kenya. Ministry of ICT Innovation and Youth Affairs of Kenya (MICT). 2019. "Digital Economy Blueprint, Powering Kenya's Transformation". Executive Summary.

[2] Communications Authority. "Kenya Launches Digital Economy Blueprint". 19 May 2019. www.ca.go.ke/kenya-launches-digital-economy-blueprint/.

[3] Government of Kenya. Ministry of ICT Innovation and Youth Affairs of Kenya (MICT). 2019. "Digital Economy Blueprint, Powering Kenya's Transformation". Executive Summary.

[4] ITU. Collaborative regulation for digital transformation in Kenya: A country review. 2023 (forthcoming)

Regional digital agendas provide a much-needed framework for policy and regulatory harmonization – and help in putting digital transformation at the top of national policy agendas. The Digital Agenda for Europe[102] and the Digital Transformation Strategy for Africa (2020– 2030)[103] are aligned with the Sustainable Development Goals of the 2030 Agenda 2030 goals and elevate national aspirations to the continental level. Leveraging cross-country political and implementation dynamics, and regional harmonization of digital agendas, also offer better chances of achieving the development objectives at hand sooner through economic integration. In 2017, Kenya held a ministerial conference on open data for agriculture and nutrition, where the Nairobi Declaration, a 16-article statement on open data policy in agriculture and nutrition, was signed by 15 African ministers. Francophone African countries have developed a similar network to support public policy development through CAFDO (*Communauté Afrique Francophone des Données*).[104] Such initiatives have the potential to unlock new entrepreneurship and development opportunities and their timely transposition into national law and systemic implementation can fast-track digital transformation of economies across the region.

Forward-looking national strategies in specific areas can complement holistic ones and support a more specialized development path – for example, leveraging AI or IoT integration across economic sectors, in smart cities, or robotics. As an example, Colombia's AI strategy aims to develop a dynamic and thriving AI market in Latin America, creating a laboratory for an AI market where designers, suppliers, intermediaries and consumers of this technology interact freely, facilitated by investment incentives to foreign and local entrepreneurs.[105] The National Strategy on Blockchain by the Ministry of Electronics and Information Technology (MeitY) of India has the ambition to create trusted national blockchain infrastructure that can be used to experiment with digital solutions for development and made available across the economy, in sectors such as finance, research and development, and government services and education.[106]

Moreover, monitoring and evaluation of government policies more generally lags in a vast majority of countries, blurring the blueprint of policy implementation, and failing to address new issues as they come up. In only one-third of countries, ministries or regulatory agencies conduct *ex-post* policy reviews;[107] and still fewer, one in eight, conduct rolling policy reviews.[108] Without systematic application of basic policy review instruments, keeping implementation on track becomes a challenge, and accountability suffers, to the detriment of users suffering digital divides.

Given the current global technological and economic disruption, countries are trying new approaches to defining digital policy agendas. A small group of countries has come together to craft comprehensive digital foreign policy strategies in order to stay at the forefront of digital transformation and outline a novel national approach to digital issues and digitization in relation to foreign policy. Beyond the national level, Canada, Denmark, Italy, Japan, Singapore, the United Arab Emirates and the United Kingdom have launched an intergovernmental regulatory collaboration network supported by OECD. Called 'Agile Nations', whose core mission is to help innovators navigate the complex regulatory landscape, test new ideas in collaboration

---

[102] European Commission. Digital Agenda for Europe.

[103] African Union. 2020. The Digital Transformation Strategy for Africa (2020-2030).

[104] Available at https://www.cafdo.africa..

[105] Government of Colombia. 2019. National Policy for Digital Transformation (AI Strategy).

[106] Government of India, Ministry of Electronics and Information Technology (MeitY). National Strategy on Blockchain: Towards Enabling Trusted Digital Platforms. 2021.

[107] A total of 61 countries, according to analysis based on the G5 Benchmark 2021.

[108] A total of 24 countries, according to analysis based on the G5 Benchmark 2021.

with regulators, and scale their innovation across digital and other emerging markets – all while upholding protections for citizens and the environment.[109] At the global level, the United Nations Secretary-General has laid out a Digital Cooperation Roadmap, in which all stakeholders play a role in advancing a safer, more equitable digital world – one that will lead to a brighter and more prosperous future for all. The roadmap is co-implemented by United Nations organizations, governments and the international multistakeholder community.[110]

On a similar path, the Government of Barbados has approved the establishment of the World's First Metaverse Embassy in 2021, a world-first for a government. Barbados' Metaverse Embassy will be at the centre of activities to advance the growth of stronger bilateral relationships with governments globally[111] through a digital-first approach yet to shape.

4.6   Strategy 5: Skill up, and up again

In the 'new normal', the speed of learning provides a competitive edge in business and technology.[112] This is true for national decision-makers and regulators, too. Problem-solving is impossible without building new skills and competencies, formulating strategic thinking around new issues in digital markets and implementing novel regulatory approaches. A focus on emerging skills is key to building adequate institutional capacity and preparing for current and future challenges.

Continuously upskilling people generates growth in the advisory role of ICT regulators into other sectors going through digitalization, and to citizens – while casting a wider net through initiatives such as innovation labs that help start-ups grow and work together, through digital mentorship schemes and communities of practice and research programmes.[113]

Metrics that matter and learning from regional and international best practices help regulators chart the shortest path to achieving policy goals. Benchmarks, econometric models and analytical tools can help improve the outcomes of regulatory decision-making by ensuring they are based on sound evidence and analysis.

Moving the needle

In the private sector, evidence from recent experience has shown that the level of digital skills has a positive impact on firm-level productivity in the service sector and for younger firms.[114] What's more, to facilitate the digital transformation and reap its benefits, workers across the board will need a broad set of skills. Recent analysis suggests that both cognitive (numeracy, literacy and digital) and some meta-cognitive skills (critical and creative thinking, learning-to-learn)

---

[109] Agile Nations. www.gov.uk/government/groups/agile-nations#:~:text=The%20Agile%20Nations'%20core%20mission,for%20citizens%20and%20the%20environment.

[110] United Nations, "Road map for digital cooperation: implementation of the recommendations of the High-level Panel on Digital Cooperation". 29 May 2020. www.un.org/en/content/digital-cooperation-roadmap/.

[111] Diplomat Magazine. https://diplomatmagazine.eu/2022/08/30/barbados-to-establish-the-world-first-embassy-in-the-metavesre/, 4 January 2023.

[112] See Leanstack. Available at https://leanstack.com/pages/continuous-innovation/part-2#:~:text=In%20this%20new%20world%2C%20speed.

[113] ITU. GSR Best Practice Guidelines 2019. Fast Forward Connectivity for All.

[114] Organisation for Economic Co-operation and Development (OECD). 2021. The impact of digitalisation on productivity: firm-level evidence from the Netherlands. Economics Department Working Papers No. 1680.

exhibit a strong and robust positive correlation with labour productivity.[115] Decision-makers – including policy-makers and regulators – are no exception, and regulatory expertise needs to be developed continuously to integrate new technologies, competencies and skills – and to allow for data- and evidence-based decision-making.[116]

International benchmarks for key policy and regulatory areas in the digital transformation can support the thinking process and road mapping of regulatory objectives. Evidence-based frameworks, such as benchmarks and advanced data analysis, can serve as a compass and a track record of practices across countries, regions and time, and can allow for comparison with international best practice.

4.7   Policy and regulation will enable digital transformation

Many of the challenges of the telecommunication sector at the time of the "Missing Link" report in 1984 are still with us – from investment in infrastructure to financing of access initiatives to institutional capacity of government agencies – but in the context of digital transformation, they are much harder[117] (see also Chapter 2).

Connectivity is an important policy goal – it enables economic development and access to education, and fosters entrepreneurship and innovation.

As digital markets grow and move towards everything-as-a-service, an agile and iterative, lean approach to policy and regulation has started to develop. Once a top-down, one-off process, policy and regulation have now become a living interface, enabling the interplay between consumer needs, the delivery of digital services and government priorities. The agency of regulators and policy-makers – their ability to do things that matter and evolve – and their agility, will be the keys to making the implementation of digital policies more impactful.

What's next? Policies will remain at the heart of the transformation aligning national and global development goals. The recovery from the global pandemic provides an opportunity to reframe policy, regulatory and legal perspectives, and redefine priorities of wholesome development in policy narratives. New fundamentals of digital policies – such as sustainability, innovation, inclusiveness in decision-making and accountability – will gain prominence and change the dynamics of policy design and implementation. The focus shifts from technologies to people – and from economic to the broader social impact on the ground. Long-term considerations guide policy direction, while short-term imperatives define regulatory tactics and implementation strategies.

---

[115] European Commission (2020). Facing the Digital Transformation: are Digital Skills Enough? Morandini, M.C., A. Thum-Thysen and A. Vandeplas. European Commission Directorate-General for Economic and Financial Affairs.

[116] ITU. GSR Best Practice Guidelines 2020: The gold standard for digital regulation.

[117] Kelly, T. 2022. Lead Digital Policy Specialist, World Bank. At the 8th Economic Experts Roundtable 'The role of Government and the Public Sector in post-COVID-19 digital world'. Outcome report.

5 A tale of five generations

5.1 It's a generation game

Over the past three decades, five generations of regulation have driven forward both the telecom market and digital technologies market. Each new generation has blended into the pre-existing landscape, pushing the boundaries of previous approaches and accelerating the pace of change into the future (see Box 6).

- **Gen 1 – outdated and rooted in command and control.** Gen 1 lasted the longest – and perhaps has been the hardest to break up – business operations, government decision-making and regulatory capacity have all been consolidated into a single static fixture. Gen 1 reflects the telecom sector at the time of the Maitland Report and before the WTO Reference Paper on basic telecommunications,[118] – a set of regulatory principles that is legally binding only for those WTO governments that have committed to it.[119] Twenty-five years later, only 17 countries worldwide are still anchored in Gen 1.[120]

- **Gen 2 – some core reform and regulatory disciplines.** Gen 2 has been characterized by core reforms: liberalization, privatization and the separation of the policy-making and regulatory functions of government. Following country commitments to the 1997 WTO Reference Paper and the GATS Annex on telecommunications,[121] more countries introduced regulatory disciplines: competition safeguards, interconnection guarantees, licensing and the independence of regulators. However, laying the foundations of open telecom markets throughout this phase has often been uneasy and slow. Currently, 56 countries remain in Gen 2.[122]

- **Gen 3 – changes paving the way for liberalized markets.** Gen 3 saw important core policy and regulation changes for liberalized markets fall into place and generated new market dynamics – competition and licensing frameworks and the enabling of spectrum regulation. Gen 3 laid the foundation for mobile cellular services and facilitated the take-up of a range of mobile technologies. The group of Gen 3 countries is fast shrinking. Governments around the world are realizing the potential of modern policy and regulation and graduating to Gen 4. Gen 3 numbers 53 countries today, with many readying themselves to take broadband, affordability and access to the next level.

- **Gen 4 – policy and regulation underwrite roll-out of digital infrastructure.** Gen 4 has seen policy and regulation enable rapid growth in the roll-out of digital infrastructure and in service adoption of mobile and fixed broadband – actively generating social and economic gains and laying the foundation of digitization across economic sectors. The 2008 financial crisis boosted Gen 4 as it offered a path to economic recovery through agile regulatory response, a collaborative governance approach, and was supportive of new social goals. A third of all countries have boarded the Gen 4 bandwagon in just the last decade.[123] Today, 67 Gen 4 countries are riding the wave of the Fourth Industrial Revolution, protecting consumer interests, opening up markets and advancing investment for social and economic development.[124]

- **Gen 5 – moving ahead on the digital transformation journey**. On a parallel track to the four generations of telecom sector reform, Gen 5 charts *the digital transformation journey* – from its inception to building a thriving digital economy and society. The journey witnesses a growing maturity of national legal and regulatory frameworks – from limited, to transitioning, to advanced, to leading (see Figure 2). On the way, national stakeholders increasingly align behind high-level policy leadership, with consistent policy implementation and fast-tracking progress to development goals, such as SDGs.[125]

---

[118] WTO. Reference paper on basic telecommunications.
[119] WTO. https://www.wto.org/english/tratop_e/serv_e/telecom_e/telecom_e.htm..
[120] According to analysis based on the ICT Regulatory Tracker.
[121] WTO. Annex on telecommunications.
[122] According to analysis based on the ICT Regulatory Tracker.
[123] Between 2007 and 2020, 61 countries were in Gen 4 in 2020, see ICT Regulatory Tracker.
[124] ITU. 2020. Global ICT Regulatory Outlook 2020.
[125] UN Sustainable Development Goals. The 17 Goals.

Box 6: The five generations of regulation

Regulators and policy-makers need evidence to inform their decisions as they seek to build a competitive, inclusive and resilient digital economy – evidence that helps them compare practices across countries and regions against a universal reference frame for regulatory excellence and good governance.

The 'generations of regulation' model enables them to do just that. It sets out, at a glance and across five clearly differentiated generations, how policy and regulation have evolved over recent decades – from a narrow focus on telecom, to the broader perspective on ICTs and then onto the gold standard for collaborative digital governance.6 The model has been built with the global community of ICT regulators – annually tuned and enhanced since 2003 by the Global Symposium for Regulators (GSR). The gold standard for digital regulation, Gen 5, embodies the guidance of this expert, high-level community and is framed under the premise 'collaboration across sectors, cooperation across borders, and engagement across the board'.

One of a kind, Gen 5 models how conducive policy, regulatory and governance frameworks for the digital transformation unfold, from Limited, to Transitioning, to Advanced, to Leading.

Generations of regulation model

Enabling digital transformation through policy, regulation and collaborative governance

Telecom regulation maturity

ICT Regulatory Tracker

G1	**GENERATION 1**	Command & control approach
G2	**GENERATION 2**	Early open markets
G3	**GENERATION 3**	Enabling investment & access
G4	**GENERATION 4**	Integrated regulation

Digital transformation readiness

G5 Benchmark

G5	**G5 LIMITED**	Narrow sectoral policy with no collaborative governance
G5	**G5 TRANSITIONING**	Piecemeal approach to digital policy
G5	**G5 ADVANCED**	Holistic approach to digital policy & governance
G5	**G5 LEADING**	Policy coherence & lean governance

The model is strategic and practical, enabling analysis of and planning for the evolution of national digital governance capacity and regulation. Two associated tools – the ICT Regulatory Tracker and the G5 Benchmark – underwrite the model in assessing the state of maturity of national legal frameworks and their governance, and tracking their progress over time.

Building on the Generations of regulation model, ITU has developed two complementary benchmarking tools, the ICT Regulatory Tracker[1] and the G5 Benchmark.[2] These help understand global trends and identify policy and regulatory gaps. The ICT Regulatory Tracker tracks the evolution of generations of telecommunication sector reform. In parallel, the G5 Benchmark charts the digital transformation journey from its inception to building a thriving digital society and helps countries establish roadmaps to navigate the digital transformation.

As digital markets integrate into core telecom infrastructure, legal, policy and regulatory frameworks for telecom and digital have evolved in parallel, at different speeds in countries and across regions.

- In the past, two separate frameworks have addressed issues associated with telecom and digital ecosystems as each of these areas mature – and two different tools are powerful aids in assessing them – the ICT Regulatory Tracker for telecom and the G5 Benchmark for digital markets.
- Increasingly, a new generation of such frameworks, Gen 5, enables digital ecosystems to gain traction and is helping accelerate progress across a broad range of development goals (see also Box 7 below).
- Using both tools mentioned above generates actionable insights and puts national decision-makers in the driving seat as they navigate the digital transformation of their economies and societies.

This integrated, augmented approach to the assessment of digital policy, development and implementation based on best practices[3] – and their localization – is rapidly becoming the gold standard for policy and regulation in the digital transformation.

Source: ITU.

---

[1]   See: G5 Accelerator, ICT Regulatory Tracker.
[2]   See: G5 Accelerator, G5 Benchmark.
[3]   ITU. 2019. GSR Best Practice Guidelines 2019, "Fast forward digital connectivity for all".

Evolution as diverging market expectations reconcile with broader goals of human development

Generations one through five have gradually shaped telecom and digital markets and more widely the economic sectors relying on them. It has been an evolution – not a revolution – and countries at all stages of market and regulatory maturity have been climbing the digital transformation ladder at a different pace while advancing telecom regulatory reform. This evolution has been marked by a constant quest to reconcile diverging expectations from the private sector, from established and new market players and from consumers – and aligning these with common goals of inclusive human development and sustainability, both at national and global levels (see Chapter 4).

5.2 Gen 5 – the baseline for agile, lean policy and regulation in digital transformation

In times of disruption, reframing policy and regulation can accelerate digital development across sectors, strengthen markets and improve the long-term economic and development outlook. But how to successfully navigate tensions and roadblocks?

The baseline for effective regulation has changed – and Gen 5 has become the reference framework for policy and regulatory readiness as digital transformation gathers pace.

5.3 Advocating for Gen 5 – three compelling arguments

Our advocacy for the value of the Gen 5 model as a tool for regulatory analysis and exploration can be distilled into three compelling arguments.

Argument 1. Gen 5, a clear shift in focus, scope, vehicles and approach to policy and regulation.

- The focus is on digital: Gen 5 policy and regulation have shifted focus from the narrow telecom sector to powering the digital transformation across the economy. Issues such as data protection and digital consumer protection, for example, are increasingly included within the purview of ICT regulators.
- Gen 5 places a premium on cross-sector instruments: Global, complex issues require cross-sector solutions and increasingly, digital technologies are part of such solutions. Digital policies cut across sectors and underpin their transformation, an invisible, essential layer of public service, industry and culture. For issues such as digital infrastructure investment and universal access to the Internet, policies and regulatory tools can trigger direct effects on the ground. For many others, legal levers can address key enablers that amplify impact and growth for the ecosystem as a whole. Such enablers have included 5G, 6G mobile, IoT for industrial development, and blockchain facilitating financial inclusion for the unbanked.
- Trade-off between rules and principles: Gen 5 marks a transition from rules-based to principle-based regulation, recognizing that the digital environment is more complex and requires a modular approach to market and consumer issues. Designing new rule-based regulatory frameworks in the absence of sound, realistic enforcement poses a credibility challenge – and renders more fraught the uneasy relationship between regulators and the regulated. For example, high-risk AI systems and digital platform content moderation are by design opaque and their native asymmetry of information vis-à-vis regulators is hard to bridge. On the other hand, issues with high financial and political stakes, such as taxation of digital platforms, are equally tricky to address at national level given their global nature.
- Broader regulatory options enable better response to change and challenge: New technologies and markets call for regulatory alternatives. More agile Gen 5 policy governance offers multiple paths through digital transformation. This generates opportunity for businesses and benefits for consumers, creating new vehicles to deliver government services – either replacing or complementing traditional instruments. Policy principles, industry codes of practice, regulatory opinions, or sandboxes – all providing safe space for experimentation – have become central to the regulatory workbox.
- Regulatory reform is more than just light-touch and de-regulation: Gen 5 is also about innovating within regulatory frameworks and reinventing instruments to keep pace with change – for example creating regulatory regimes for new technologies, applications and architectures, from cloud computing to artificial intelligence to digital assets. Importantly, it also requires the integration and harmonization of existing

and new frameworks, across sectors, as in the case of the sharing of infrastructure across telecoms, energy and transport.

- <u>Regional and global harmonization of competition and consumer protection rules is the 'significant other' of national regulations</u>: A puzzle of different, even contradictory legal regimes for activities such as e-commerce and cross-border data flows poses extra challenges to regional and global players and may put national digital economies at a disadvantage. Gen 5 calls for regional integration of national regulatory approaches to cross-border issues and compatibility between regional approaches.

- <u>Prevent rather than cure</u>: Gen 5 is a shift from 'regulation as remedy' towards more focus on managing the harmful effects of digital on consumers, markets and governments. This shift helps prevent regulation falling behind reality and helps align policy, regulatory reform and market development.

- <u>Seeing markets as ecosystems</u>: Gen 5 regulation challenges regulators to focus on an ecosystem approach – an approach built on an understanding of linkages between 'old' and 'new' technologies, services and business practices and how these impact markets and people – both in terms of benefits and harms. Greater stakeholder engagement throughout the policy process allows an understanding of their needs, trouble-shooting policy and implementation gaps – and tailoring regulatory options to local conditions and priorities.

Box 7: Regulatory strategy changes gear

Gen 5 encompasses the new, evolving policy and regulatory patterns that are shaping digital economies and societies (see figure below).[1] It is distinct from but complementary to previous generations as it encompasses the entire journey of transforming national economies and shaping national digital ecosystems. It amplifies the good governance principles which have been shaped through the previous generations and connects them into a new, more systemic and agile approach to policy and regulation.

Gen 5 marks a fundamental change in the way that governments develop regulatory frameworks, and importantly, how they implement them. Rather than one path through the digital transformation, Gen 5 offer multiple paths forward. An array of tools is at hand – from high-level digital strategies to collaborative governance to cross-sector legal instruments – converging towards common policy goals that match national contexts, political and legal systems, cultural backgrounds and economic priorities.

