Sixth National Telecommunications Plan

1 Introduction

1 This National Telecommunications Plan (NTP) has been adopted by the Government of the Kingdom of Bahrain (Government) in conformity with Article 15 of the Telecommunications Law, as promulgated by Legislative Decree No. 48 of 2002 (Telecommunications Law), which requires the Minister responsible for the telecommunications industry to publish periodically a National Telecommunications Plan with the approval of the Council of Ministers and published in the Official Gazette. The published plan must encompass both the strategic plan for the sector and the general policy of the Government toward the telecommunications sector.

2 This is the Sixth National Telecommunications Plan (NTP6) to be issued since the promulgation of the Telecommunications Law. It sets out the Government's strategic plan and general policy for the telecommunications sector of the Kingdom, covering the three-year period commencing from the date of its publication in the Official Gazette.

3 The Telecommunications Law requires the Telecommunications Regulatory Authority (Authority) to act *"in a manner that is consistent with the objectives of the National Plan for Telecommunications; provided that this shall not be construed to derogate from the independence of the Authority in accordance with the provisions of this Law."*

4 Accordingly, the provisions of this plan, described as Government Policy, have the legal status defined in the Telecommunications Law.

2 The Government's Vision for the Sector

5 The Kingdom of Bahrain aims to become a *"Smart Kingdom"* that harnesses innovative technologies and data-driven solutions to enhance the quality of life for its population, promote sustainable development, and drive economic growth, and foster the competitiveness of the Kingdom. By fostering a robust ecosystem for collaboration between the government, businesses, and residents, the *Smart Kingdom* sets the framework to drive digital transformation.

6 A strategic enabler for the digital transformation in the Kingdom is its telecommunications infrastructure, which is evolving into an important international differentiator and will increasingly contribute to the Kingdom's GDP leading up to 2026.

7 With its resilient and reliable world-class connectivity infrastructure, Bahrain is positioned at the forefront of digital technologies in the GCC and worldwide. By strategically driving the agenda and investing in advanced connectivity infrastructure, security, and sustainability, Bahrain intends to provide its population and businesses with the tools and capabilities necessary to compete. This will attract foreign direct investments and sustain the growth of innovative industries, such as e-commerce, e-health, e-education, and other high-impact sectors.

8 The Kingdom will create an innovative and borderless digital economy by digitalizing the existing economic base and building or attracting new digital and technology players. For this purpose, the Authority provides a leading, liberal regulatory environment and access to ubiquitous international connectivity, allowing national and international players to connect and thrive.

9 Being at the forefront of digital innovation will result in significant benefits for the Kingdom. Bahrain provides support for research and experimentation in emerging digital technologies embedded in its advanced 5G- and fiber-enabled connectivity infrastructure.

10 As such, digital connectivity and emerging technologies are recognized as part of a broader, future-ready ICT ecosystem driven by digitally skilled talents, progressive regulation, and early adoption of the latest and future technologies, including Artificial Intelligence (AI) and Quantum Computing.

11 It is recognized that we are in a period of rapid technological change that will have a profound impact on telecommunications and the broader ICT market structure. To efficiently steer, monitor, and track the execution of the strategic plan and achievement of the targets for the connectivity infrastructure, the Kingdom will build on its flexible pro-

competitive market regime to ensure it can drive its digital agenda that is welcoming to all stakeholders to collaborate and exchange ideas within a trusted environment.

12 With the upcoming National Telecommunications Plan, Bahrain will set forth the strategic roadmap to maintain its leading international position and achieve its targets in line with the *Vision 2030* and *Smart Kingdom* vision, i.e., maximizing benefits for consumers, businesses, government, and the environment.

To cater to those ambitions, the current National Telecommunications Plan will go beyond the scope of its previous versions, given the convergence of telecommunications with digital business models and emerging technologies.

3 Overview of the Government's Strategic Plan and Policy for the Sector

13 The Kingdom's telecommunications infrastructure is set to continue and take on a leading role in the growth of the national digital ecosystem, bolstering attractiveness for international investments, providing the ecosystem for social development, and fostering innovation.

14 In this regard, the Government is proud to confirm that the objectives set in the Fifth National Telecommunications Plan have been largely achieved. Today, the Kingdom, most importantly:

   a. Provides affordable, secure, and high-speed fixed and mobile infrastructure access.
   b. Enables effective and sustainable competition.
   c. Ensures consumer transparency and protection.
   d. Provides a clear future-oriented spectrum allocation plan.
   e. Attracts leading international internet business and content providers.
   f. Provides a comprehensive legislative framework.