Gen 5 Lean Collaborative Digital Governance
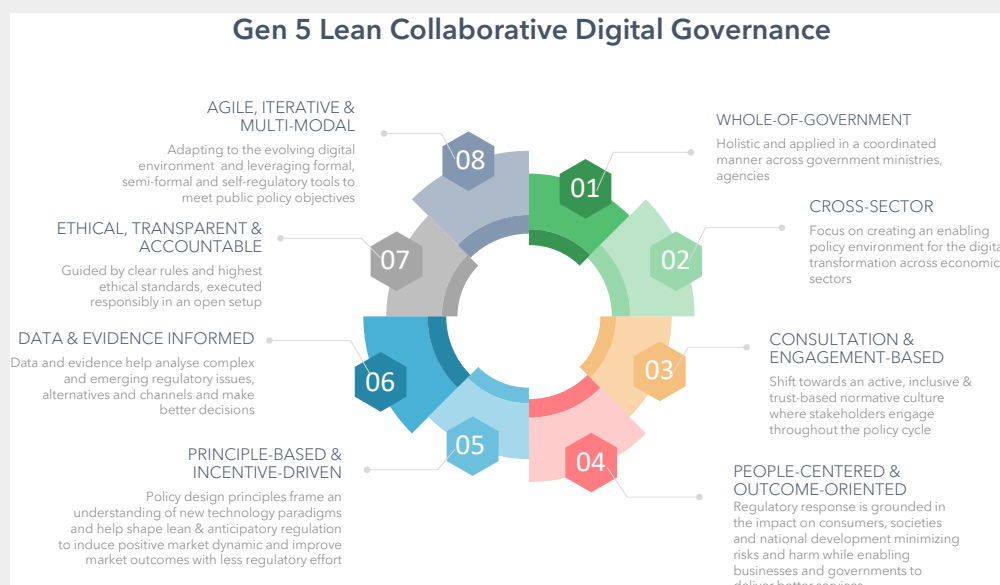
Source: ITU.

_____

[1]   ITU. 2020. GSR Best Practice Guidelines 2020, "The gold standard for digital regulation".

Argument 2. Gen 5 is dynamic – five elements define national readiness for digital transformation.

Gen 5 is a dynamic model, reflecting the interplay of five core elements defining national readiness for the digital transformation (see Box 8):

1. <u>Policy</u>. Policy guidance sets the mid- to long-term digital development priorities and political ambitions. Its ecosystem-wide approach to policy implementation orchestrates stakeholder strategies, programmes and funding instruments.

2. <u>Governance</u>. National collaborative governance, involving institutions, industry stakeholders, and cross-sector regulators, is the watermark of Gen 5 and the foundation of policy and decision-making. Cross-sector by nature, it calls for a whole-of-government approach open to national and regional stakeholders, from private sector to investors to consumer and industry associations to regional economic chapters and communities (e.g. in trade and cybersecurity). What's more, collaboration is the new norm – seamless, needs-based and outcome-based, whether formal or informal. Blended into standard governance processes, this collaboration ensures that current and emerging issues with digital markets are addressed in a timely way, lowering market barriers and creating value for consumers.

3. <u>Legal and regulatory</u>. Regulatory reform involves a regular cycle of normative reviews, leading to phasing out legal instruments that are no longer needed while identifying new regulatory priorities. Maintaining high regulatory standards drives competitive markets and lowers barriers to entry for greenfield players and consumers. Unnecessary regulation results in high compliance costs for entrepreneurs and high access and service costs for consumers, limiting market growth and stifling development opportunities.

4. <u>Implementation</u>. Policy implementation brings to life national policy goals and ambitions through operational mechanisms, generic or specialized programmes. Policy implementation involves a wide range of stakeholders and allows for the pooling of resources and the leveraging of expertise – aligning with high-level development goals and national policies in general.

5. <u>Culture</u>. Policy culture encompasses fixed conditions such as law and political systems – for example common, customary or religious law, republican or federal state or monarchy – and their evolving policy-making and decision-making (for example pluralism, the space for innovation and orientation towards results) and social norms (for example equality and equity standards, or freedom of expression). Policy culture is more stable than digital policy and governance frameworks and impacts them throughout the policy cycle. Policy culture is anchored locally and nationally, formally and informally.

Box 8: The five core elements of the Gen 5 framework

Gen 5 is built around five foundational pieces, revisiting traditional models of ICT regulation and elevating their interplay.

- A well-designed legal and regulatory regime guided by policy coherence across sectors supports digital market transformation that is inclusive and sustainable.
- Trusted, agile collaborative governance underpinned by innovation and results-orientation is the necessary precondition for aligning stakeholders with policy while pooling resources and leveraging their expertise in implementation.

The framework allows for striking a balance that works for governments, the private sector and citizens, and paves the way for digital transformation to achieve social and economic goals.

Gen 5 framework

Powering the digital transformation across government, society and the economy

Policy	Governance	Legal & Regulatory	Implementation	Culture
Setting national priorities & orchestrating stakeholder strategies	Transparent and agile, actively engaging stakeholders throughout the policy cycle	Uplifting the normative basis for digital markets,	Concerted efforts of all stakeholders, monitoring progress, adjusting to change	Law & political systems, patterns of policy and decision-making, social norms
01	02	03	04	05

Source: ITU.

Argument 3. Gen 5 embraces three decades of best practice and the move towards lean governance.

Gen 5 is guided by a 'North Star' design based on three decades of codified telecom and digital regulation best practices that form a gold standard for lean digital governance. Building on its landmark work in sector reform and in enabling environment for digital markets,[126] ITU co-designed the G5 Benchmark with expert and experienced stakeholders. The Benchmark is a frame of reference for good governance and an enabling legal environment, and sets goals for policy and regulatory excellence in the digital transformation. The G5 model elevates lean collaborative governance into a national asset – one that enhances competitiveness, inclusiveness and the transformative capacity of digital markets. Mastering tools to navigate change across the board is now of great importance for national decision-makers as they move to transform their economies and societies.

---

[126] ITU. GSR Best Practice Guidelines (all years).

The G5 Benchmark is one of a new breed of regulatory tools that gives a fine-grained view of the regulatory road already travelled and a vantage point to review future pathways:

- it reflects how digital transformation is shifting regulatory patterns;
- it reveals regulatory gaps;
- it creates custom-built roadmaps to navigate digital transformation;
- it facilitates high-value debate on the future of markets and regulation,
- it is based on unbiased, non-judgmental evidence.

Source: Adapted from ITU, Global ICT Regulatory Outlook 2020.

Benchmarks provide context and perspective for decision-makers

National and international best practices and benchmarks help decision-makers in understanding the principles and success factors of policy and governance reforms. They provide context and a broad perspective on cross-sectoral policies, allow comparisons across countries and policy areas, and help identify new patterns of policy and regulatory uplift – at national, regional and global levels. Benchmarks also help to substantiate correlations and causalities between multiple factors and events, they support the crafting of national strategies and regulatory roadmaps – and help with tracking progress though implementation.

It is now accepted that good governance and effective regulation boost market competitiveness and outcomes – and the G5 Benchmark has enabled us to quantify their catalytic effect and underpin further regulatory reform with confidence. Globally, Gen 5 countries – those with the highest levels of collaborative governance – outperform others in penetration levels both for mobile and fixed broadband (see Box 12). In 2022, Gen 5 Leading countries outperformed Gen 4 markets with 15 percentage point, on average, in terms of fixed broadband penetration and with 30 percentage point compared to mobile broadband penetration – while the gap between the Gen 4 and Gen 5 average Internet use was 19 percentage points.

Evidence-based approach taken to the next level

Building on the ICT Regulatory Tracker and the G5 Benchmark, ITU has developed a new evidence-based approach to assessing policy and governance frameworks, which is set out in Chapter 6 on regional trends.

Box 9: G5 Benchmark guiding regulators through uncertainty and disruption

The 2021 edition of the G5 Benchmark is structured around four pillars:

- **Pillar I: National collaborative governance** measures the breadth and depth of cross-sector collaboration between the ICT regulator, peer regulators and policy-makers. It factors in the institutional set-up (agencies and their mandates) as well as practices around regulatory collaboration, formal and informal, across 16 areas, including consumer protection, spectrum management, education and e-waste.
- **Pillar II: Policy design principles** focus on the design of frameworks and their coherence. As all sectors' regulation shifts from rules to principles, new elements have become paramount in ensuring that regulatory processes and policy implementation are delivering as they should – from applying tools for evidence-based decision-making, to providing space for regulatory experimentation, to strengthening the accountability of multistakeholder policy initiatives, to ethics.
- **Pillar III: Digital development toolbox** focuses on the tools needed by regulators to stimulate development of a sustainable digital economy. It considers new consumer needs, business models and market dynamics. The G5 toolbox spans areas such as cybersecurity, data protection, emergency telecommunications and cross-sector infrastructure sharing. The toolbox also includes universal instruments geared towards the achievement of mid- to long-term social and economic goals – such as youth employment and sustainable consumption and production – where digital has a central role to play.
- **Pillar IV: Digital economic policy agenda** features country policies and interventions for promoting the digital economy, entrepreneurship and investment. The areas covered range from an innovation framework to digital transformation to sector taxation and adherence to international and regional integration initiatives.

The G5 Benchmark features a total of 70 indicators focused on policy and regulatory frameworks that will best enable the digital transformation. According to their score, each of 193 countries is associated with one of four levels of national policy and regulatory framework maturity – these are Leading, Advanced, Transitioning, and Limited.

Tuning the Benchmark and its methodology has been a consultative, iterative process. Our 2020 pilot version benefited from feedback offered by regulators, regulatory experts and data scientists – this led to the expansion and rebalancing to better respond to the needs of national decision-makers. The updated Benchmark was then reviewed by an external independent expert board bringing together academia, international organizations, think tanks, regulatory associations and industry associations. This independent review provided final revisions and marked the coming of age for the G5 Benchmark.[1]

The G5 Benchmark covers in detail three of the five elements of the Gen 5 model: policy, regulatory reform and collaborative governance. In addition, it partially addresses policy implementation, to the extent that this can be quantified in a standardized way. Given the complexity and diversity of policy implementation options and policy cultures, these two elements can be usefully explored through additional tools, such as canvases and co-creation workshops.

Source: ITU, G5 Accelerator. Available at gen5.digital/.

---

[1]   ITU. Expert Report of the G5 Benchmark, March 2022.

Based on the tried-and-tested G5 Benchmark and the ICT Regulatory Tracker, we have developed a unified framework for assessing the state of readiness of national policy, legal and governance frameworks for digital transformation and supporting national ICT regulators in evidence-based decision-making. The following chapter demonstrates the unified framework and applies the new set of benchmarks to explore global and regional trends in key areas (see Box 10).

6   The state of digital regulation worldwide

6.1   Digital world: not yet available for everyone

The digital transformation of economies and communities can power new social and development opportunities even against the backdrop of the current global 'polycrisis'. From pandemics to recession to geopolitical conflicts and hunger crises to the climate emergency, digital remains a remedy to some of the radical challenges across the board and an urgent imperative for governments and markets.

Recent global events such as COVID-19 and the economic downturn it has helped trigger, has seen a wave of *ad hoc* policy response, including in the ICT sector and across the broader digital ecosystem. But is *ad hoc* policy response adequate in bringing countries back on track towards achieving digital development and the SDGs? New overlapping emergencies call for a more strategic, systemic and concerted approach to digital policy if we are to enhance public services, build long-term economic resilience, and spearhead innovation and social entrepreneurship over the mid- to long term. The pitfalls are many, from a lack of universal digital infrastructure to inefficiencies of cross-border competition in digital markets to the lack of digital skills for people, businesses and governments. Addressing the challenges across the board requires significant investment and synergies among stakeholders, which importantly, should align to policy goals.

6.2   Are we ready for the digital transformation?

National decision-makers are facing formidable challenges on the road to digital development. While countries are increasingly aware of the need for a shift in the focus of both digital and industrial policies, legal and institutional capacity for digital transformation in many developing and least developed countries remains insufficient.

In order to provide a single frame of reference for assessing the advancement of government efforts towards digital transformation, ITU has designed a unified framework and a set of benchmarks for enabling policy, legal and governance frameworks at the national, regional and global levels – which leverage the two established metrics for the maturity of policy, legal and governance frameworks for ICT and digital markets: the ICT Regulatory Tracker and the G5 Benchmark, both well-established tools. The overall 'Benchmark for policy, legal and governance frameworks enabling the digital transformation' assesses the level of national capacities and readiness for the digital transformation based on nine thematic benchmarks that offer insights into trends and gaps in specific areas, at a more granular level (see Box 10).

Box 10: Unified framework and benchmarks for policy, legal and governance frameworks enabling digital transformation

Digital transformation of economies and societies requires an enabling environment for both traditional telecom markets, digital markets and the enablers for digitization across economic sectors. A diverse set of complementary policy and regulatory tools and a wide range of governance structures can be leveraged to deliver such an environment, as well as universal meaningful connectivity and digital public services, while boosting digital innovation, value creation and economic opportunities.

Interplay between telecom and digital policy and regulatory instruments

Creating an enabling environment for digital transformation

through policy, regulation and collaborative governance

Digital policies

National digital strategies, operational initiatives, innovation framework

Telecom regulation

Infrastructure, universal access and user experience

Digital services & applications legal frameworks

Data protection, cybersecurity, e-commerce, Internet of things, Artificial Intelligence, cloud computing

In order to take a holistic view of the enabling environment for digital transformation, we have built a unified framework combining ITU's established tools for assessing policy, regulation and governance in telecom and in digital markets, the ICT Regulatory Tracker and the G5 Benchmark (see below). The unified framework provides a set of benchmarks that can be used to take stock of the readiness of countries for digital transformation and their policy, regulatory and governance capacity, enabling both a bird's eye view of global and regional trends and a deep dive into key areas. The analysis of the benchmarks enables regulators and policy-makers to make sense of their own situation compared to peers, while pinpointing strengths, gaps and priorities for future reforms.

Benchmarks for policy, legal and governance frameworks enabling digital transformation

ICT Regulatory Tracker
• Assessing the maturity of telecom/ICT regulation

G5 Benchmark
• Assessing national digital policies, legal and governance frameworks

BENCHMARKS FOR POLICY, LEGAL AND GOVERNANCE FRAMEWORKS ENABLING DIGITAL TRANSFORMATION

- NATIONAL DIGITAL POLICY AGENDA
- REGULATORY MANDATES
- GOOD GOVERNANCE
- COLLABORATIVE GOVERNANCE
- STAKEHOLDER ENGAGEMENT
- LEGAL INSTRUMENTS FOR ICT/TELECOM
- LEGAL INSTRUMENTS FOR DIGITAL MARKETS
- MARKET RULES
- REGIONAL & INTERNATIONAL COLLABORATION

Source: ITU.

42

Applying the new unified framework, we were able to quantify the readiness of national frameworks for digital transformation. At the global level, it would rate a score of 5 on a scale of 10, in 2022 (see Figure 2). Both developed and developing countries have come a long way in reshaping policies, institutional mandates and governance mechanisms as well as regulatory instruments to better leverage digital technologies and solutions for public good, but the work isn't complete. According to the benchmarks for key areas, significant gaps persist – requiring urgent attention by governments.

Figure 2: Policy, legal and governance frameworks enabling the digital transformation

Policy, governance and legal frameworks for the digital transformation, worldwide, 2022

Benchmark	Indicators
Digital transformation readiness (overall)	117
National digital policy agenda	13
Regulatory capacity	17
Good governance	11
Collaborative governance	16
Stakeholder engagement	5
Legal instruments for ICT/telecom	17
Legal instruments for digital markets	16
Market rules	17
Regional & international collaboration	5

Note: The nine thematic benchmarks are built from pillars and indicator subsets of the ICT Regulatory Tracker and the G5 Benchmark. The Benchmark for the enabling environment for digital transformation blends the two tools into a single framework.

Source: ITU.

In all regions and in most countries worldwide, the current state of the enabling environment does not provide sufficient leverage to public sector initiatives nor to private sector players to unleash the full potential of digital transformation. There is a stark contrast between the level of preparedness of developed countries in Europe and North America (at a readiness level of respectively 6.8 and 7.8 out of 10) and in developing regions ranging between 3.4 and 4.6 out of 10 in Africa, Arab States, Asia-Pacific and CIS, and 5 (close to the world average) in the Americas (see Figure 3).

Vast gaps divide the most and the least advanced countries in their digital transformation. While the readiness of Germany, Finland and Singapore is close to 9 out of 10, readiness of the world's least prepared countries, Tuvalu and Libya, is over 20 times less, at only 0.4 out of 10. Significant inequalities persist within regions too, with regional leaders being between three and 20 times more prepared than their least developed regional peers. Interregional gaps remain less significant in Africa and Europe – and most pronounced in the Arab States region and Asia-Pacific regions (also see Figure 3).

Figure 3: Readiness of digital policy, legal and governance frameworks for digital transformation, worldwide and by region, 2022

Overall readiness, woldwide and by region, 2022

World

Overall readiness: 5/10

Rank	Country	Readiness for digital transformation***
1	Germany	89%
2	Finland	88%
3	Singapore	87%
…		
191	Yemen	11%
192	Tuvalu	4%
193	Libya	4%

Africa
Overall readiness: 4.6/10

Rank/ Country	Telecom regulation (G1-G4)*	Collaborative digital governance, policy and regulation (G5)**	Readiness for digital transfor- mation***
1. Rwanda	G4	Advanced	77%
2. South Africa	G4	Advanced	75%
3. Kenya	G4	Advanced	73%
…			
42. South Soudan	G2	Limited	31%
43. Central Africa	G2	Limited	31%
44. Eritrea	G1	Limited	12%

Americas
Overall readiness: 5/10

Rank/ Country	Telecom regulation (G1-G4)*	Collaborative digital governance, policy and regulation (G5)**	Readiness for digital transfor- mation***
1. Canada	G4	Leading	83%
2. United States	G4	Advanced	83%
3. Chile	G4	Advanced	81%
…			
33. Antigua and Barbuda	G1	Limited	30%
34. Cuba	G1	Transitioning	28%
35. St Kitts & Navis	G2	Limited	27%

Arab States
Overall readiness: 4.1/10

Rank/ Country	Telecom regulation (G1-G4)*	Collaborative digital governance, policy and regulation (G5)**	Readiness for digital transfor- mation***
1. Saudi Arabia	G4	Advanced	86%
2. United Arab Emirates	G3	Advanced	79%
3. Egypt	G4	Transitioning	71%
…			
20. Djibouti	G1	Limited	13%
21. Yemen	G1	Limited	11%
22. Libya	G1	Limited	4%

Asia-Pacific
Overall readiness: 4.6/10

Rank/ Country	Telecom regulation (G1-G4)*	Collaborative digital governance, policy and regulation (G5)**	Readiness for digital transfor- mation***
1. Singapore	G4	Leading	87%
2. Australia	G4	Leading	86%
3. New Zealand	G4	Advanced	83%
…			
36. Nauru	G2	Limited	26%
37. Marshall Islands	G1	Limited	16%
Tuvalu	G1	Limited	4%

CIS
Overall readiness: 3.4/10

Rank/ Country	Telecom regulation (G1-G4)*	Collaborative digital governance, policy and regulation (G5)**	Readiness for digital transfor-mation***
1. Armenia	G4	Transitioning	66%
2. Russian Fed.	G2	Transitioning	59%
3. Azerbaijan	G2	Transitioning	57
…			
7. Tajikistan	G1	Transitioning	23%
8. Uzbekistan	G1	Limited	17%
9. Turkmenistan	G1	Limited	15%

Europe
Overall readiness: 6.8/10

Rank/ Country	Telecom regulation (G1-G4)*	Collaborative digital governance, policy and regulation (G5)**	Readiness for digital transfor-mation***
1. Germany	G4	Leading	89%
2. Finland	G4	Leading	88%
3. United Kingdom	G4	Leading	86%
3. Estonia	G4	Leading	86%
…			
44. Andorra	G1	Transitioning	30%
45. San Marino	G1	Limited	25%

Notes: * based on the ICT Regulatory Tracker, ** based on the G5 Benchmark, *** based on the unified framework.

For the full list of indicators in all Benchmarks, see Annex 2.

Source: ITU.

6.3   Legal and regulatory frameworks for telecom and digital markets mature at different speeds

Maturity of telecom regulation more advanced than of digital regulatory governance

Overall, and not surprisingly, the enabling policy and regulatory environment for the telecom sector is far better developed compared to specific requirements for digital markets. While countries worldwide have achieved 72 per cent on average of the baseline benchmark for telecom markets, the benchmark for digital policy and regulation is only half-achieved in 2022 (see Figure 4, left-hand chart). Both telecom and digital regulation frameworks are most advanced in Europe and least advanced in the CIS region.

Figure 4: State of telecom versus digital regulatory governance and regulation worldwide, by region, 2022
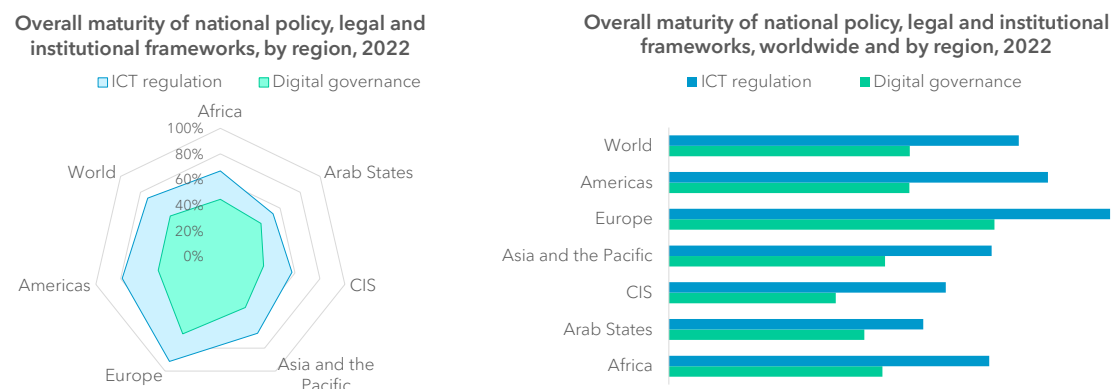
Note: 1) In the left-hand chart, the ICT Regulatory Tracker (Pillar 3 'Regulatory regimes') has been used as a proxy of the overall maturity of national regulatory and governance frameworks for the telecom/ICT sector. The G5 Benchmark (Pillar 4 'Digital economic policies agenda') has been used to assess the overall readiness of national policy, legal and governance frameworks for the digital transformation. 2) In the right-hand chart, the Benchmarks for regulatory instruments for telecom and digital markets are sub-pillars of the unified framework and combine relevant indicators from the ICT Regulatory Tracker and the G5 Benchmark. 3) The Benchmarks for regulatory instruments for telecom markets includes 17 indicators covering areas such as licensing, quality

of service, infrastructure sharing, VoIP use. 4) The Benchmarks for regulatory instruments for digital markets include 16 indicators covering areas such as data protection, digital applications, digital identity, e-commerce. For the full list of indicators in all benchmarks, see Annex 2.

Source: ITU.

The high average maturity of countries' core telecom regulatory instruments (from licensing to infrastructure sharing to spectrum trading) – above 60 per cent in 2022[127] – is an important prerequisite for affordable, reliable and diversified digital services. However, legal instruments for digital markets are fit-for-purpose in only around 40 per cent of countries worldwide[128] (see Figure 4, right-hand chart). Similar patterns drive uneven development of frameworks for telecom and digital markets in all regions. Europe stands out as the region with the most countries with advanced telecom instruments at 84 per cent – but even in Europe, only slightly more than half of countries have specific instruments for digital markets. Roughly half of countries in Africa, Arab States and Asia-Pacific have adequate instruments for telecom markets while around a third of countries in these regions have adopted regulatory tools for digital markets. CIS is the only region where the development of frameworks for telecom and digital services is uniformly developed – the overall level of development across the CIS region, however, remains low at less than 40 per cent.

Market rules: regulators can use both a carrot and a stick

The three pillars of enabling market rules – market structures, foreign ownership and competition safeguards. Clear and consistently enforced market rules matter in liberalized, competitive telecom markets, ensuring optimal outcomes for consumers, businesses and governments in terms of broader coverage, lower prices and diversified services. Presumably this does not apply directly to digital markets, where global monopolies detain significant market power over multiple national markets while they are not subject to national jurisdictions in the same way national telecom players are. A different approach to ensuring fair competition in digital markets is therefore required.

Market rules are well-formed in close to 60 per cent of countries worldwide and partially formed in another 15 per cent of countries, in 2022 (see Figure 5, left-hand chart). Competition rules have been steadily taking root in telecom markets for three decades, although discrepancies in their maturity across regions persist. Europe and the Americas are the only regions where the benchmark for enabling market rules is achieved at a level above the world average, with Europe again leading the way. Most Arab States and CIS countries are lacking sound market rules – and 40 per cent of them lack any rules at all for telecom and digital markets. Africa and Asia-Pacific are still below the world benchmark, but catching up at a steady pace.

---

[127] See Pillar 3 'Regulatory regimes' of the ICT Regulatory Tracker 2022.
[128] See Pillar 4 'Digital economic policy agenda' of the G5 Benchmark 2022

Figure 5: Conducive rules for telecom and digital markets, worldwide, 2022

Benchmark for enabling market rules, worldwide and by region, 2022

Competition safeguards and incentives, worldwide and selected regions, 2022
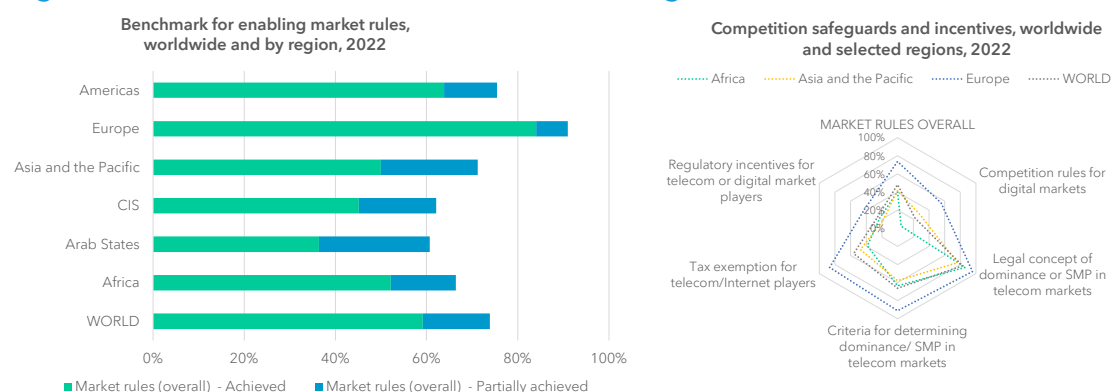
Note: The Benchmark for enabling market rules (left-hand chart) is based on relevant indicators from the ICT Regulatory Tracker and the G5 Benchmark and includes three components: level of competition/market structures (five segments and ownership of the incumbent operator); foreign ownership (six segments); and competition rules (also spotlighted in the right-hand chart).
For the full list of indicators in all benchmarks, see Annex 2.

Source: ITU.

Competition safeguards for telecom markets are well established in all regions (see Figure 5, right-hand chart). Market dominance is defined in four out of five countries worldwide and two out of three countries have specific criteria to enforce competition rules. A marked difference exists between Europe where nine out of 10 regulators have criteria defined for significant market power, and the CIS region where only one country has adopted such criteria.

Most regulators still prefer a 'stick' strategy to a 'carrot' strategy in both telecom and digital markets in 2022. Except in Europe and CIS countries, most countries in all other regions do not provide tax incentives for national telecom or Internet services providers (see Figure 5, right-hand chart), failing to recognize the potential of digital services for development. The percentage of countries in Europe providing such incentives is almost double that of most other regions, at 42 per cent. Beyond Europe and CIS, only 20 per cent of countries have introduced incentives to one or more categories of telecom or Internet service providers. This situation may undermine the alignment of regulatory instruments to high-level policy objectives and slow down the achievement of digital and sustainable development goals.

Importantly, competition policies for digital markets remain clearly underdeveloped in 2022. The world average of 20 per cent of countries with such policies masks significant discrepancies between regions (see Figure 5, right-hand chart). More than half of European countries have rules for competition in digital markets while only a third of countries in Asia-Pacific are equipped with such rules. What's more, EU countries have adopted a harmonized approach to competition in digital markets now laid out in the 2022 Digital Market Act, while in Asia-Pacific diverse approaches have been adopted, weakening the case for regionally harmonized rules so essential for digital transformation. Only 5 per cent of countries in Africa and the Arab region, 10 per cent in the Americas and not a single country in the CIS region have adopted enabling rules for digital markets. Competition safeguards and market rules for both telecom and digital services remain a stepping stone towards inclusive and equitable digital transformation and a priority for regulators and policy-makers.

## Digital policies need to be operationalized and connected to other sectors

Despite digital policies gaining momentum over the past few years, their adoption still remains at an early stage, behind traditional economic policies in many countries and their scope often remains partial. The benchmark accounting for the direction, scope and operational mechanisms of national digital policy agendas is only 43 per cent achieved at the global level (see Figure 6).

Some 88 per cent of countries worldwide have adopted a national digital policy or strategy as of the end of 2022. However:

- for two-thirds of these strategies, multiple economic sectors have been identified as key for national digital transformation and elevated to priority areas for government action;
- in only half of them [or 96 countries], are the national policies aligned with the SDGs, lacking a clear long-term development strategy;
- in only slightly more than one-third of all countries, operational mechanisms form part of digital policy, and lack implementation linkages – preventing them from hitting the ground running; and
- only one in seven strategies includes provisions for promoting digital inclusion of women and girls, and only one in five addresses persons with disabilities and young people – failing to recognize the diverse challenges vulnerable groups may face in becoming meaningfully connected.

While 169 countries worldwide have adopted a broadband connectivity plan targeted at the telecom sector in 2022, only 110 have an overarching digital agenda or digital transformation strategy. In all regions, at least two-thirds of countries have a broadband plan and at least half have a national digital strategy, except in the Americas region, where the proportion is slightly lower (see Figure 6, right-hand chart). The current trend of recently adopted policies focusing beyond the telecom sector and on the broader digital economy indicates that policy-makers increasingly see digital solutions as a prerequisite for achieving multiple development goals. Such policies, therefore, need to provide an operational toolbox for implementation and an alignment across sectors in addition to a high-level vision and goals.

Figure 6: State of national digital policy agendas, worldwide, 2022
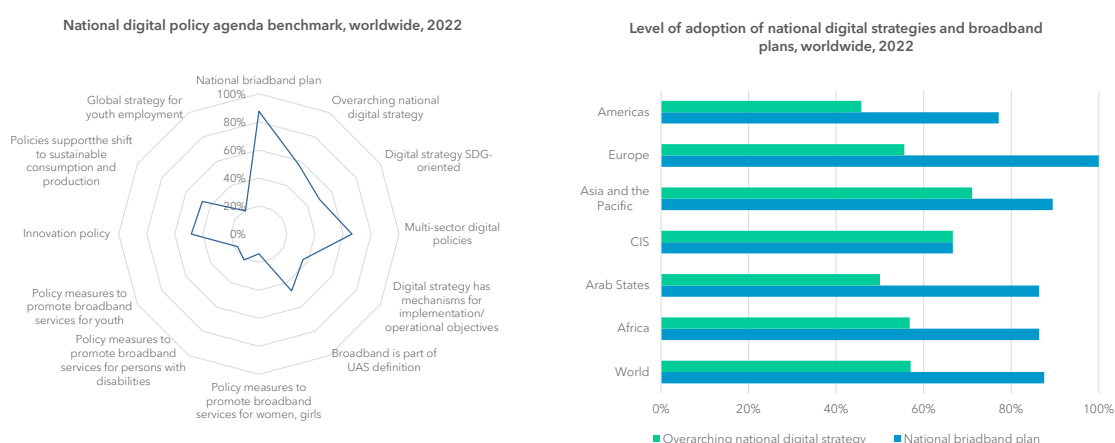
Note: The National digital policy agenda benchmark on the left is based on relevant indicators from Pillar 3 'Digital development toolbox' of the G5 Benchmark.
For the full list of indicators in all benchmarks, see Annex 2.

Source: ITU.

What's more, in addition to national digital strategies being a prerequisite for governments' efforts to accelerate the transition to digital economies and societies, they require a robust and diverse set of supporting policies and a high level of policy coherence across the board. In 2022, such supporting policies remain underdeveloped (see Figure 6, left-hand chart), jeopardizing whole-of-government efforts in digital development:

- fewer than half of all countries include access to broadband as part of universal access and service policies, recognizing universal meaningful connectivity as essential for social and economic empowerment – and therefore a policy imperative;
- fewer than half of countries worldwide have innovation policies in place, triggering positive dynamics in digital ecosystems to unlock entrepreneurship and technology innovation;
- fewer than half of all countries have adopted policy instruments aimed at supporting the shift to sustainable consumption and production or a coordination mechanism for sustainable consumption, advancing the transition to circular economies;
- fewer than a fifth of countries worldwide have developed and operationalized a global strategy for youth employment, or implemented the International Labour Organization's Global Jobs Pact that calls for the respect of fundamental principles and rights at work, strengthening social protection, promoting gender equality and encouraging voice, participation and social dialogue – allowing a positive spillover effect into the digital job market.

Such supporting policies are paramount for the impact of digital policies and are instrumental in their implementation. Without them, countries may struggle to address challenges across economies and societies and their progress to sustainable and inclusive digital development slowed.

6.4   Collaborative digital governance makes a real difference

Institutional landscapes are well developed but often siloed

Digital governance builds on three main pillars – regulatory capacity determined by institutional capacities and mandates; good governance practices; and collaborative governance among government agencies in charge of aspects of digital transformation.

Regulatory capacity invested in autonomous regulatory agencies – a proxy for more efficient governance models – stands out as the most advanced area of national digital governance frameworks.

The benchmark for regulatory capacity accounts for the highest level achieved among all thematic benchmarks at 63 per cent, due in no small part to the fact that such agencies have been in existence for decades. In contrast, the benchmark for good governance is only half-achieved and the one for collaborative digital governance, the bedrock of meaningful and outcome-driven institutional action in the digital transformation, scores as low as 40 per cent (see Figures 2 and 7).

Figure 7: Institutional landscapes, worldwide, 2007 and 2022

Institutional capacity of ICT regulators, worldwide, 2022

Regulatory mandates, worldwide, 2022
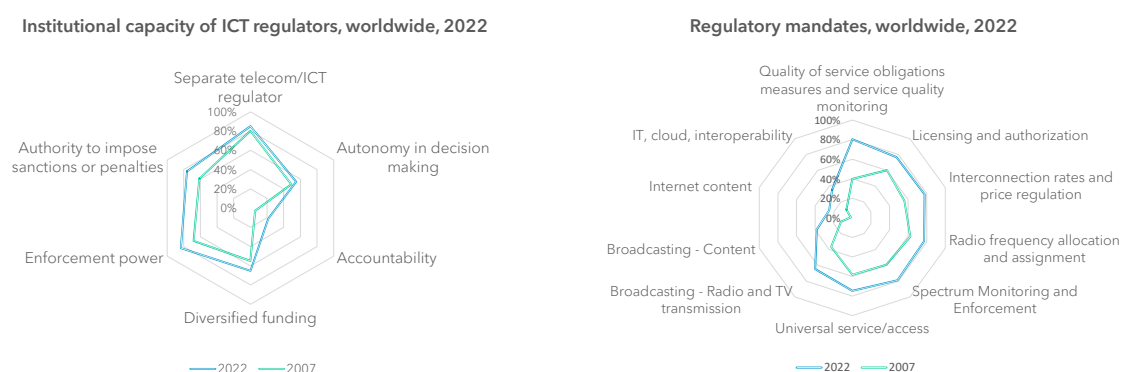
Note: The Benchmark for institutional capacity of ICT regulators on the left is based on relevant indicators of Pillar 1 'Regulatory Authority' of the ICT Regulatory Tracker. The Benchmark for regulatory mandates on the right is based on Pillar 2 'Regulatory mandates' of the ICT Regulatory Tracker.

For the full list of indicators in all benchmarks, see Annex 2.

Source: ITU.

Institutional capacities of ICT regulators have barely evolved over the past decade and a half, between the 2008 global economic crisis and the 2022 so called 'polycrisis'. Apart from the merging of a handful of previously independent telecom/ICT regulatory authorities into the sector ministries (e.g. in Indonesia and the Republic of Korea), and the creation of some new authorities (e.g. in Ethiopia and Somalia), national institutional landscapes have remained stable. One positive trend that has gained momentum is the strengthening of enforcement powers and the authority of ICT regulators to impose sanctions on market players. Regrettably, hardly any progress has been made towards more autonomy in regulatory decision-making and in the granting to ICT regulators diversified sources of funding to limit the risk of capture. Despite a strong movement towards more accountable institutions and a four-fold increase, today fewer than a quarter of countries worldwide have sound accountability mechanisms regarding the appointment of the agency head or commissioners, reporting requirements and annual budget approvals.

Regulatory mandates have evolved steadily since 2007 and a large majority of ICT regulators have strong traditional mandates in core areas such as licensing, interconnection, price regulation, spectrum management, and universal access and service. Mandates for ensuring the quality of service and experience have seen the highest growth, doubling the number of countries by 2022. New mandates have evolved at a similar pace to traditional mandates, yet remain underdeveloped. Apart from the surge in the number of converged regulators overseeing both the telecom and the broadcasting transmission sector, the other areas are covered by regulatory mandates in fewer than half of countries worldwide. Increasingly intertwined, the areas of broadcasting and Internet content are in the purview of around one-third of ICT regulators. Critical but under-recognized areas include cloud computing and IT services – these are covered by regulatory mandates in one-third of countries, mostly members of OECD.

## Good governance: a complex but decisive balancing act

Good governance practices across government ministries and regulatory agencies are essential for impactful policy implementation and for achieving development goals.

In some areas of activity, telecom/ICT regulators have been applying good governance principles more systematically than other government agencies. For example, dispute resolution and appeal mechanisms are well established for the telecom sector in nine out of 10 countries worldwide while only 40 per cent of countries have fully functional appeal mechanisms across economic sectors (see Figure 8, left-hand chart). Regulatory impact assessments are regularly used to inform major decisions of ICT regulators in half of countries worldwide, and occasionally in a further 10 per cent of countries. ICT regulators' decisions are subject to general administrative law in over 70 per cent of countries, allowing for consistent delivery of regulatory mandates.

Monitoring and evaluation of government agencies' efforts stand out as the major area in need of improvement as regards good governance practices. Only 30 per cent of countries worldwide require *ex-post* reviews of sectoral policies and only 10 per cent require policy rolling reviews. Without a clear understanding of the implementation level, the challenges and changing contexts, the achievement of policy goals may be at risk. Today, governments have more data, evidence and evaluation tools at their fingertips than ever before – and the failure to use them to guide policy implementation can have important negative consequences not only for government agencies, but for citizens and business alike.

The situation in the regions is similar and most remain below the world average of 50 per cent of countries achieving the good governance benchmark, with the notable exception of Europe where two-thirds of countries have good governance rooted in whole-of-government operations (see Figure 8, right-hand chart).

Figure 8: State of good governance worldwide, 2022
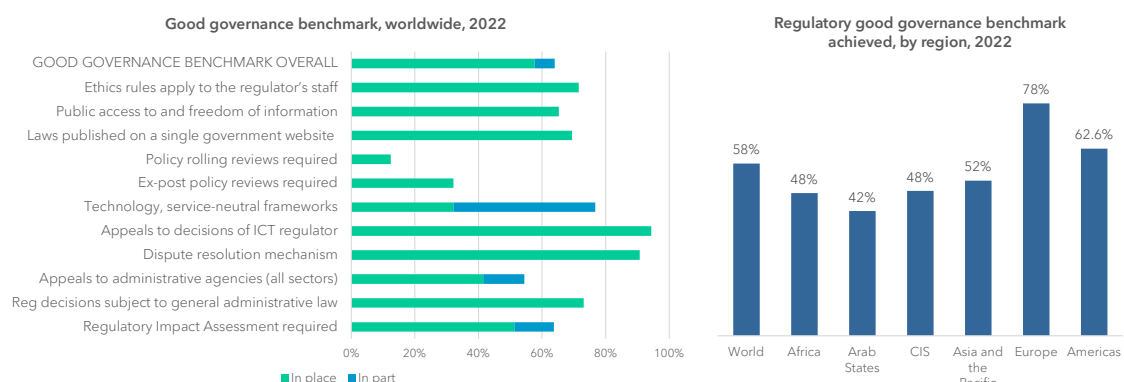
Note: The Good governance benchmark is based on relevant indicators from Pillar 1 'Regulatory Authority' of the ICT Regulatory Tracker and Pillar 2 'High-level policy design principles' of the G5 Benchmark.
For the full list of indicators in all benchmarks, see Annex 2.

Source: ITU.

Collaborative digital governance gains ground, slowly

In most countries worldwide, multiple agencies have been established with mandates over digital transformation issues. They have been tackling the challenges of telecom markets and navigating digital transformation in order to unleash new benefits and opportunities for people, governments and businesses. Despite the many efforts under way, many agencies fail to reach for and achieve whole-of-government and outcome-oriented collaboration.

> ## Box 11: What is the difference between collaborative digital regulation and collaborative governance?
>
> Collaborative digital regulation or fifth generation regulation (Gen 5) is a broad notion that ITU has defined
>
> based on the concept of generations of ICT regulation (see Box 6). It marks a fundamental shift in the way regulation is executed and the stakeholders that it brings together – from policy-makers, single-sector and multi-sector regulators to market players of any size. The concept also refers to the set of new tools used by regulators to tackle the issues related to digital transformation and digital development.
>
> Collaborative governance puts consumer benefits and development outcomes in its focus and leverages the resources of government institutions and industry to deliver them, through organic consultation, collaboration and conciliation. Collaborative governance refers to the ICT regulator working closely with peer regulators in other sectors. It is defined by:
>
> 1. The breadth of collaboration – whether the ICT regulator collaborates with authorities in charge of competition, consumer protection, finance, energy, broadcasting, spectrum management and Internet issues;
> 2. The depth of collaboration – whether regulators have engaged in informal, formal collaboration, or have put in place other hybrid mechanisms.
>
> Both concepts are linked and reflect the interplay of institutions and regulatory frameworks in regulating telecom and digital markets, and creating an enabling policy, legal and regulatory environment for digital transformation.
>
> Source: ITU.

The level of collaboration among sectors is uneven – contrasting patterns occur across the board (see Figure 9). The ICT regulator collaborates most often with:

- Spectrum agencies, competition and consumer protection authorities, in 80 per cent of countries or more. The collaboration with spectrum agencies is almost always formal, as such formality is required for the issuing of spectrum authorizations, while most of the collaboration with competition and consumer protection authorities is informal, needs-based and contextual.
- Broadcasting and postal authorities, cybersecurity agencies, financial regulators and national coordination bodies for digital transformation or the information society in at least half of countries worldwide. The collaboration is more often formal, with the exception of the national coordination agency.

The ICT regulator collaborates the least with:

- Data protection authorities and computer emergency response teams (CERTs) when they are not part of the ICT regulator, in fewer than half of countries worldwide. This is plausibly one of the areas most in need of strengthened collaboration, as issues as diverse as data governance, digital platform content moderation and cross-border data flows call for joint reflection and, in some cases, action of regulators.
- Transport and energy regulators, with respectively 64 and 54 per cent of regulators worldwide not engaging in any sort of collaboration. With both transport and energy infrastructures being pivotal for the achievement of universal meaningful connectivity in both developed and developing countries, strengthening the collaboration between regulators stands out as a matter of priority.

There are marked differences between the level of regulatory collaboration across regions too. Only a quarter of Arab States ICT regulators collaborated with data protection agencies in 2022, while three-quarters of European regulators did so. In the Africa region, two-thirds of ICT

regulators collaborate with financial regulators opening the way to market of digital financial services, compared to fewer than half of ICT regulators in the Americas.

Figure 9: The state of collaboration between the ICT regulator and other sector or cross-sector regulators, worldwide, 2022

Collaboration between the ICT regulator and other sector or cross-sector regulators, worldwide, 2022
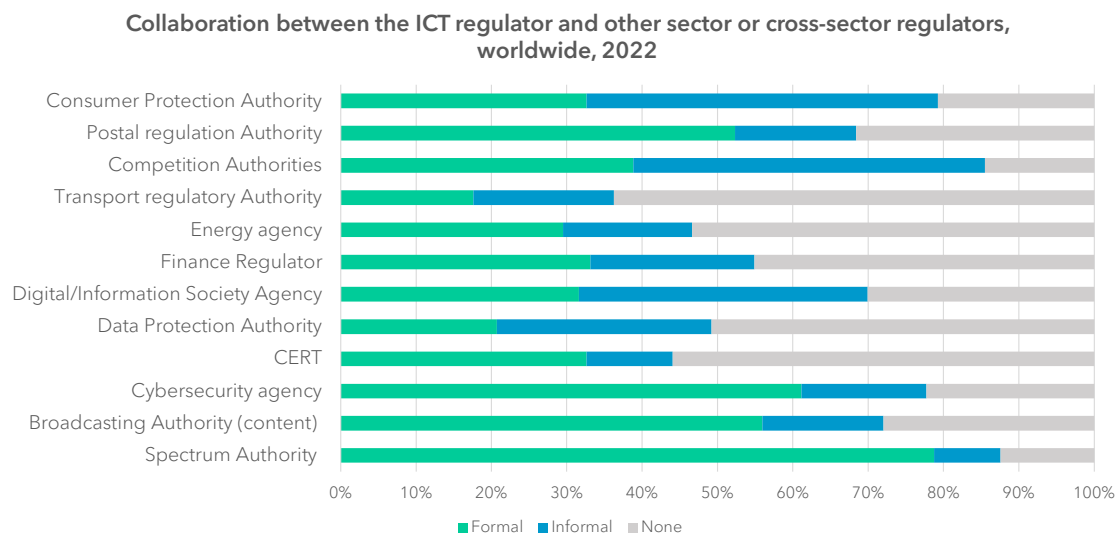
Note: Formal collaboration occurs based on a Memorandum of Understanding between agencies or on the basis of a legal act (e.g. law, decree, regulatory decision). Informal collaboration occurs outside of a specific legal framework.
For the full list of indicators in all benchmarks, see Annex 2.

Source: ITU.

Collaboration between the ICT ministry and other government ministries is prevalent in two-thirds of countries worldwide. There is little difference in the level of inter-ministry collaboration at the global level in the areas of health, education, environment and the economy, with two-thirds of countries engaging in either formal or informal collaboration (see Figure 10, left-hand chart). Formal collaboration is the most common in this context, occurring in roughly half of countries worldwide in 2022.

The regional picture however is mixed and important discrepancies persist among developed and developing regions (see Figure 10, right-hand chart):

- In the area of digital health, collaboration between ministries occurs in 88 per cent of Europe as opposed to only 11 per cent in the CIS region.
- In education, half of African ministries collaborate compared to 90 per cent in Europe.
- On environmental issues, 40 per cent of Arab States engage in collaboration at the ministerial level versus close to 70 per cent of Americas countries.
- Collaboration on matters of economic development is twice more likely to occur in Europe than in Arab States.
- Formal collaboration is more common in all regions and in all areas, except Arab States collaborating informally more often than formally on digital health issues.

Figure 10: Collaboration between the ICT ministry and other ministries, worldwide, 2022
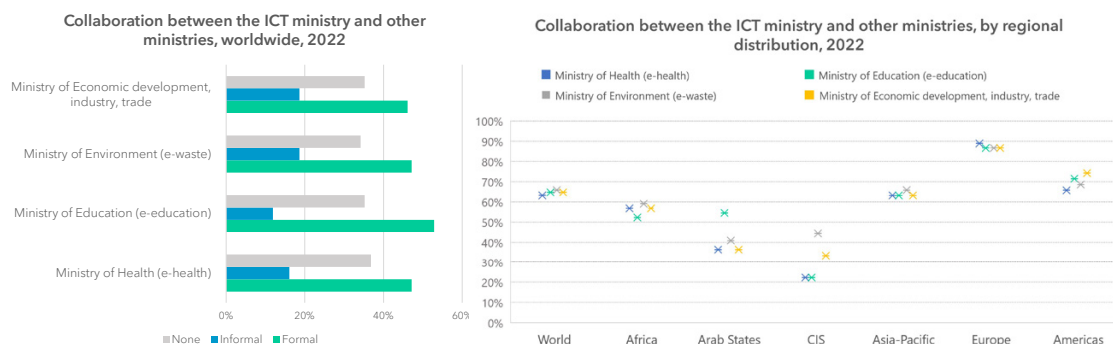
Note: The right-hand chart shows combined levels of formal and informal collaboration between the ICT regulator and the respective ministries.
For the full list of indicators in all Benchmarks, see Annex 2.

Source: ITU.

This snapshot of the state of collaboration shows a movement towards a collaborative 'new normal' mindset of policy-makers and regulators. However, not all regions or areas are equally collaborative. Further efforts need to be made to expand the reach of collaborative governance practices while shifting focus towards outcome-based and needs-based collaboration, and fast-tracking administrative red tape for greater impact.

Room for improvement in national and international stakeholder engagement

Digital policy and regulation cycles can benefit from broad participation and input from a wide range of stakeholders, including market players, academia, civil society, consumers, end users, and relevant government agencies (see also Chapter 4).[129] Stakeholder engagement and consultation processes result in a better informed, more rigorous, and more accountable decision-making process – making it a stepping stone of the success of policy implementation.

The lowest scores go to the stakeholder engagement and international cooperation benchmarks, both achieved at around 35 per cent at the global level (see Figures 2 and 11), leaving ample space for improvement at the national, regional and international level.

Practices in these areas vary considerably across regions though:

- Europe is the most advanced region in both areas, achieving some 75 per cent of the international cooperation benchmark and 44 per cent of the one for stakeholder engagement.
- For Africa, Arab States and Asia-Pacific regions, the benchmarks for international cooperation are achieved at only 20 per cent, a level inadequate to enable regional integration of digital markets. The considerable gap between the level of engagement on the regional and international level among regions suggests the need for further regulatory harmonization across borders to allow the spillover effects of digital access to benefit all people. In Arab States, all regional indicators are below the world average, while in Europe they are considerably higher.

---

[129] ITU. GSR-19 Best Practice Guidelines (2019), https://www.itu.int/en/ITU-D/Conferences/GSR/2019/Documents/GSR19BestPracticeGuidelines_E.pdf; ITU, GSR-20 Best Practice Guidelines (2020), https://www.itu.int/en/ITU-D/Conferences/GSR/2020/Documents/GSR-20_Best-Practice-Guidelines_E.pdf.

- Africa shows the highest level of regional integration with affiliation of all countries on the continent to the regional ICT chapter, the African Telecommunication Union. Their regional indicators in the other areas are, nevertheless, close to or below world averages.

- Compared to the international picture, the regional levels of national stakeholder engagement converges more across regions, with most regions relatively evenly distributed vis-à-vis the world average.

- A major pillar of national stakeholder engagement, public consultations are required in two-thirds of countries ahead of major regulatory decisions, but in only a fifth of all countries have clear rules, timelines and procedures been established to ensure that consultations are adequately used to gather and reflect on stakeholder views. This is a key area for improvement in some 80 per cent of countries worldwide.

- In the context of digital transformation, regulatory alternatives gain momentum and are increasingly required to cope with disruptive technologies, business models and events. Tools for regulatory experimentation such as telecom or fintech sandboxes and industry codes of conduct are being tested in all regions. Their use is, however, limited for the time being and more prevalent in some regions such as Asia-Pacific, Arab States and Europe.

Figure 11: National, regional and international stakeholder engagement, worldwide and in selected regions, 2022

Note: The Benchmark for stakeholder engagement mechanisms in the left-hand chart is based on relevant indicators from the ICT Regulatory Tracker and the G5 Benchmark. The Benchmark for regional and international cooperation in the right-hand chart is based on relevant indicators of the G5 Benchmark.

For the full list of indicators in all benchmarks, see Annex 2.

Source: ITU.

6.5   Booming telecom regulation, lagging digital policy enablers

Telecom regulation evolves steadily, but not fast enough

Looking narrowly at the ICT sector, the *ad hoc* policy and regulatory response triggered by the COVID-19 pandemic has accelerated the transition of countries to higher generations of telecom/ICT regulation. In 2022, 73 countries have achieved G4, a 16 per cent increase compared to the end of 2019 (see Figure 12, left-hand chart). The group of G3 countries has remained stable in numbers, at around a quarter of all countries, with some G2 peers graduating to G3 over the duration of the pandemic while formerly G3 countries graduated to G4. The group of G2 countries currently accounts for another quarter of all countries worldwide while the G1 group has remained unchanged, failing to put to work policy strategies to remedy the consequences of the multiple crises over the past three years. All in all, a third of the world's

countries are lagging significantly behind and failing to create an enabling environment for mobile and Internet markets.

Figure 12: A third of countries worldwide have created an enabling environment for telecom markets, 2022
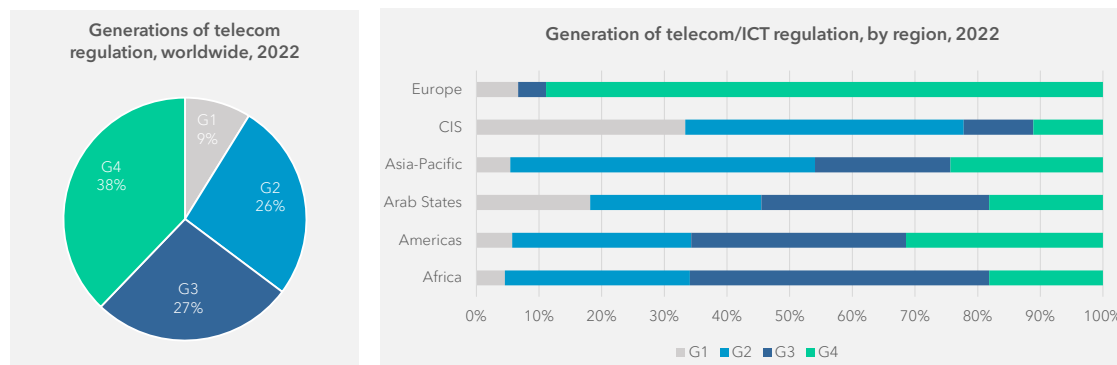
Note: Generations of regulation are based on ICT Regulatory Tracker scores:
G1: 0 < 40 ; G2: 40 < 70 ; G3: 70 < 85 ; G4: 85 ≤ 100.

Source: ITU.

At the regional level, there is uneven development in the level of maturity of policy and regulatory frameworks both between and within regions (see Figure 12, right-hand chart). While 90 per cent of European countries are in G4, only a third of countries in the Americas and fewer than a quarter of countries in the other regions have achieved an enabling environment for telecom/ICT markets. Half of countries in the African region are in G3 while in the Asia-Pacific, half of the region remains in G2. Arab States count the highest number of G1 countries, while half of the region is in either G3 or G4.

Overall, Europe is the most advanced region in the area of telecom/ICT regulation while CIS is the least. Europe is also the only region where the average scores of countries meet the G4 threshold, Africa and the Americas are in G3, and Asia-Pacific, Arab States and CIS – in G2. The overall world average falling mid-way through G3 masks important inequalities both within and among regions.

Digital policy and regulation lacks leverage in developing countries

Enabling ICT sector-specific regulation associated with the most advanced generation, G4, is a pre-requisite for vibrant digital markets and more accessible, affordable and meaningful digital services. G4 regulation builds the core support layer for cross-sector policy and legal frameworks – and without which digital solutions in all sectors cannot be generated. Anchored in G4, the G5 Advanced and Leading collaborative governance models driven by a whole-of-government set of policies, cross-sector legal instruments and governance mechanisms are required to uplift countries' readiness for digital transformation.

But despite increasingly loud public narratives underlining the importance of leveraging digital solutions for social and economic development, only slightly more than a third of countries worldwide is at the Leading or Advanced level of preparedness, with policy, legal and governance frameworks fit for digital transformation. Over 40 per cent of countries have started the transition from sector-specific towards cross-sector policy, legal and governance models but reforms have so far been partial and piecemeal. Strikingly, a quarter of all countries

disposes of only limited digital [government] capacity. Two-thirds of countries are failing to create an enabling policy and governance for digital development,[130] and if the current trend persists (see Figure 13), many developing and least developed countries may be unable to unlock the development potential of digital services and solutions, falling short of meeting the SDGs by 2030.

Figure 13: The state of telecom and digital policy and regulation worldwide, 2022
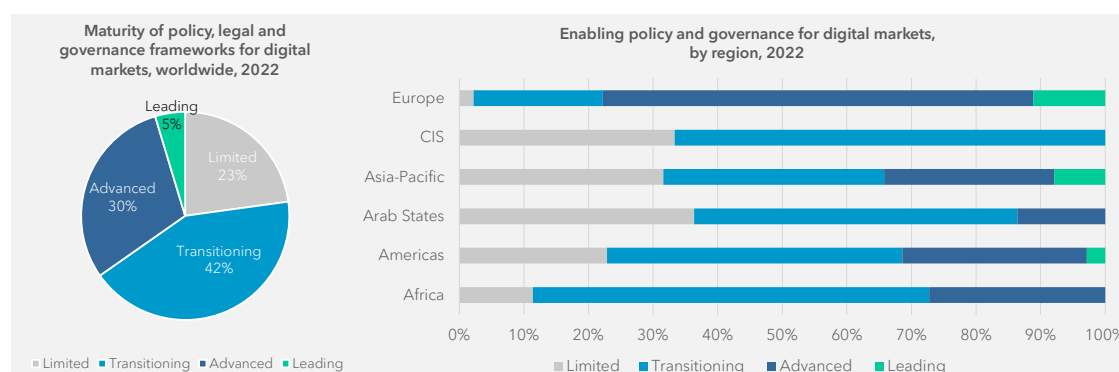
Note: The levels of maturity of policy, legal and governance frameworks for digital markets are based on country scores of the G5 Benchmark:
Leading: 0 < 30 ; Transitioning: 30 < 60 ; Advanced: 60 < 80 ; Leading: 80 < 100.
For the full list of G5 Benchmark indicators, see Annex 1.

Source: ITU.

The development of digital policy, legal and governance frameworks across and within regions is markedly uneven. Two-thirds of European countries have achieved an Advanced level of maturity compared with the majority of countries in all other regions split between the Transitioning and Limited group. Fewer than a third of countries in Africa, Asia-Pacific and the Americas is in the Advanced group. Among Arab States, only one in six has achieved Advanced maturity and none of CIS countries has made it so far.

Only nine countries – fewer than 5 per cent of countries worldwide – are currently equipped with mature national frameworks for digital markets enabling them to become leaders in transformational development of digital economies and societies. Germany, the United Kingdom, Canada, the Republic of Korea, Singapore, Estonia, Finland, Australia and the Netherlands have the most enabling digital policy and governance models as of 2022,[131] already transforming their economies and societies through new economic solutions and creating new social opportunities (see Box 12).

---

[130] At the Limited and Transitioning stage.
[131] According to the G5 Benchmark 2022.

Box 12: Digital transformation gaining momentum in Leading Gen 5 markets

Good regulation amplifies digital development and accelerates the achievement of social and economic goals, as demonstrated in the previous editions of the Global ICT Regulatory Outlook report.

Gen 5 regulation appears fully fit-for-purpose in piloting economies through digital transformation towards broad, inclusive and meaningful connectivity.

In 2022, Gen 5 countries outperformed all others substantially – including Gen 4 markets:

- Leading Gen 5 markets boast a mobile penetration level 30 percentage points higher than Gen 4 countries, on average, exceeding the universal service level.
- Leading Gen 5 markets also displays penetration rates twice as high as the world average and over 60 per cent higher than G4 peers, clearly charting a path forward for years ahead.
- Leading Gen 5 markets also enjoy Internet usage that is 19 percentage points higher, on average, than Gen 4 countries and over 30 percentage points higher than the world average.

Leveraging nearly universal meaningful connectivity, Leading Gen 5 economies and societies are reaping the benefits of accessible, affordable and diverse digital services and solutions. Development imperatives urge more countries to step up their efforts and advance collaborative digital regulation.

Comparison of ICT market performance, averages for G4 and G5 countries and world, 2021
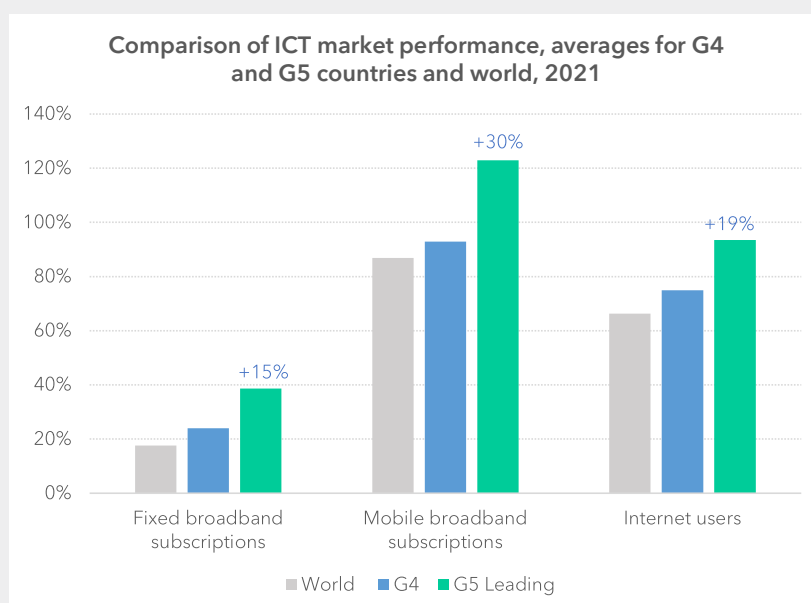
Note: The percentages indicated in blue refer to the delta between the average penetrations in G4 compared to G5 countries.

Source: ITU.

6.6 Collaborative digital regulation drives social and economic benefits[132]

Stronger collaborative digital regulation is associated with faster growth of the digital sector, which is expected to translate into spillover gains for the overall economy, at both the macro and micro economic level.

---

[132] Based in part on ITU Journal on Future and Evolving Technologies. Dr. Raul Katz and Dr. Juan Jung, Collaborative digital regulation: a much-needed approach to achieving growth of the digital economy. https://www.itu.int/pub/S-JNL-VOL3.ISSUE2-2022-A25.

When observing the relationship between the G5 Benchmark on one side, as a proxy of the maturity of collaborative digital governance, and GDP per capita on the other side, as a measure of macro-economic outcome, the exponential nature of the correlation might indicate a potential return to scale (see Figure 14, left-hand chart). In other words, once countries reach a G5 score of approximately 60 – equivalent of the entry level of the Advanced group – economic growth triggered by the development of the digital economy begins to increase at a faster pace. On the other hand, the logarithmic correlation between the G5 Benchmark and the Doing Business index could indicate that once a certain threshold is reached (for example, the value of 50 in the Doing Business index), the increase in market outcomes for businesses would undergo a gradual saturation (with diminishing returns, see Figure 14, right-hand chart). This is an important caveat, reminding us that enabling legal and governance frameworks for digital transformation are indispensable but not sufficient to unlock the full array of social and economic benefits. Consistent implementation and enforcement, strong stakeholder engagement and political stability are equally important for driving inclusive digital markets and achieving digital development milestones.

Figure 14: Correlation between collaborative digital regulation and economic outcomes

Note: Due to the lack of extended data series, the econometric analyses here and below present some limitations. As the G5 Benchmark has only been developed for 2020, it is not possible to estimate a panel-data model, and relies instead on a cross-section specification for a single year. This is an important limitation, as in the absence of a panel, it is not possible to control for unobservable country-level effects affecting the variance in the scores of the different indices. While the correlations shown in this descriptive analysis seem to be strong enough, it is still necessary to find out if they are robust within econometric models.

Source: ITU Journal on Future and Evolving Technologies, Dr. Raul Katz and Dr. Juan Jung, Collaborative digital regulation: a much-needed approach to achieving growth of the digital economy, https://www.itu.int/pub/S-JNL -VOL3.ISSUE2-2022-A25

When exploring the correlation between collaborative digital regulation and meaningful digital connectivity proxied by the Network Readiness Index[133] and the Digital Maturity Index[134] (see Figure 15), the message couldn't be clearer. The exponential tendency of the correlation suggests a return to scale, meaning that as the G5 score reaches a certain threshold, an incremental change in the enabling environment would accelerate connectivity gains (this threshold is close to a G5 score of 60 in the case of the Digital Maturity Index and as low as 40

---

[133] The Network Readiness Index measures the degree of digital transformation of the economy. This index, originally developed by INSEAD and later by Cornell University, is based on four fundamental dimensions: Technology, People, Governance, and Impact.

[134] The Digital Maturity Index, developed by Telecom Advisory Services for CAF Development Bank for Latin America, is based on five pillars: Digital Foundations, Digital Talent, Digital Innovation, Adoption, and Localization.

for the Network Readiness Index). This finding substantiates the strong interplay between the improvement of regulatory environments and the advancement of digital infrastructures, on one hand, while corroborating the quality and performance of digital legal and governance frameworks with the improvement in terms of meaningful connectivity and national digital capacities (including digital skills, entrepreneurship and innovation) on the other.

Figure 15: Correlation between collaborative digital regulation and connectivity

Note: Due to the lack of extended data series, the econometric analyses here and below present some limitations. As the G5 Benchmark has only been developed for 2020, it is not possible to estimate a panel-data model, and relies instead on a cross-section specification for a single year. This is an important limitation, as in the absence of a panel, it is not possible to control for unobservable country-level effects affecting the variance in the scores of the different indices. While the correlations shown in this descriptive analysis seem to be strong enough, it is still necessary to find out if they are robust within econometric models.

Source: ITU Journal of Future and Evolving Technologies, Dr. Raul Katz and Dr. Juan Jung, Collaborative digital regulation: a much-needed approach to achieving growth of the digital economy, https://www.itu.int/pub/S-JNL -VOL3.ISSUE2-2022-A25
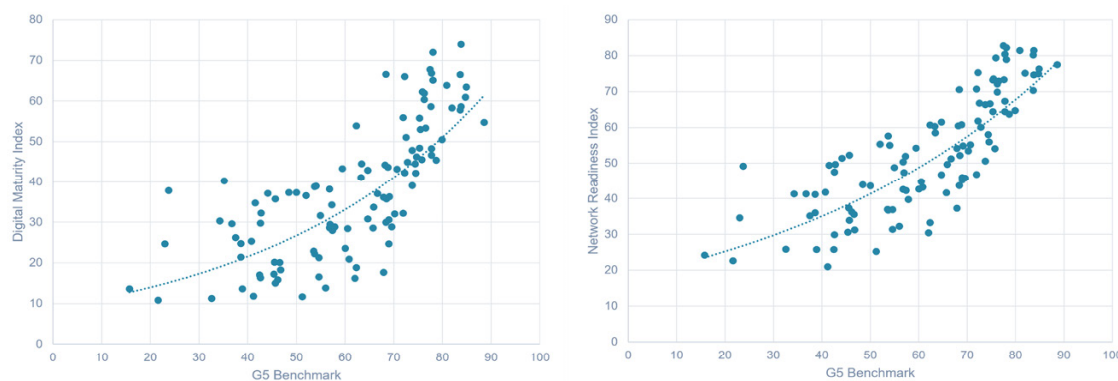
Similarly to connectivity, e-government maturity and innovation dynamics also appear to be to a great extent defined by the level of collaborative digital governance. The correlation between G5 scores and the measures of e-government readiness and innovation (proxied by the E-Government Index[135] and the Global Innovation Index[136]) shows that countries would only reap the full benefit of both e-government services and digital innovation ecosystems if they were to reach a relatively high level of collaborative digital regulation (above a G5 score of around 70 corresponding to the Advanced or Leading level of readiness for digital transformation, see Figure 16). Below this critical threshold, both the efficiency of e-government services and the incentives for entrepreneurship may be slow to develop and remain limited in reach. Also, it is revealing to cross-compare the three areas of regulation, public service delivery and innovation together as there are strong implementation links and mutual influences among them. Innovation and regulation are both levers for digitization and the improvement of e-government delivery while digital regulation and governance trigger innovation ecosystem dynamics, either strengthening or impairing the ecosystem.

---

[135] The E-Government Development Index, developed by United Nations (UN), was designed to present a country-level state of e-government by assessing the website development patterns in each economy as well as infrastructure and educational levels.

[136] The Global Innovation Index, developed by the World Intellectual Property Organization (WIPO), sheds light on the state of innovation financing. While this index is focused on innovation, we can expect a more digitized environment to be positively linked to it.

Figure 16: Correlation between collaborative digital regulation, e-government maturity and innovation dynamics
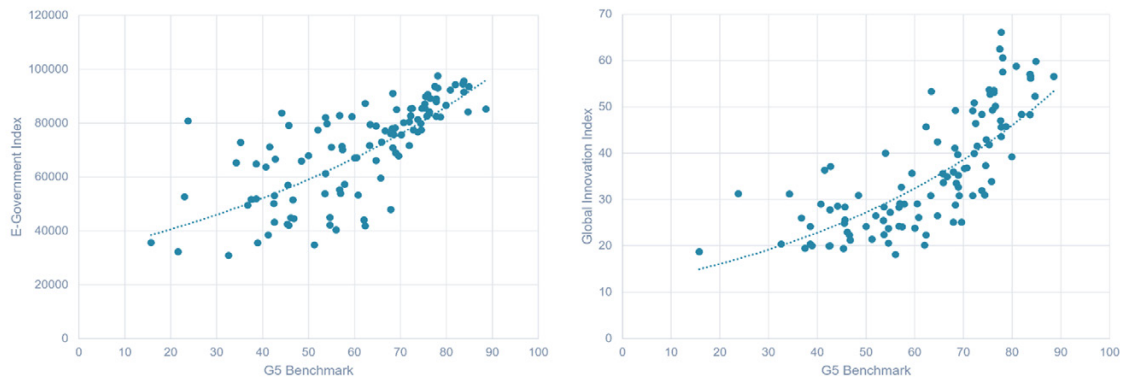
Note: Due to the lack of extended data series, the econometric analyses here and below present some limitations. As the G5 Benchmark has only been developed for 2020, it is not possible to estimate a panel-data model, and relies instead on a cross-section specification for a single year. This is an important limitation, as in the absence of a panel, it is not possible to control for unobservable country-level effects affecting the variance in the scores of the different indices. While the correlations shown in this descriptive analysis seem to be strong enough, it is still necessary to find out if they are robust within econometric models.

Source: ITU and ITU Journal of Future and Evolving Technologies, Dr. Raul Katz and Dr. Juan Jung, Collaborative digital regulation: a much-needed approach to achieving growth of the digital economy, https://www.itu.int/pub/S-JNL-VOL3.ISSUE2-2022-A25

Overall, there is a strong correlation between collaborative digital governance and key areas such as connectivity, entrepreneurship, innovation and the broader digital economy. Analysis suggests that collaborative digital regulation is associated with positive outcomes across areas that impact on digital transformation, with important development outcomes. A the lack of cross-institutional coordination, however, can be identified as a critical barrier to policy coherence and regulatory consistency, and a threat to meaningful digital development.

6.7   Different development paths

The development of policy, legal and governance frameworks for telecom and digital markets follows a similar trend in the majority of countries worldwide (see Figure 17 below):

- G1 countries most often have limited readiness for digital transformation.
- The G2 group is split between the Limited and Transitioning category with low level maturity of their legal and governance frameworks.
- The majority of G3 countries are still transitioning to higher levels of digital maturity.
- Most G4 countries are equipped with Advanced digital governance capacity and a handful of them are leading the digital transformation globally (G5).

Figure 17: Mapping of the generations of telecom/ICT regulation and the levels of development of digital regulation, worldwide, 2022
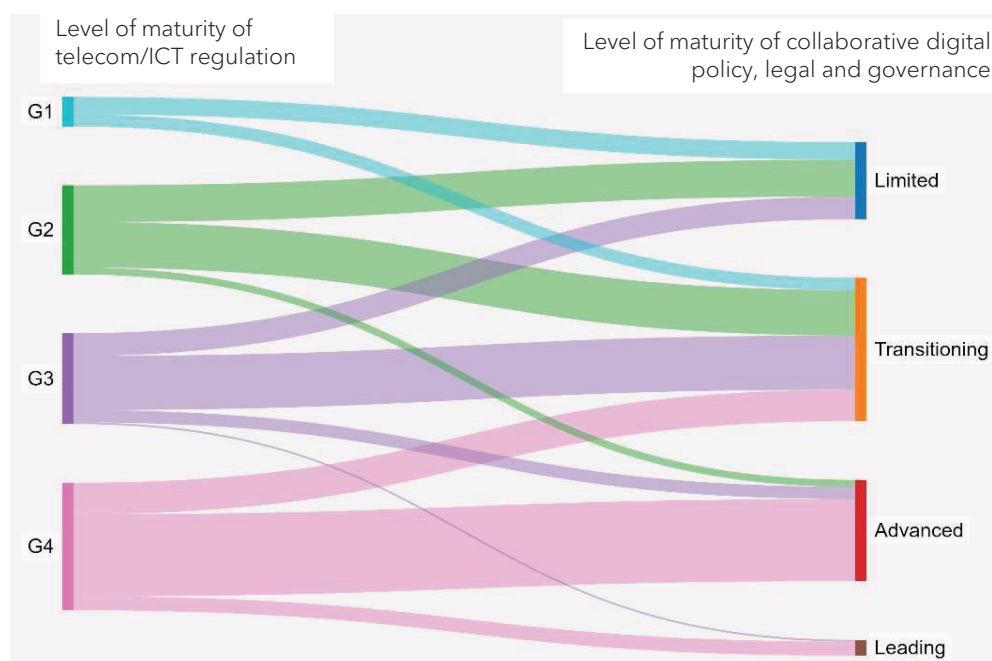
Note: The graph is based on the ICT Regulatory Tracker (left-hand side) and the G5 Benchmark (right-hand side). The full profiles for 193 countries are available on the G5 Accelerator.

Source: ITU.

There are nevertheless notable exceptions to the general trend.

- Among the Leading G5 countries, the Republic of Korea has followed a different path in developing national telecom markets and is still in G3 mainly due to the lack of a separate ICT regulator, a converged licencing framework, and important limitations to foreign ownership.

- A handful of Asia-Pacific countries is still lingering in G2. China has not established a separate ICT regulator, applies restrictions to foreign ownership and doesn't allow open access to global VoIP platforms. Indonesia, the Philippines and Sri Lanka lack essential infrastructure sharing rules, and number portability requirements. Despite that, they are all in an Advanced level of preparedness for digital transformation driven by consistent policy frameworks for digital development and the highest political commitment.

- Around 10 per cent of countries worldwide as diverse as Armenia, the Bahamas, Bulgaria, Jordan and Malawi are only at the Transitioning stage of readiness for digital transformation despite having achieved the highest level of enabling environment for telecom markets. While they are yet to realize the full potential of digital markets, they have a solid basis [G4] to build in digital transformation capacity in their legal and governance frameworks.

6.8   New good practices and evolving trends in digital transformation[137]

The analysis of policy, regulatory and governance trends in the context of digital transformation enables us to assess where a country stands in terms of the development of national capacity

---

[137] Based in part on ITU Journal on Future and Evolving Technologies, Dr. Raul Katz and Dr. Juan Jung, Collaborative digital regulation: a much-needed approach to achieving growth of the digital economy. https://www.itu.int/pub/S-JNL-VOL3.ISSUE2-2022-A25.

and the agency of institutions, while pinpointing areas that need to be emphasized as they chart a path to the future.

In the midst of old and new challenges posed by global and regional trends, the need for cross-institutional coordination and collaboration calls for a single policy and regulatory focus in the digital economy domain.

How can this be achieved?

Countries should migrate away from a restricted view of telecommunications, and even ICT regulation and policy to an expanded scope of the digital economy, which incorporates innovation, science and technology, telecommunications infrastructure, among key areas of interest. This new view requires the development of observatories that monitor indicators across development of the digital sector and digital transformation of the economy.

What's more, regulators and policy-makers should incorporate as a conventional course of action the implementation of regulatory impact tools that capture all digital economy dimensions in a systematic fashion. The development of enhanced tools for conducting regulatory impact assessment should be supported by a recognition that the development of the digital economy is based on multiple interrelationships between digital infrastructure (networks, data centres, and the like), connectivity (access devices), household digitization (which comprises issues such as affordability and digital literacy), digitization of production (including mature and advanced technologies, such as artificial intelligence and Internet of Things), digital talent and general skills of the labour force, and the development of digital industries and platforms. All these components are highly synergistic, which means that policy development becomes more complex requiring not only better analytical tools but also improved technical and social science capabilities among policy-makers.

From an institutional standpoint, countries at the leading edge of constructing collaborative regulation frameworks have implemented high-level national coordination bodies which comprise not only representatives of the different agencies and ministries, including sub-sovereign parties, but also private sector participants.

While inter-institutional coordination is a key requirement for policy and regulatory collaboration, policy coherence is not only fulfilled by cross-institutional coordination but also through proactive action of the executive branch at its highest level. In some countries, the President, the Prime Minister, or a collegial body reporting to the highest levels of government proactively pulls the different agencies together through agenda setting, goal formulation, and implementation monitoring processes. This high-level political commitment brings all agencies and institutions together in fulfilling collaboration.

Collaborative digital regulation needs to be underlined by holistic economic policy considerations. Under the proposed cross-institutional framework, countries should have the capability to assess trade-offs, and make policy decisions by examining the multiple economic dimensions while keeping the development of the digital economy as their North Star.

7   Nine issues on every regulator's radar screen

In a world in constant flux, policy- and decision-makers have a key role in supporting the digital transformation of economies, and not least, by ensuring sustainable finance for development projects that is critical to successfully achieve SDGs. This task involves the transformation of policy-making processes, governance models and establishing new channels for policy implementation. Many of the old issues are still with us, but they are more complex – while new issues emerge with the rise of new technologies. How should we keep up with the pace of innovation and disruption?

This chapter provides some broad-brush, high-level thinking on nine issues that every regulator should have on their radar. We do not suggest that each issue needs regulation, but analysis indicates they deserve your attention and monitoring as each develops.

Each of the insights below responds to fundamental questions such as:

•   What are the specific issues related to every topic?
•   Why does it matter?
•   What are the regulatory options at hand?

The insights set out to raise questions that are important and relevant, inviting further thinking and debate to help evolve regulatory approaches as we move forward through the digital transformation.

7.1   Challenges in Internet regulation

Regulating the Internet more broadly, as well as individual digital technologies, throws down some unique challenges for regulators. These include:

-    ***Ex-ante or ex-post regulation***. Regulators can generally try to regulate in advance (*ex-ante*) to avoid or limit future problems (e.g. competition law preventing mergers and acquisitions, aiming to prevent any single company from becoming too dominant), or they can engage in more retrospective (*ex-post*) regulation, trying to rectify a problem that has already arisen (e.g. forcing the sale of a subsidiary or brand). Neither model, however, can effectively address Internet-related issues alone.
-    ***The borderless nature of the Internet***. To take one example, Facebook users, amounting to 2.96 billion monthly active users (MAU) by Q3 2022, now account for around 37 per cent of the total global population, active in nearly every country of the world. How can individual national regulators regulate platforms with global reach?
-    ***The speed of evolution of technologies***. Technological innovation moves fast. Regulators and lawmakers may not always adapt at the same speed. In 2015, the average age of national information society laws, broadband plans, and digital agendas already amounted to seven years. Such laws are rarely updated or renewed anywhere near as fast as the associated technology.
-    ***Existing silos and the hybrid nature of some technologies***. Are data and privacy issues in telemedicine a problem for health regulators, privacy regulators or ICT regulators? Should connected cars be regulated by highway agencies or by ICT regulators? Are growing regulatory issues relating to crypto assets a problem for financial or ICT regulators? Today, many digital technologies effectively bridge several historical silos, necessitating an unprecedented degree of collaboration and cooperation between regulators.
-    ***Different angles to the same challenges***. Issues like anonymity, identity and privacy present cross-cutting challenges for regulators in different fields. Regulation can consider these issues from: a technical perspective (e.g. security and authentication – is the right

person accessing the right parts of the network?); from an efficiency perspective (e.g. how accurate is facial recognition at correctly identifying people?); a rights perspective (e.g. are the rights of individuals to anonymity and privacy adequately protected?). Big data can yield vital insights (mortality and sickness rates for insurance) that must sometimes be traceable back to individuals (e.g. cancer diagnoses, COVID or HIV test results). National security concerns may call for tracing, tracking and identifying persons of interest from within a huge population. Can countries maintain their national security without compromising individuals' rights to anonymity and privacy?

- *Future issues and 'downstream' challenges of the Internet and ICTs.* And who is dealing with pending or future issues, some of which are already becoming apparent? Will the metaverse replace or run alongside the Internet? Who will regulate that? Overarching issues such as job substitution of computers for human workers, the carbon emissions from ICTs, the 'right to be forgotten' – who is dealing with global issues starting to take on global proportions?

7.2   Cybersecurity

What are the issues and why does cybersecurity matter?

If connectivity is the economic cornerstone of society, then cybersecurity is the keystone of digital transformation. In fact, the promotion of digital infrastructure security fosters confidence and trust for the whole digital ecosystem.

In addition to the high costs related to cybersecurity incidents in the private sector (which incentivizes telecom/ICT players to adapt) and consumers, cyberthreats also represent a great risk for national security. Unfortunately, cybersecurity is not yet a top priority when it comes to consumer choice, however, regulators are acting with increasing frequency in this area.

What are the regulatory options at hand?

Telecom/ICT regulators have different mandates and there is no one-size-fits-all solution pointing to the right course of action. The growth of cybersecurity challenges across sectors underlines the need for collaborative regulation, while traditional approaches can't be left aside either. The real challenge for regulators is to balance these different approaches in order to minimize the risks.

Where the regulator has a limited mandate for cybersecurity, there is still a role to be played. Traditional regulation and new collaborative tools can improve the security and resilience of the networks, such as initiatives that ensure cybersecurity governance by operators, foster best practices, diagnose and mitigate threats, promote information sharing and protect critical infrastructure.

Another important area relates to equipment. Momentum is building towards certification, labelling and assurance schemes with the aim of guaranteeing that products available on the market meet minimum requirement criteria. In addition to this, supply chain risks and supplier diversity are undoubtedly topics to keep on the radar.

Nevertheless, one thing that regulators need to keep in mind is that any action must take into consideration the different roles and responsibilities of stakeholders within the sector. Furthermore, the needs and resources of SMEs have to be considered when establishing any mandatory requirements to avoid provisions that create disproportionate burdens for them. In

this context, it is very important that regulators use a dynamic approach – adjusting the intensity of actions and adapting at the speed that the challenges demand.

Last, but not least in importance, is the dimension of awareness, which plays an essential role in the prevention and mitigation of incidents. Awareness approaches have to be examined and encouraged by regulators, taking into account the needs and risks faced by vulnerable groups, such as children and older people.

To sum up, cybersecurity is another domain that demands action by regulators. While there is no single off-the-shelf solution, there is room for regulators to adapt their actions and initiatives according to context and landscape, as well as taking into account the different tools available and the nature of the cybersecurity risks.

7.3   Is it possible to regulate artificial intelligence?

Regulators around the world are considering how best to regulate artificial intelligence (AI) or AI applications. However, there are several challenges involved when dealing with AI:

1. ***How to define AI***. AI encompasses a broad set of technologies, systems, software, algorithms, applications or even models. There are general (broad) and narrow definitions of AI, which may also be embedded into or account for part of an overall system (but not all of it). For example, popular applications of AI include facial recognition systems, self-driving cars, neural networks, photo or object identification, translation and search software, and text chatbots. In terms of commonalities, most applications (and definitions) of AI include some element of self-learning or autonomous systems. The OECD has defined an AI system as "a machine-based system capable of influencing the environment by producing an output (predictions, recommendations or decisions) for a given set of objectives".

2. ***Black boxes and AI models evolve over time.*** How do AI models learn and function? There are plenty of anecdotal stories about 'black box' models, where researchers are not entirely sure why their models reach the conclusions they do. Faced with self-learning systems that evolve over time, and considerable uncertainty as to why – or how – they evolved in certain directions, it may become very difficult to 'regulate' (guide or direct or impose limits and constraints over) neural network or self-learning models.

3. ***Regulating for the world as it is, or should be – bias in applications***. Many AI applications learn about the world as it was or is, rather than aspirations about how it should be. Imagine an AI system analysing the vast literature of historical biographies or books. Although human population has clearly comprised equal numbers of men and women throughout human history, such a model might well arrive at the conclusion that the human population has historically comprised a vast majority of men – despite extraordinary accomplishments by many women in history. Similar examples of bias in AI analysis include improved health AI applications for white individuals as opposed to ethnic minorities in the US and elsewhere; gender bias in AI recruitment applications (more likely to recommend men for senior roles, based on real-world datasets); improved accuracy of facial recognition models for lighter skin tones. Seeking to set standards for the datasets on which AI models are trained involves a policy choice about trying to regulate for the world as it actually is (containing many implicit and non-conscious biases) or for the world as it should be (including aspirations of equality and equity).

These are just a few of the reasons why 'regulating artificial intelligence' models, technologies or applications might actually prove impossible in practice, and why most regulators and lawmakers finish up introducing high-level principles for 'ethical' applications of AI to deal with the downstream consequences of AI models.

High-profile examples of guidance on AI development include the European Commission's Communication on AI and Ethics Guidelines for Trustworthy AI; the OECD's Principles for AI, adopted in May 2019; and the UNESCO Recommendation on the Ethics of Artificial Intelligence, adopted in 2021. How might AI impact a common bill of digital human rights and responsibilities or calls for a Universal Declaration of Digital Human Rights, guided by fundamental universal human values?

In terms of detailed standards and practical efforts, policy-makers and legislators can introduce standards for the datasets on which AI or machine learning models are trained. So, in the example above, a historical dataset might include literature weighted towards including female historical figures or a health regulator might require healthcare providers to publish details about the dataset used (percentage of ethnic minorities included) or weight the data for real-life proportions.

Overall, regulatory approaches to and strategies for AI clearly need to evolve fast, to keep up with the technological developments and regulators need to monitor and consider the implications – present and future – of this fast-moving area.

7.4 Online financial services – growing calls for the regulation of cryptocurrencies

What are the issues?

Today, crypto assets form a financial system that is interlinked with current financial institutions, but remains largely unregulated. In the context of cryptocurrencies, we should distinguish between:

(1) e-banking and other electronic financial services offered by established banks and financial institutions;
(2) Central Bank digital currencies (tradeable against a hard currency);
(3) cryptocurrencies, some of which are built on distributed ledger technologies (DLTs), including Bitcoin and Ethereum, as well as some asset-referenced tokens or stablecoins, pegged to real-world currencies;
(4) tokens like Uniswap, which manage decentralised-finance (DeFi) protocols.

In addition, El Salvador passed its Bitcoin Law in June 2021 which recognized Bitcoin as legal tender for any transaction, giving Bitcoin equivalent legal status to the US dollar, El Salvador's official currency.

Why does it matter?

Cryptocurrencies have become a vehicle for speculation, being assets with a highly volatile value. The Economist suggests that major chains and a handful of Ethereum-based tokens (including stablecoins) accounted for about 90 per cent of cryptocurrency value, which it estimated at around some USD 820 billion at the end of November 2022. This estimated value has already fallen some 70 per cent below the peak a year ago, but is still relatively high compared with most of crypto's history.

Some electronic money firms offering digital banking services are not banks (e.g. Revolut) and do not offer the same customer protections or guarantees required from or offered by

authorized retail banks offering digital financial services. Customers do not always realize this and may only discover the lack of protection later, to their cost.

Their relative anonymity and the lack of effective regulatory oversight of cryptocurrencies to date have made them easy targets for money laundering and ransomware attacks by criminals, but cryptocurrencies have been praised for generating innovation and opportunity.

The cryptocurrency exchange FTX filed for bankruptcy in November 2022, owing its largest creditors almost USD 3.1 billion, with thousands more users waiting to get their money back. Following the collapse of FTX, Sir Jon Cunliffe, Deputy Governor for Financial Stability at the Bank of England, has called for better regulations of cryptocurrencies to protect the global financial system. He suggested that cryptocurrencies are currently not "large enough or interconnected enough with mainstream finance to threaten the stability of the financial system", but that their links with mainstream finance are developing rapidly. Two American Senators are not so sure, however, and have written to three financial regulators – the Federal Reserve, the Federal Deposit Insurance Corporation and the Office of the Comptroller of the Currency – asking them to assess the traditional banking system's exposure to crypto assets.

What are the regulatory options at hand?

Currently, nascent regulatory approaches build on a long and distinguished historical tradition of banking regulations. Regulations could extend these and potentially include: 1) defining asset classes; 2) authorization or licences to operate within a certain territory (which may be difficult to enforce in the online world); 3) minimum capital and liquidity requirements; 4) maximum exposure, gearing or leverage and risk limits; and 5) customer deposit or customer protection guarantees, including protection against fraud.

For example, in March 2022, Members of the European Parliament (MEPs) developed draft rules for the supervision, consumer protection, and environmental costs and sustainability of cryptocurrencies. MEPs want the European Securities and Markets Authority (ESMA) to supervise asset-referenced tokens, with the European Banking Authority (EBA) in charge of supervising electronic money tokens. The proposed EU Markets in Crypto-Assets Act divides crypto-assets into: non-fungible tokens (NFTs) or virtual gadgets; stablecoins, with value linked to a real-world asset; and digital currencies, with a fixed exchange rate against a hard currency.

In the United States, efforts are also underway in Congress to write legislation for the cryptocurrency industry. Senators Cynthia Lummis (R., Wyoming) and Kirsten Gillibrand (D., New York) outlined the draft Lummis-Gillibrand bill, *the Responsible Financial Innovation Act*, in June 2022 to create a "complete regulatory framework for digital assets" that seeks to balance the need for guardrails and consumer protections with innovation. The Stabenow-Boozman bill proposes giving the Commodity Futures Trading Commission (CFTC) direct oversight of tokens that qualify as 'digital commodities' (including Bitcoin and ether). Online exchanges and other services that facilitate trading of the tokens would be required to register with the CFTC.

The UK is set to approve laws in the Financial Services and Markets Bill, which is currently before Parliament. The bill will introduce regulation for stable coins – a crypto-asset backed by an asset such as a currency – and the marketing of crypto-assets.

However, extending existing regulatory approaches is difficult for new classes of assets, players or entrepreneurs in the relatively borderless environment of the online world. And should

regulation be *ex-ante* or *ex-post*? Should regulators focus on regulations in advance to limit or avoid problems, or on punitive actions afterwards, to punish abuse? It is noticeable that current charges against Samuel Bankman-Fried originate with financial regulators, the Securities and Exchange Commission (SEC) and the CFTC, rather than the Federal Communications Commission (FCC) or the Federal Trade Commission (FTC).

The regulation of crypto-currencies poses profound challenge to regulators because of their complex nature, their relative anonymity, and their widespread availability online across borders.

7.5   ICT regulatory sandboxing for innovation[138]

What is a regulatory sandbox and why does it matter?

The Consultative Group to Assist the Poor (CGAP), a partnership with the World Bank, defines a sandbox as "a framework set up by a regulator that allows fintech start-ups and other innovators to conduct live experiments in a controlled environment under a regulator's supervision".[139] In this experimental environment, new ICT/digital products, technologies, and business models can be tested under a set of rules, supervision requirements, and appropriate safeguards. Sandboxes were first used by financial regulators as closed environments where new 'fintech' was tested. Financial regulators at the time tested both compliance with regulation and in some jurisdictions, investigated if the regulations themselves needed to be updated.

The new, complex challenges ushered in by digital technological advances require innovative governance mechanisms to address them – sandboxes are one such mechanism that ICT regulators can apply. They can reduce regulatory uncertainty, help emerging innovators, build capacity with and cooperation between regulators, and increase regulatory clarity and compliance.

What are the options at hand?

Regulatory sandboxes are time-limited collaborative efforts, which involve not only the ICT regulators but other sector regulators, service providers and relevant stakeholders. A sandbox enhances collaboration between regulatory authorities and industry by increasing the role of the regulator to nurture and support innovation in sectors that are typically heavily regulated. This, however, is not without its demands or risks – regulatory sandboxes are resource intensive, can increase risk for the regulator (in terms of competition and collusion) and can be difficult to scale to meet the demand. These risks need to be constantly monitored and considered from conceptualization, operationalization, and finally at reporting and exiting the sandbox.

Before creating a sandbox the regulator should also consider alternatives and assess whether any of the existing regulatory tools could provide a solution. Consideration is needed as to whether a simple rule change would not enable the regulation for that market-ready solution… Is live testing indeed necessary for the regulator to learn what changes need to be made? Are safety conditions for end users satisfied? How to ensure that the sandbox will not create an unfair playing field?

---

[138] This brief is adapted from an upcoming ITU article on ICT Regulatory sandboxes developed by Ms. Thabisa Faye.
[139] CGAP (2018). Regulatory Sandboxes: What have we learnt so far? Consultive Group to Assist the Poor Blog.

Over the past four years, regulators have emphasized the importance of broadening the legal framework to allow for experimental regimes for innovation by providing a safe space for digital experimentation, as highlighted in the GSR Best Practice Guidelines.[140] A range of tools and techniques can be used to create a dynamic regulatory environment ranging from temporary licences to technology test beds and pilots to regulatory sandboxes in which digital market failures and opportunities have space and flexibility to address present and future challenges.

ICT regulators in Colombia, France, Mexico, Thailand, Saudi Arabia and more have set up regulatory sandboxes as an alternative regulatory tool to fine-tune new business models, fast-track market entry for small, non-traditional or new players, connect the unconnected, and assess resilience of future networks and services. Others are in the process of doing so. In the Dominican Republic, draft regulation is under consultation to promote innovation and enable regulatory testing granting authority to the regulator, INDOTEL, to establish regulatory sandboxes.[141]

7.6 How can regulation support the twin green and digital transitions?

What are the issues?

Digital technologies have an important role to play in addressing the world's most pressing climate concerns and can help speed up a much-needed transition to a circular, green economy.

At the same time, the ICT sector has a growing environmental footprint as its use of energy and raw materials increases. ITU research shows that the operational greenhouse gas (GHG) emissions of 150 of the world's leading tech companies, accounted for almost 1 per cent of the world total and consumed about 1.6 per cent of global electricity production in 2020.[142] Other studies suggest the ICT sector represents an estimated share of 2 to 4 per cent of total global GHG emissions.[143] There are also largely undocumented areas of environmental impact that are problematic – such as the depletion of metal and mineral resources and the exploitation of fossil resources.

Why does it matter?

Answering this question is complex – markets face different pressures of climate change, have different starting points in terms of reliance on fossil fuels, and different ambitions for national adaption. This creates complexity for global organizations, their compliance and risk-management systems and the products that they develop if operating across multiple regions.

Regulatory oversight on climate is challenged by the lack of a global framework for assessing the environmental impact of digital technologies. While data availability is a critical first step in helping companies move forward, there is no common agreement on what sustainability information companies should publish, or how this is measured. There is a growing need to improve environmental transparency and data accuracy on the ICT sector environmental

---

[140] See GSR Best Practice Guidelines 2019 on "Fast forward digital connectivity for all"; GSR Best Practice Guidelines 2020 on "The gold standard for digital regulation"; and GSR Best Practice Guidelines 2021 on "Regulatory uplift for financing digital infrastructure, access and use".

[141] INDOTEL y la UIT, presentan informe final sobre proceso de modernización regulatoria - INDOTEL

[142] https://www.itu.int/en/ITU-D/Environment/Pages/Toolbox/Greening-Digital-Companies.aspx

[143] https://www.berec.europa.eu/sites/default/files/files/document_register_store/2022/3/BoR_%2822%29_35_Draft_BEREC_Report_on_sustainability__FINAL.pdf

footprint in collaboration with other relevant bodies. National regulatory authorities (NRAs) for example could support the improvement of common indicators to measure the environmental impact of the digital sector.

What are the regulatory options at hand?

In the context of the Paris Agreement objective to limit global warming to well below 2°C and preferably to 1.5°C, more regulators and actors from the telecom industry are recognizing the importance of environmental issues. For example, the Body of European Regulators for Electronic Communications (BEREC) included sustainability in its 2021–2025 work strategy.[144] The European Commission identified digital technologies as a critical enabler to achieve net zero GHG emissions by 2050 in its Green Deal. Some NRAs, such as the French Regulator, ARCEP, are taking steps to address the environmental footprint of digital technologies, including hosting dedicated events, publishing research and gathering data on GHG emissions. In a 2021 report, ARCEP recommended the strengthening of public policy-maker capacity to steer the environmental footprint of digital technologies through data production. It also called for agreement on common standards and methodologies.[145] The recommendations were considered by the French Government who published a 'Digital and Environment' roadmap in 2021.[146]

Higher regulatory pressure to report climate data will motivate companies to voluntarily adopt widely recognized environmental standards and reporting. Such pressure will positively influence the relationship between digital transformation and green innovation of companies. Most companies have significant gaps in the data needed to assess their total climate impact – especially Scope 3 emission data from operations of suppliers. The information that does exist is siloed in different functions, preventing companies from developing a complete quantitative picture.

NRAs can support public bodies efforts to increase data available to evaluate the environmental sustainability of digital infrastructure/technologies and support harmonizing standards and methodologies. Moreover NRAs, with environmental agencies, can contribute at regional or national level to build awareness amongst consumers and operators, develop codes of conduct with stakeholders, and encourage research on ICT sustainability. For example, BEREC recognizes that making environmental information available to consumers is a potentially effective tool to create positive incentives for providers and steer the market in the right direction.[147, 148]Improved data accuracy and a common methodology can help build a comprehensive view of the ICT sector environmental footprint, whilst providing regulators with more detailed and reliable information to support their decision-making.

---

[144] https://www.berec.europa.eu/sites/default/files/files/document_register_store/2022/3/BoR%20%2822%29%2034_External%20Sustainability%20Study%20on%20Environmental%20impact%20of%20EC.pdf
[145] https://en.arcep.fr/uploads/tx_gspublication/achieving-digital-sustainability-report-dec2020.pdf
[146] https://www.ecologie.gouv.fr/feuille-route-numerique-et-environnement
[147] https://www.berec.europa.eu/sites/default/files/files/document_register_store/2022/3/BoR_%2822%29_35_Draft_BEREC_Report_on_sustainability__FINAL.pdf
[148] https://www.berec.europa.eu/sites/default/files/files/document_register_store/2022/3/BoR%20%2822%29%2034_External%20Sustainability%20Study%20on%20Environmental%20impact%20of%20EC.pdf

7.7   e-Waste – a regulatory outlook

Digitalization is a top priority for most Governments. The green transition is too. Combining these, some are coining the term "twin green and digital transition". The idea is that these two important transitions reinforce each other. For example, blockchain technology that is already used in cryptocurrencies, can be used in material tracing to support the transition to a circular economy by making it possible for information on product maintenance and recycling to be accessible and follow a product through its life[149].

Both digital and green are not waste-neutral. The two transitions require electricity use, and oftentimes the energy required is still sourced from fossil fuels. Both continue to contribute to the generation of e-waste, too. Electrical and electronic equipment includes a wide range of products with circuitry or electrical components with a power or battery supply. This equipment becomes e-waste once it has been discarded by its owner as waste without the intent of reuse. Each product has different material content, is disposed of and recycled in different ways and is unequally harmful to the environment and human health if not managed in an environmentally-sound manner. Latest figures estimate that the world generates over 50 million tonnes of e-waste per year[150].

The digital, renewable energy and electric vehicles industries, medical and military are all competing for the same critical materials to power products and services. To produce the batteries, the chips and the hard drives, for example, industries are taking advantage of the unique and lightweight characteristics of rare earth elements. Elements such as yttrium, europium and neodymium are key components of modern electronics. Rare earths are also of strategic and political importance as although they exist in abundance, they are not found in solid chunks but unevenly distributed across the earth's crust, making them extremely expensive and polluting to extract. One source pinpoints the limitations of the current industry approach, estimating that global rare earth production could be sustained at its current pace for only one hundred years[151].

Three words can define digital in the context of the materials that power it –

- **Reliance** on critical materials,
- **Fragility** of material pricing effects and supply chain risk on the production side, and
- **Competition** for materials with other politically strategic sectors.

Latest data show that the whereabouts of roughly 20 per cent of the e-waste generated globally is unknown. It is assumed that the other 80 per cent is dumped, burned, leached, landfilled, stored in cupboard drawers or incorporated into second-hand and counterfeit devices.

Only 40 per cent of countries have a national policy, legislation or regulation controlling the management of e-waste[152], with very few of these are legally binding or even in the implementation phase. A strong national framework where ICT regulation meets environmental management regulation is imperative in order to lay out the legal obligations which will help boost e-waste

---

[149]   Digital Solutions for a Circular Electronics Value Chain: https://www.itu.int/en/ITU-D/Environment/Documents/Publications/2021/Thought%20Paper%202021.pdf

[150]   The Global E-waste Monitor 2020: https://www.itu.int/en/ITU-D/Environment/Pages/Toolbox/Global-Ewaste-Monitors.aspx

[151]   Global Potential of Rare Earth Resources and Rare Earth Demand from Clean Technologies: https://www.mdpi.com/2075-163X/7/11/203

[152]   Ibid: https://www.itu.int/en/ITU-D/Environment/Pages/Toolbox/Global-Ewaste-Monitors.aspx

collection and recycling and hold certain actors in the electronics sector accountable for the environmental impact of their businesses. Government ministries and agencies (including for ICTs and the environment) and regulators need to work together to improve e-waste compliance frameworks and practices.

Unlike coal, oil and gas, precious resources can be reused multiple times. Boosting e-waste management options will ultimately ensure the return of precious resources back into production whilst setting a level playing field through e-waste regulation, thus lowering entry costs and the extraction costs during recycling through greater economies of scale.

Governments, businesses and consumers need to look at the precious resources at play today, assessing over a century's worth of environmental impact from our global dependence on coal, oil and gas as we struggle to limit global warming to below 1.5 degrees, compared to pre-industrial levels. These resources play a critical role in the digitalization of every country and are needed to enable inclusive and sustainable digital transformation. National decision-makers and regulators must act to make digital 'responsible' and fit for the future. In addition to licensing, enforcement, consumer protection, quality of service, spectrum management and managing competition, ICT regulators must define and actively play a role e-waste management to protect the environment and human health while reduce economic, social and development risks in the long run.

7.8   Early warning systems

What are the issues?

As the world is failing to achieve the global climate commitments, the risk of natural hazards is increasing. Early warning systems (EWS) are a proven, effective, and feasible climate adaptation measure that saves lives and provides at least a tenfold return on investment. In March 2022, the UN Secretary-General set up the UN Early Warning Initiative that stipulates that by 2027, every person in the world should be covered by an early warning system. With the newly defined Executive Action Plan, ITU took the lead on the 'Warning Dissemination and Communication' pillar, which is a critical component of early warning systems – this ensures that an alert about an identified risk will reach, and can be understood by, those people at risk. To this end, ITU highlights the opportunities of growing digital networks and services to reach more people, using multiple communication channels, including radio, TV, sirens, Internet, social media, mobile networks, etc.

Why does it matter?

Today, digital growth presents new opportunities and solutions that reach billions of people more quickly and more effectively before, during and after disasters. With 95 per cent of the global population covered by mobile broadband networks and three out of four people owning a mobile phone, mobile networks and services are becoming an increasingly important communication channel to alert populations about an imminent hazard. Using cell-broadcast and/or location-based SMS, warnings can be targeted to reach only those located in an *at-risk* area. The geo-located warning can also be adapted to specific user requirements, such as a user's language. Cell-broadcast and/or location-based SMS are proven technologies already used by almost all developed countries in the world – but only by very few developing countries however.

What are the regulatory options at hand?

Early warning systems have been largely unregulated in most parts of the world. In 2018, the EU passed a new law stipulating that by 2022, all EU Member States have to set up early warning systems that sends alerts via mobile networks.[153] This regulatory approach has sped up the adoption process and proven an effective way of accelerating the uptake of public warning systems across the EU Member States. As of December 2022, all European countries had adopted a public warning system based on mobile-cellular networks or were in the selection process to develop the system.

It should also be noted that other countries have used the regulatory approach adopted by the EU. In Peru[154] for instance, the 2016 public warning systems regulation aims at "guiding the population, […] before, during and after the occurrence of a disaster or an emergency situation, using […] public telecommunications networks and services". While the regulatory approach may not be the only way, it has proven efficient in ensuring countries adopt a public warning system. A clear regulatory framework, appropriate incentives and financial alignment to funding programmes can accelerate drastically the roll-out of early warning systems, at a reasonable cost, and with massive impact on public safety.

A mobile network-based EWS will depend on the engagement of mobile network operators. As private companies in general, they need to understand the financial implications to ensure their business continuity, and to understand the value of their assistance they provide in saving lives.

7.9 Regulating the use of earth orbits by objects to ensure sustainable transmissions from satellites

What are the issues?

Space debris and the number of objects orbiting the Earth has increased exponentially over the past few years.

This increased traffic volume creates difficulties across various aspects of space activities: 1) traffic management in the process of transiting to an orbital location; 2) the risk of 'Kessler Syndrome' with too many objects to avoid collision; 3) interference affecting astronomical observation from earth locations; and 4) the risk of signal interference if satellites are unable to orbit within initially planned trajectories.

Why does it matter?

A number of factors come into play in this context. In space, maintenance, access to objects and changes of plan are challenging because of the remote location and hostile environment. Currently, there is an unprecedented increase in constellation projects and in the variety of size of satellites orbiting Earth on very low, low and medium altitudes. Space is a crucial actor in the

---

[153] European Electronic Communications Code (EECC) EECC Article 110 requires that "By 21 June 2022, Member States shall ensure that, when public warning systems regarding imminent or developing major emergencies and disasters are in place, public warnings are transmitted by providers of mobile number-based interpersonal communications services to the end-users concerned."

[154] LAW N°30472 on the Creation of SISMATE, and Decreto Supremo n°019-2016-MTC about the creation of SISMATE project ("Sistema de Mensajeria de Alerta Temprana de Emergencias", translated in "Emergency Early Warning Messaging System").

Earth's economies – many activities depend on space, like geo-localization, climate monitoring, emergency response, broadband access in remote territories and astronomy. Space endeavours remain glamorous and attractive to entrepreneurs who may not fully understand the constraints of space sustainability. Underlying all of the above, a regulatory framework for managing and removing debris does not exist.

What are the options at hand?

Debris has been a source of concern in the realm of space activity for decades. Some best practice, studies, standards and rules have been developed. From an ITU point of view, the Radio Regulations manage the spectrum and its use from an orbital location and prevent harmful signal interference.

ITU issued Recommendation ITU-R S.1003.2 (12/2010) on environmental protection of the geostationary-satellite orbit (GSO), and more specifically on the GSO graveyard and limiting debris in general. It is a non-binding recommendation and is the only ITU text related directly to debris. The United Nations Office for Outer Space Affairs (UNOOSA) maintain a register of space objects within limits – it involves non-mandatory registration.

Researchers are collecting data on active orbiting objects and debris up to a certain size. Trajectory calculations and AI help non-GSO constellations avoid collision. Space Agencies are studying the subject and are organizing their work through the Inter-Agency Space Debris Organisation Committee (IADC). The Artemis Accords, a series of non-binding multilateral agreements between the US Government and other world governments, have been signed by more than 20 countries.

The United Nations has adopted a Resolution against anti-satellite weapons (ASAT) and ratified by countries. Some countries, such as France with its Space Operation Act, are evolving their legislation to limit the impact of satellite constellations and objects in space.

Actors in the realm of space are asking the international community for strong and binding rules to limit the deployment of satellite constellations. The new operators are aware of risks and are sensitive to their reputation and responsibility (for example oneweb, spaceX, Kuipers) but individual actions are insufficient in the face of the volume of constellations.

Soft law and sharing practices and standards will not be enough to ensure sustainable space activity. At the same time, the development of formal regulation will be costly and will take time, even though it is needed sooner rather than later.

8   Looking ahead: everyone can be a winner

Connectivity has transformed societies, economies and governance systems, shifting priorities for policy-makers and regulators, markets and users. It will underpin every development path from this point forward.

Digital transformation is a once-in-a-generation opportunity to leverage digital technologies and Internet access as an equalizer of global development, providing every country and individual with access to new economic and social opportunities. The current state of digital markets – at the national and, importantly, global level – has not connected everyone everywhere, and new policy and governance approaches are needed to make the digital economy more inclusive.

New lean patterns of digital policy and regulation will provide a canvas for problem-solving in the context of digital transformation, powering virtuous cycles across ecosystems. Equipping national decision-makers with a new generation of data-informed tools will allow them to find their own path to fast-tracking the achievement of social, economic and environmental goals towards the Future We Want for all.

Annex 1: G5 Benchmark methodology

List of indicators and components, including scoring logic and data sources

Pillar I: National collaborative governance Component: Regulatory collaboration in digital core areas			
Indicators	Option	Score	Source
Collaboration with (Independent) Spectrum Authority	Yes, formal collaboration (MOU or joint program or committee)	2	TREG and desk-top research
	Yes, informal or semi-formal collaboration	1	
	No collaboration, no entity in charge, or no data	0	
	ICT regulator has the mandate / same authority	2	
	Activities carried out under the same ministry	1	
Collaboration with (Independent) Broadcasting (content) Authority	Yes, formal collaboration (MOU or joint program or committee)	2	TREG and desk-top research
	Yes, informal or semi-formal collaboration	1	
	No collaboration, no entity in charge, or no data	0	
	ICT regulator has the mandate / same authority	2	
	Activities carried out under the same ministry	1	
Collaboration with Cybersecurity agency	Yes, formal collaboration (MOU or joint program or committee)	2	TREG and desk-top research
	Yes, informal or semi-formal collaboration	1	
	No collaboration, no entity in charge, or no data	0	
	ICT regulator has the mandate / same authority	2	
	Activities carried out under the same ministry	1	
Collaboration with CERT	Yes, formal collaboration (MOU or joint program or committee)	2	TREG and desk-top research
	Yes, informal or semi-formal collaboration	1	
	No collaboration, no entity in charge, or no data	0	
	ICT regulator has the mandate / same authority	2	
	Activities carried out under the same ministry	1	TREG and desk-top research
Collaboration with (Independent) Data Protection Authority	Yes, formal collaboration (MOU or joint program or committee)	2	
	Yes, informal or semi-formal collaboration	1	
	No collaboration, no entity in charge, or no data	0	
	ICT regulator has the mandate / same authority	1	

(continued)

Pillar I: National collaborative governance Component: Regulatory collaboration in digital core areas			
Indicators	Option	Score	Source
	Activities carried out under the same ministry	1	
Collaboration between ICT ministry OR ICT regulator AND Digital (Transformation)Agency/ National Agency in charge of (coordination of) the implementation of digital policies/ strategies	Yes, formal collaboration (MOU or joint program or committee)	2	TREG and desktop research
	Yes, informal or semi-formal collaboration	1	
	No collaboration, no entity in charge, or no data	0	
	ICT regulator has the mandate / same authority	2	
	Activities carried out under the same ministry	1	

Pillar I: National collaborative governance Component: Cross-sector institutional cooperation			
Indicators	Option	Score	Source
Collaboration between ICT policy body (e.g., telecom/ICT/communication Ministry) and (Independent) Finance Regulator	Yes, formal collaboration (MOU or joint program or committee)	2	TREG and desktop research
	Yes, informal or semi-formal collaboration	1	
	No collaboration, no entity in charge, or no data	0	
	ICT regulator has the mandate / same authority	0	
	Activities carried out under the same ministry	0	
Collaboration between ICT policy body (e.g., telecom/ICT/communication Ministry) and Energy regulatory Authority	Yes, formal collaboration (MOU or joint program or committee)	2	TREG and desktop research
	Yes, informal or semi-formal collaboration	1	
	No collaboration, no entity in charge, or no data	0	
	ICT regulator has the mandate / same authority	2	
	Activities carried out under the same ministry	1	

(continued)

Pillar I: National collaborative governance Component: Cross-sector institutional cooperation			
Indicators	Option	Score	Source
Collaboration between ICT policy body (e.g., telecom/ICT/communica-tion Ministry) and Transport regulatory Authority	Yes, formal collaboration (MOU or joint program or committee)	2	TREG and desk-top research
	Yes, informal or semi-formal collaboration	1	
	No collaboration, no entity in charge, or no data	0	
	ICT regulator has the mandate / same authority	2	
	Activities carried out under the same ministry	1	
Collaboration between ICT policy body (e.g., telecom/ICT/communication Ministry) and (Independent) Competition Authorities	Yes, formal collaboration (MOU or joint program or committee)	2	TREG and desk-top research
	Yes, informal or semi-formal collaboration	1	
	No collaboration, no entity in charge, or no data	0	
	ICT regulator has the mandate / same authority	1	
	Activities carried out under the same ministry	1	
Collaboration between ICT policy body (e.g., telecom/ICT/communication Ministry) and Postal regulation Authority	Yes, formal collaboration (MoU or joint program or committee)	2	TREG and desk-top research
	Yes, informal or semi-formal collaboration	1	
	No collaboration, no entity in charge, or no data	0	
	ICT regulator has the mandate / same authority	2	
	Activities carried out under the same ministry	1	
Collaboration between ICT policy body (e.g., telecom/ICT/communication Ministry) and (Independent) Consumer Protection Authority, Data Protection Authority	Yes, formal collaboration (MOU or joint program or committee)	2	TREG and desk-top research
	Yes, informal or semi-formal collaboration	1	
	No collaboration, no entity in charge, or no data	0	
	ICT regulator has the mandate / same authority	1	
	Activities carried out under the same ministry	1	

(continued)

Pillar I: National collaborative governance Component: Cross-sector institutional cooperation			
Indicators	Option	Score	Source
Collaboration between ICT policy body (e.g., telecom/ICT/communication Ministry) and Ministry responsible for Health (e-health)	Yes, formal collaboration (MOU or joint program or committee)	2	TREG and desk-top research
	Yes, informal or semi-formal collaboration	1	
	No collaboration, no entity in charge, or no data	0	
	ICT regulator has the mandate / same authority	1	
	Activities carried out under the same ministry	1	
Collaboration between ICT policy body (e.g., telecom/ICT/communication Ministry) and Ministry responsible for Education (e-education)	Yes, formal collaboration (MOU or joint program or committee)	2	TREG and desk-top research
	Yes, informal or semi-formal collaboration	1	
	No collaboration, no entity in charge, or no data	0	
	ICT regulator has the mandate / same authority	2	
	Activities carried out under the same ministry	1	
Collaboration between ICT policy body (e.g., telecom/ICT/communication Ministry) and Ministry responsible for the Environment (e-waste)	Yes, formal collaboration (MOU or joint program or committee)	2	TREG and desk-top research
	Yes, informal or semi-formal collaboration	1	
	No collaboration, no entity in charge, or no data	0	
	ICT regulator has the mandate / same authority	2	
	Activities carried out under the same ministry	1	
Collaboration between ICT policy body (e.g., telecom/ICT/communication Ministry) and Ministry responsible for Economic development OR similar focusing on a single or a subset of economic sector/s, e.g., Industry, Agriculture, Fishery)	Yes, formal collaboration (MOU or joint program or committee)	2	TREG and desk-top research
	Yes, informal or semi-formal collaboration	1	
	No collaboration, no entity in charge, or no data	0	
	ICT regulator has the mandate / same authority	2	
	Activities carried out under the same ministry	1	

Pillar II: Policy design principles Component: Regulatory design procedures				
Indicators		**Option**	**Score**	**Source**
Are public consultations designed as a tool to gather feedback from national stakeholders and guide regulatory decision-making (e.g., clear deadlines, process are defined, requirement to respond to stakeholder comments is in place)?		Yes	2	TREG and desk-top research
		Yes, but there is no requirement/it is unclear what the timeline and process is and whether the regulator incorporates results in their decision-making/ there is no obligation to consider/respond to all comments	1	
		Not undertaken or required by law/No data	0	
Is there a formal requirement for Regulatory Impact Assessment (RIA) before regulatory decisions are made?		Yes	2	World Bank
		Yes, but not consistently applied to all decisions	1	
		No	0	
Are the decisions of the regulatory authority (entity in charge of regulation) subject to a general administrative procedures law?		Yes	2	TREG and desk-top research
		No	0	
Can affected parties request reconsideration or appeal adopted regulations to the relevant administrative agency (all sectors)?		Yes, administrative review by an independent body / the judiciary	2	World Bank
		Yes, administrative review by the regulatory body	1	
		No	0	
Are national policy and regulatory frameworks technology and service-neutral?		Yes, for both authorization/operating licences and spectrum	2	TREG
		Yes, for authorization/operating licences or spectrum, but not for both / There are exceptions to which bands of the spectrum are technology neutral	1	
		No	0	
Regulatory experimentation	Are there mechanisms for experimentation in ICT/digital regulation?	Yes	2	TREG and desk-top research
		No	0	
	Are there regulatory sandboxes for digital financial services?	Yes	2	CGAP
		No	0	
Policy reviews	Do ministries/regulatory agencies conduct ex-post policy reviews?	Yes	2	World Bank
		No	0	
	Do ministries/regulatory agencies conduct policy rolling reviews and commission monitoring reports?	Yes	2	World Bank
		No	0	

(continued)

Pillar II: Policy design principles Component: Regulatory design procedures			
Indicators	Option	Score	Source
Are the laws (all sectors) that are currently in effect available on a single website managed by the government?	Yes	2	World Bank
	No	0	
Is public access to information ensured and fundamental freedoms protected, in accordance with national legislation and international agreements?	Yes	2	United Nations
	No	0	
Are there ethics rules in place that apply to the regulator's staff, including Head/Chairperson and Members/Commissioners of NRA (e.g., improper acceptance of gifts, personal and financial conflicts of interest, post-employment obligations)?	Yes	2	TREG
	No	0	

Pilar III: Digital Development Toolbox Component: Digital strategy for development				
Indicators		Option	Score	Source
Strategy design and implementation	Is there an overarching digital strategy in place?	Yes	2	TREG and desktop research
		Expired, or being planned, is part of a broader development strategy, only covers specific plans or not clearly implemented	1	
		No	0	
	The digital strategy has mechanisms for implementation/operational objectives?	Yes	2	TREG and desktop research
		Yes, partially, or the strategy has expired	1	
		No/ No strategy	0	
Is broadband considered as part of universal access/service definition?		Yes	2	TREG and desktop research
		No	0	
Is there a digital identity framework in place?		Yes	2	TREG and desktop research
		No	0	
Is there an e-gov/ Digital first government/ National e-government strategy or equivalent?		Very high development	2	United Nations
		High development	1	
		Medium development	0	
		Low development	0	

(continued)

Pilar III: Digital Development Toolbox Component: Digital strategy for development			
Indicators		**Option**	**Score**	**Source**
Has your country adopted e-waste regulations or e-waste management standards?		Yes	2	Global E-waste Statistics Partnership (GESP)
		No	0	
Does a regulatory framework exist for ICT accessibility for persons with disabilities?		Yes	2	TREG
		No clear framework/ enforcement or partial	1	
		No	0	
Is there a legislation/regulation for child online protection?		Yes	2	TREG
		No	0	
Public services	Has your country adopted any policy/legislation/regulation related to Smart Cities?	Yes	2	TREG and desktop research
		No	0	
	Has your country adopted any policy/legislation/regulation related to e-Health or Smart Health?	Yes	2	TREG and desktop research 2021
		No	0	
	Has your country adopted any policy/legislation/regulation related to e-applications and/or m-applications on Education and Learning?	Yes	2	TREG and desktop research
		No	0	
Cybersecurity	Is there cybersecurity legislation or regulation?	Yes	2	TREG, GCI, UNCTAD and desktop research
		Partial coverage	1	
		No	0	
	Has your country signed or ratified the Budapest convention on cybersecurity?		2	Council of Europe
			0	
Data protection	Are there formal data protection rules (e.g., law, regulations)?	There is a law and a data protection agency has been established	2	TREG, UNCTAD and desktop research
		There is a law but either: i) a data protection agency has not yet been established, ii) the law is not yet implemented, or iii) the law covers only a limited number of activities	1	
		No	0	

(continued)

Pilar III: Digital Development Toolbox Component: Digital strategy for development			
Indicators	Option	Score	Source
Has your country signed on international agreements determining jurisdiction and/or managing cross border flows on data privacy?	Yes, determining jurisdiction and managing cross border flows	2	Desktop research
	Yes, either determining jurisdiction or managing cross border flows	1	
	No	0	
Emergency tele-communications	Has your country signed or ratified the Tampere convention for communications in emergency situations?	Yes	2	UNTC
		No	0	
Does a National Emergency (Telecommunications) Plan exist?	Yes	2	TREG and desktop research
	No	0	
Infrastructure sharing	Does an official register or a mapping exist in your country of all telecommunication/ICT infrastructure?	Yes	2	TREG and desktop research
	Yes, but only for some infrastructure or evidence is unclear	1	
	No	0	
Is there any cross-sector (ICT, energy, rail or other) infrastructure sharing or fibre co-deployment regulations/agreements/promotion initiatives in your country?	Yes	2	Desktop research
	No	0	

Pilar III: Digital Development Toolbox Component: SDGs			
Indicators	Option	Score	Source
Is the digital strategy explicitly SDG-oriented OR has mention of specific SDGs or other international development goals (e.g., MDGs, WSIS goals, EU Strategic objectives)?	Yes	2	UNSTAT
	No	0	
Are there policy instruments aimed at supporting the shift to sustainable consumption and production, or coordination mechanism for sustainable consumption and production?	Yes	2	UNSTAT
	No	0	

(continued)

Pilar III: Digital Development Toolbox Component: SDGs				
Indicators		Option	Score	Source
Is there a developed and operationalized global strategy for youth employment and to implement the Global Jobs Pact of the ILO?		Yes	2	Desktop research
		Developed, not yet operationalized	1	
		No	0	
Strategies for targeted groups	Broadband plan/ initiative includes promotion of the provision of broadband services to women and girls	Yes	2	TREG and desktop research
		No	0	
	Broadband plan/ initiative includes promotion of the provision of broadband services to persons with disabilities	Yes	2	TREG and desktop research
		No	0	
	Broadband plan/ initiative includes promotion of the provision of broadband services to young people	Yes	2	TREG and desktop research
		No	0	

Component: International collaboration and harmonization			
Indicators	Option	Score	Source
Does your country belong to regional integration initiatives with ICT chapters?	Yes	2	Desktop research
	Yes, partial	1	
	No	0	
Has your country have made commitment to facilitate trade in telecommunication services?	Yes	2	WTO
	No	0	

Component: Framework for innovation			
Indicators	Option	Score	Source
Is there a holistic innovation policy or one tailored to the ICT/digital sector?	Yes	2	Desktop research
	Planned or not clearly implemented	1	
	No	0	

(continued)

Component: Framework for innovation			
Indicators	Option	Score	Source
Is there a forward-looking competition policy, law or regulation applied to digital markets?	Yes	2	TREG and desk-top research
	Planned, or only a general competition law exists	1	
	No	0	

Pillar IV: Digital economy policy agenda Component: Framework for digital transformation				
Indicators		Option	Score	Source
Has your country adopted a forward-looking or innovative national strategy, policy or initiative focusing on spectrum (e.g., IMT-2000, 5G, FWA)		Yes	2	TREG and desk-top research
		No	0	
Are there policies and regulations for e-commerce/e-transactions?		Yes	2	TREG20, UNCTAD, and desktop research
		Rules at regional level exist (e.g., EU) but has not yet formulated national rules to match or no monitoring and enforcement of rules or has limited provisions	1	
		No	0	
Digital Skills	Does universal service/ access definition includes connectivity for telecentres or schools (primary, secondary, post-secondary)?	Yes	2	TREG
		No	0	
	Has the Universal Service Fund financed projects for connecting schools (primary, secondary, post-secondary, universities, specialized training institutions, etc.) or multi-purpose telecentres?	Yes	2	TREG
		No	0	
	Does the digital strategy include the educational sector?	Yes	2	TREG
		No	0	
Policies for specific sectors	Does the digital strategy include specific mentions of multiple sectors of the economy?	Yes	2	Desktop research
		Partly/ Not clearly expounded	1	
		No	0	

(continued)

Pillar IV: Digital economy policy agenda Component: Framework for digital transformation				
Indicators		**Option**	**Score**	**Source**
	Has your country adopted any policy/legislation/regulation related to cloud or edge computing?	Yes, for Agriculture/Science/Financial Services	2	TREG and desk-top research
		Yes, for two of Agriculture/Science/Financial Services	1.3	
		Yes, for only one of Agriculture/Science/Financial Services	0.7	
		No	0	
Industry 4.0	Does it include a strategy, policy or initiative focusing on the Internet of Things (IoT)? Or have any measure/s been applied regarding spectrum management and availability for IoT?	Yes	2	TREG and Desktop research
		No	0	
	Has your country adopted a generic policy/legislation/regulation related to cloud computing?	Yes	2	TREG and desk-top research
		No	0	
	Has your country adopted a national strategy, policy or initiative related to Artificial Intelligence?	Yes	2	TREG and desk-top research
		No	0	

Component: Taxation framework				
Indicators	**Option**	**Score**	**Source**	
Are there specific taxes on the telecom/digital sector (supply side) OR on Internet services/devices/SIM cards/airtime recharge (demand side)?	Yes	0	ITU Tariff Policies and desktop research	
	No	2		
Are there regulatory incentives targeted at network operators or other digital market players?	Yes, for all	2	TREG0 and desk-top research	
	Yes, but only for some	1		
	No	0		

Component: Codes of conduct				
Indicators	**Option**	**Score**	**Source**	
Do codes of conduct exist (voluntary or enforceable/required by regulator)?	Yes	2	Desktop research	
	No	0		

Fulfilment of G5 Benchmark thresholds (by pillar) corresponding to the level of readiness for digital transformation

Readiness level	Pillar I: National collaborative governance	Pillar II: Policy design principles	Pillar III: Digital development toolbox	Pillar IV: Digital economy policy agenda	Maximum score	Minimum score
Limited	• No collaboration • No entity in charge	• Public consultations are not undertaken or required by law • No formal requirement for a regulatory impact assessment • The decisions of the regulatory authority are not subject to a general administrative procedures law • Affected parties may not request reconsideration or appeal of regulations adopted by the administrative agency • Authorization/operating licences or spectrum, are not technology and service neutral • No mechanisms for regulatory experimentation or sandboxes exist • No ex-post regulatory policy reviews	• No overarching digital strategy in place • No digital identity framework • No e-government strategy in place • No existence of policy/legislation/regulation for smart cities, e-health, and applications for education and learning • No cybersecurity/cybercrime legislation and/or regulation in existence • There is neither a data protection law nor a data protection agency • No national emergency telecommunications plan	• No holistic innovation strategy tailored to the ICT sector • No forward-looking competition policy, law or regulation applied to digital markets • No policies and regulations for e-commerce transactions in place • No strategy, policy or initiative focusing on IoT • Taxes on the telecommunication and digital sector exist	30	0

(continued)

Readiness level	Pillar I: National collaborative governance	Pillar II: Policy design principles	Pillar III: Digital development toolbox	Pillar IV: Digital economy policy agenda	Maximum score	Minimum score
Transitioning	• Activities carried under the same ministry • Informal collaboration	• Public consultations exist but there is no requirement/it is unclear what the timeline and process is and whether the regulator incorporates results in their decision-making/there is no obligation to consider/respond to all comments • Regulatory Impact Assessment is required but it is not consistently applied to all decisions • There is an administrative review by the regulatory body • Authorization/operating licences or spectrum, are either technology or service neutral (with exceptions)	• Overarching digital strategy expired, or being planned, is part of a broader development strategy, only covering specific plans or not clearly implemented • Partial measures regarding cybersecurity and cybercrime regulation • Data protection law exists but a data protection agency has not been established	• Forward looking competition policy, law or regulation applied to digital markets, or spectrum management processes in the process of definition • Rules at regional level exist but country has not yet formulated national rules to match them, or no monitoring and enforcement of rules exist or, if they do, they have limited provisions	60	30

(continued)

Readiness level	Pillar I: National collaborative governance	Pillar II: Policy design principles	Pillar III: Digital development toolbox	Pillar IV: Digital economy policy agenda	Maximum score	Minimum score
Advanced	Formal collaboration (Joint Program of Committee)	• Public consultations designed as a tool to gather feedback from national stakeholders and guide most regulatory decision-making • Regulatory Impact Assessment is required for some decisions • The decisions of the regulatory authority are subject to a general administrative procedures law • Affected parties may request reconsideration or appeal of regulations adopted by the administrative agency to the judiciary • Authorization, operating licences, and spectrum are technology and service neutral • Frequent ex-post policy reviews • Laws that are currently in effect available on multiple websites managed by the government	• Existing of current digital strategy in place • Digital identity framework in place • Existence of a national e-government strategy or equivalent • Existence of policy/legislation/regulation for some areas of digital economy • Full cybersecurity and cyber-crime legislation and regulatory framework • Existence of a law and data protection agency • Existence of a National Emergency Telecommunications Plan • Mention of SDG or other international development goals mentioned in the digital strategy	• Holistic but general innovation strategy • Competition policy, law or regulation applied to digital markets or spectrum management processes • Regulations for e-commerce transactions in place • Strategy, and initiative focusing on IoT • Selective tax exemptions for the tele-communications and digital sectors	80	60

90

(continued)

Readiness level	Pillar I: National collaborative governance	Pillar II: Policy design principles	Pillar III: Digital development toolbox	Pillar IV: Digital economy policy agenda	Maximum score	Minimum score
Leading	• Formal collaboration (Joint Program of Committee) with regular meetings and high level participation	• Public consultations designed as a tool to gather feedback from national stakeholders and guide all regulatory decision-making • Regulatory Impact Assessment is required for all major decisions • The decisions of the regulatory authority are subject to a general administrative procedures law • Affected parties may request reconsideration or appeal of regulations adopted by the administrative agency to an independent body or the judiciary • Authorization, operating licences, and spectrum are technology and service neutral • Mechanisms for regulatory experimentation or sandboxes exist • Systematic ex-post policy reviews • Laws that are currently in effect available on a single website managed by the government	• Existing of current and updated digital strategy in place • Digital identity framework in place • Existence of a national e-government strategy or equivalent • Existence of policy/legislation/regulation for Smart Cities, e-Health, and applications for education and learning • Full cybersecurity and cyber-crime legislation and regulatory framework • Existence of a law and data protection agency • Existence of a National Emergency Telecommunications Plan • Mention of SDG or other international development goals mentioned in the digital strategy	• Holistic innovation strategy tailored to the ICT sector • Forward looking competition policy, law or regulation applied to digital markets or spectrum management processes • Policies and regulations for e-commerce transactions in place • Strategy, policy, or initiative focusing on IoT • Overarching tax exemptions for the tele-communications and digital sectors	100	80

Note: The Table depicts likely scenarios to illustrate the various stages. Country circumstances may differ from the outline provided above.

Source: ITU

For more information on the G5 Benchmark, check ITU, Benchmark of fifth-generation collaborative digital regulation – expert report, March 2022

Annex 2: Unified framework – List of indicators (119)

Benchmark/ Indicator nb*	Benchmark/ Indicator name
1	**National digital policy agenda (15 individual indicators)**
T36	National plan that involves broadband
BIII01a	Is there an overarching digital strategy in place?
BIII13	Is the digital strategy SDG-oriented OR has mention of SDGs or other international development goals (e.g., MDGs, WSIS goals, EU Strategic objectives)?
BIV08a	Does the digital strategy include multiple sectors of the economy?
BIII14	Are there policy instruments aimed at supporting the shift to sustainable consumption and production, or coordination mechanism for sustainable consumption and production?
BIII15	Is there a developed and operationalized global strategy for youth employ-ment and to implement the Global Jobs Pact of the ILO?
BIII01b	The digital strategy has mechanisms for implementation/ operational objectives?
BIII02	Is broadband considered as part of UAS definition?
BIII16a	Broadband plan / initiative includes to promote the provision of broadband services to women and girls
BIII16b	Broadband plan / initiative includes to promote the provision of broadband services to persons with disabilities?
BIII16c	Broadband plan / initiative includes to promote the provision of broadband services to youth people
BIV03	Is there a holistic innovation policy or one tailored to the ICT/digital sector?
BIV07a	Does universal service/access definition includes connectivity for Telecentres or Schools (primary, secondary post-secondary)?
BIV07b	Has the Fund financed projects for connecting schools (primary, secondary, post-secondary, universities, specialized training, institutions, etc.) or Multi-purpose telecenters?
BIV07c	Does the digital strategy include the educational sector?
2	**Regulatory capacity (17 individual indicators)**
T1	Separate telecom/ICT regulator
T2	Autonomy in decision making
T3	Accountability
T4	Percentage of diversified funding
T6	Enforcement power
T7	Sanctions or penalties imposed by regulator
T11	Traditional mandate: entity in charge of quality of service obligations measures and service quality monitoring
T12	Traditional mandate: entity in charge of licensing

(continued)

Benchmark/ Indicator nb*	Benchmark/ Indicator name
T13	Traditional mandate: entity in charge of interconnection rates and price regulation
T14	Spectrum: Entity in charge of radio frequency allocation and assignment
T15	Entity in charge of Spectrum Monitoring and Enforcement
T16	Entity in charge of universal service/access
T17	New mandate: entity in charge of broadcasting (radio and TV transmission)
T18	New mandate: entity in charge of broadcasting content
T19	New mandate: entity in charge of Internet content
T20	New mandate: entity in charge of IT
T21	Consumer issues: entity responsible for comparative tariff information, consumer education and handling consumer complaints
3	**Good governance (11 individual indicators)**
BII02	Is there a formal requirement for Regulatory Impact Assessment (RIA) before regulatory decisions are made?
BII03	Are the decisions of the regulatory authority (entity in charge of regulation) subject to a general administrative procedures law?
BII04	Can affected parties request reconsideration or appeal adopted regulations to the relevant administrative agency (all sectors)?
T8	Dispute resolution mechanism exist
T9	Appeals to regulatory decisions are allowed
BII05	Are national policy and regulatory frameworks technology and service-neutral ?
BII07a	Do ministries/regulatory agencies conduct ex-post policy reviews?
BII07b	Do ministries/regulatory agencies conduct policy rolling reviews?
BII08	Are the laws (all sectors) that are currently in effect available on a single website managed by the government?
BII09	Is public access to information ensured and fundamental freedoms protected, in accordance with national legislation and international agreements?
BII10	Are there ethics rules in place that apply to the regulator's staff, including Head/Chairperson and Members/Commissioners (e.g., improper acceptance of gifts, personal and financial conflicts of interest, post-employment obligations, etc.)?
4	**Collaborative governance (16 individual indicators)**
BI01	Collaboration with (Independent) Spectrum Authority
BI02	Collaboration with (Independent) Broadcasting (content) Authority
BI03	Collaboration with Cyber security agency
BI04	Collaboration with CERT
BI05	Collaboration with (Independent) Data Protection Authority

(continued)

Benchmark/ Indicator nb*	Benchmark/ Indicator name
BI06	Collaboration between ICT ministry OR ICT regulator AND Information Society Agency
BI07	Collaboration with (Independent) Finance Regulator
BI08	Collaboration with Energy regulatory Authority
BI09	Collaboration with Transport regulatory Authority
BI10	Collaboration with (Independent) Competition Authorities
BI11	Collaboration with Postal regulation Authority
BI12	Collaboration with (Independent) Consumer Protection Authority
BI13	Collaboration with Ministry of Health (e-health)
BI14	Collaboration with Ministry of Education (e-education)
BI15	Collaboration with Ministry of Environment (e-waste)
BI16	Collaboration with Ministry of Economic development OR similar focusing on a single or a subset of economic sector/s, e.g., Industry, Agriculture, Fishery)
5	**Stakeholder engagement (5 individual indicators)**
T5	Public consultations mandatory before decisions
BII01	Are public consultations designed as a tool to gather feedback from national stakeholders and guide regulatory decision-making?
TIV12	Do codes of conduct exist (voluntary or enforceable/required by regulator)?
BII06a	Are there mechanisms for regulatory experimentation?
BII06b	Are there regulatory sandboxes for digital financial inclusion?
6	**Legal instruments for ICT/telecom markets (17 individual indicators)**
BIII06	Does a regulatory framework exist for ICT accessibility for persons with disabilities?
BIII11b	Does a National Emergency (Telecommunications) Plan exist?
BIII12a	Does an official register or a mapping exist in your country of all telecom-munication/ICT infrastructure?
T22	Types of licences provided
T23	License exempt
T24	Operators required to publish Reference Interconnection Offer (RIO)
T25	Interconnection prices made public
T26	Quality of service monitoring required
T27	Infrastructure sharing for mobile operators permitted
T28	Infrastructure sharing mandated
T29	Co-location/site sharing mandated
T30	Unbundled access to the local loop required

(continued)

Benchmark/ Indicator nb*	Benchmark/ Indicator name
T31	Secondary trading allowed
T32	Band migration allowed
T33	Number portability available to consumers and required from fixed-line operators
T34	Number portability available to consumers and required from mobile operators
T35	Individual users allowed to use VoIP
7	**Legal instruments for digital markets (16 individual indicators)**
BIV08b	Has your country adopted any policy/legislation/regulation related to e-apps and/or m-apps linked to Agriculture/Science/Financial Services?
BIV09a	Does it includes a strategy, policy or initiative focusing on IoT? Or applied any measure regarding spectrum management and availability for IoT?
BIV09b	Has your country adopted any policy/legislation/regulation related to cloud computing?
BIV09c	Has your country adopted a national strategy, policy or initiative focusing on AI?
BIV05	Has your country adopted a forward-looking or innovative national strategy, policy or initiative focusing on spectrum (e.g., IMT-2000, 5G, FWA, satellite, HAPS, 6 GHz)?
BIII03	Is there a digital identity framework in place?
BIII04	Is there an e-gov/ Digital first government National e- government strategy or equivalent?
BIII05	Has your country adopted e-waste regulations or e-waste management standards?
BIII10a	Are there formal data protection rules (e.g., law, regulations)?
BIII07	Is there a legislation/regulation for child online protection?
BIII08a	Has your country adopted any policy/legislation/regulation related to Smart Cities?
BIII08b	Has your country adopted any policy/legislation/regulation related to e-Health or Smart Health?
BIII08c	Has your country adopted any policy/legislation/regulation related to e-applications and/or m-applications on Education and Learning?
BIII09a	Is there cybersecurity/cybercrime legislation or regulation?
BIII12b	Are there any cross-sector (ICT and other) infrastructure sharing or fibre co-deployment regulations/ agreements/promotion initiatives in your country?
BIV06	Are there policies and regulations for e-commerce/e-transactions?
8	**Market rules (17 individual indicators)**
T37	Level of competition in local and long distance (domestic and international) fixed line services

(continued)

Benchmark/ Indicator nb*	Benchmark/ Indicator name
T38	Level of competition in IMT (3G, 4G, etc.) services
T39	Level of competition in cable modem, DSL, fixed wireless broadband
T40	Level of competition in leased lines
T41	Level of competition in International Gateways
T42	Status of the main fixed line operator
T43	Legal concept of dominance or SMP
T44	Criteria used in determining dominance or SMP
T45	Foreign participation/ownership in facilities-based operators
T46	Foreign participation/ownership in spectrum-based operators
T47	Foreign participation/ownership in local service operators/long-distance service operators
T48	Foreign participation/ownership in international service operators
T49	Foreign participation/ownership in Internet Service Providers (ISPs)
T50	Foreign participation/ownership in value-added service providers
BIV04	Is there a forward-looking competition policy, law or regulation applied to digital markets?
BIV10	Are there specific taxes on the telecom/digital sector OR on Internet services?
BIV11	Are there regulatory incentives targeted at network operators or other digital market players?
9	**Regional and international cooperation (5 individual indicators)**
BIV01	Does your country belong to regional integration initiatives with ICT chapters?
BIV02	Has your country have made commitment to facilitate trade in telecommunications services?
BIII09b	Has your country signed or ratified the Budapest convention on cybersecurity?
BIII10b	Has your country signed on international agreements determining jurisdiction and/or managing cross border flows on data privacy?
BIII11a	Has your country signed or ratified the Tampere convention for communications in emergency situations?

Note: Indicators from the ICT Regulatory Tracker are prefixed with 'T'; indicators from the G5 Benchmark are prefixed by 'B'.

Office of the Director
International Telecommunication Union (ITU)
Telecommunication Development Bureau (BDT)
Place des Nations
CH-1211 Geneva 20
Switzerland

Email: bdtdirector@itu.int
Tel.:   +41 22 730 5035/5435
Fax: +41 22 730 5484

Office of Deputy Director and Regional Presence
Field Operations Coordination Department (DDR)
Place des Nations
CH-1211 Geneva 20
Switzerland

Email: bdtdeputydir@itu.int
Tel.:   +41 22 730 5131
Fax: +41 22 730 5484

Digital Networks and Society (DNS)

Email: bdt-dns@itu.int
Tel.:   +41 22 730 5421
Fax: +41 22 730 5484

Digital Knowledge Hub Department (DKH)

Email: bdt-dkh@itu.int
Tel.:   +41 22 730 5900
Fax: +41 22 730 5484

Partnerships for Digital Development Department (PDD)

Email: bdt-pdd@itu.int
Tel.:   +41 22 730 5447
Fax: +41 22 730 5484

Africa

Ethiopia
International Telecommunication Union (ITU) Regional Office
Gambia Road
Leghar Ethio Telecom Bldg. 3rd floor
P.O. Box 60 005
Addis Ababa
Ethiopia

Email: itu-ro-africa@itu.int
Tel.:   +251 11 551 4977
Tel.:   +251 11 551 4855
Tel.:   +251 11 551 8328
Fax: +251 11 551 7299

Cameroon
Union internationale des télécommunications (UIT)
Bureau de zone
Immeuble CAMPOST, 3e étage
Boulevard du 20 mai
Boîte postale 11017
Yaoundé
Cameroon

Email: itu-yaounde@itu.int
Tel.:   + 237 22 22 9292
Tel.:   + 237 22 22 9291
Fax: + 237 22 22 9297

Senegal
Union internationale des télécommunications (UIT)
Bureau de zone
8, Route des Almadies
Immeuble Rokhaya, 3e étage
Boîte postale 29471
Dakar - Yoff
Senegal

Email: itu-dakar@itu.int
Tel.:   +221 33 859 7010
Tel.:   +221 33 859 7021
Fax: +221 33 868 6386

Zimbabwe
International Telecommunication Union (ITU) Area Office
TelOne Centre for Learning
Corner Samora Machel and
Hampton Road
P.O. Box BE 792
Belvedere Harare
Zimbabwe

Email: itu-harare@itu.int
Tel.:   +263 4 77 5939
Tel.:   +263 4 77 5941
Fax: +263 4 77 1257

Americas

Brazil
União Internacional de Telecomunicações (UIT)
Escritório Regional
SAUS Quadra 6 Ed. Luis Eduardo Magalhães,
Bloco "E", 10º andar, Ala Sul (Anatel)
CEP 70070-940 Brasilia - DF
Brazil

Email: itubrasilia@itu.int
Tel.:   +55 61 2312 2730-1
Tel.:   +55 61 2312 2733-5
Fax: +55 61 2312 2738

Barbados
International Telecommunication Union (ITU) Area Office
United Nations House
Marine Gardens
Hastings, Christ Church
P.O. Box 1047
Bridgetown
Barbados

Email: itubridgetown@itu.int
Tel.:   +1 246 431 0343
Fax: +1 246 437 7403

Chile
Unión Internacional de Telecomunicaciones (UIT)
Oficina de Representación de Área
Merced 753, Piso 4
Santiago de Chile
Chile

Email: itusantiago@itu.int
Tel.:   +56 2 632 6134/6147
Fax: +56 2 632 6154

Honduras
Unión Internacional de Telecomunicaciones (UIT)
Oficina de Representación de Área
Colonia Altos de Miramontes
Calle principal, Edificio No. 1583
Frente a Santos y Cía
Apartado Postal 976
Tegucigalpa
Honduras

Email: itutegucigalpa@itu.int
Tel.:   +504 2235 5470
Fax: +504 2235 5471

Arab States

Egypt
International Telecommunication Union (ITU) Regional Office
Smart Village, Building B 147,
3rd floor
Km 28 Cairo
Alexandria Desert Road
Giza Governorate
Cairo
Egypt

Email: itu-ro-arabstates@itu.int
Tel.:   +202 3537 1777
Fax: +202 3537 1888

Asia-Pacific

Thailand
International Telecommunication Union (ITU) Regional Office
4th floor NBTC Region 1 Building
101 Chaengwattana Road
Laksi,
Bangkok 10210,
Thailand

Mailing address:
P.O. Box 178, Laksi Post Office
Laksi, Bangkok 10210, Thailand

Email: itu-ro-asiapacific@itu.int
Tel.:   +66 2 574 9326 – 8
    +66 2 575 0055

Indonesia
International Telecommunication Union (ITU) Area Office
Sapta Pesona Building
13th floor
JI. Merdan Merdeka Barat No. 17
Jakarta 10110
Indonesia

Email: itu-ro-asiapacific@itu.int
Tel.:   +62 21 381 3572
Tel.:   +62 21 380 2322/2324
Fax: +62 21 389 5521

CIS

Russian Federation
International Telecommunication Union (ITU) Regional Office
4, Building 1
Sergiy Radonezhsky Str.
Moscow 105120
Russian Federation

Email: itumoscow@itu.int
Tel.:   +7 495 926 6070

Europe

Switzerland
International Telecommunication Union (ITU) Office for Europe
Place des Nations
CH-1211 Geneva 20
Switzerland
Email: eurregion@itu.int
Tel.:   +41 22 730 5467
Fax: +41 22 730 5484