15 Furthermore, the National Broadband Network (NBN) has been designated as the exclusive provider of national fiber infrastructure throughout the Kingdom, reaching 500,000 addresses already. Having achieved operational autonomy from the incumbent licensed operator, the NBN now stands as an independent entity. However, other licensed operators (OLOs) retain possession of fiber assets. In light of this, the Government remains confident in the successful execution of the asset transfer program, enabling the NBN to acquire the fiber assets and, therefore, ensuring a seamless transition while maintaining the reliance of the Kingdom's telecommunications fixed and mobile services.

16 Expanding on the Kingdom's past successes, this plan presents a strategic vision for the future, spanning the next three years and beyond. The aim is to integrate the advancements of the Kingdom's telecommunications and digital ecosystem, thereby propelling it towards greater growth and prosperity:

   a. The Kingdom transforms into a "post-gigabit" society, offering high-capacity and high-quality services that are ubiquitously available to the entire population and all businesses independent of location, economic status, or health conditions.
   b. Independent and diverse international connectivity and computing power are available at reasonable cost and high capacity to support the Kingdom as a *Cloud Hub.*

c. A digital rollout process enables seamless collaboration between public stakeholders, the NBN, Mobile Operators, and the private sector to drive the expansion of the Kingdom's digital economy.

d. A thriving innovation ecosystem aims to make the Kingdom a *Tech Innovation Hub*, facilitating the connection of leading telecommunications providers, technology players, and research institutions working at the forefront of innovation.

e. Adoption of state-of-the-art cyber security and data privacy guidelines and laws allows seamless integration of the Kingdom into international data exchange and ensures resilience against ever-increasing international cyber threats.

f. A national AI policy, flexible regulations, governance framework, and national "sandbox" approach ensure that the transformative power of AI is efficiently and sustainably used to support the agenda for the digital economy, society, and consumer.

g. The drive to become a fully sustainable nation creates the need for new green data centers (DCs) and pushes for increased sustainability standards along the telecommunications value chain.

h. The Kingdom prepares to be "future ready" by strategically dedicating resources for investing in future technologies such as 6G, open data models, and quantum computing, which will be seamlessly integrated and leveraged across the ICT ecosystem.

i. A digital ecosystem governance framework, building on the pro-competitive market framework, enables efficient collaboration between private and public stakeholders to ensure seamless integration with the telecommunications infrastructure.

j. To facilitate the above objective, the Government will strive to bolster the Kingdom's regional and international recognition as a leader in telecommunications infrastructure and ICT, with the Kingdom at the forefront in the GCC region and in the top 10 internationally.

4 Key Policies for the Telecommunications Sector Going Forward

1. National Infrastructure and International Connectivity

17 A robust domestic infrastructure has been established throughout the entire Kingdom of Bahrain, and ambitious plans are in progress to significantly enhance international connectivity. This advanced infrastructure is poised to function as the fundamental cornerstone of the nation's rapidly expanding ICT ecosystem, ensuring long-term sustainable growth.

18 Considering its densely populated urban landscape, the Kingdom acknowledges the importance of sustained investments in its telecommunications infrastructure. This commitment not only preserves its current competitive positioning through higher bandwidth and cost-effectiveness, but also fosters an environment conducive to attracting international investments and stimulating innovation.

1.1 International Connectivity

1.1.1 International Submarine Cable Deployment

19 As stated in NTP5, the Government continues to ensure that international capacity is sufficiently provided, diverse, redundant, and resilient to act as a catalyst in propelling the growth of the digital ecosystem.

20 The country has an ample and flexible supply of international capacity for cross-border data flow.

21 Moreover, with new investments in international submarine cables by local licensees materializing, *SEA-ME-WE 6* and *Al Khaleej* by Batelco as well as *2Africa cable* by STC, the challenges of diversity and aging infrastructure in the international cable network will be addressed and capacity expanded.

22 The Government aims to attract more investments into international cables to promote broader economic investments and bolster national security. However, the Government recognizes the need for more international physical diversity and reduced dependence on transit arrangements.

23 *Accordingly, Government policy in this area is as follows:*

   a. *The* Government, together with the Authority, will seek to facilitate further investment in cable consortia, work with neighboring countries to develop rights of use, and ensure that diversity is provided across the Kingdom's sub-sea corridors.

1.1.2 BIX Asset Transfer

24 The Government supports the development of universal access to the internet invested in the Kingdom's first Internet Exchange (IX). Following market liberalization, commercial companies are now providing IX services. BIX also has the landing rights for the TATA submarine cable. Both BIX's IX and the provision of access to the TATA cable are underutilized.

25 After careful consideration, the Government has decided to discontinue the operations of BIX and transfer its assets, including its landing station and landing party agreement to the private market.

26 *Accordingly, Government policy in this area is as follows:*

a. *The Government will request the Authority to undertake the necessary processes to transfer the assets of BIX to the private market so that its assets are optimally utilized for the benefit of the broader market.*

1.2 National Gigabit Society

1.2.1 Gigabit Speeds and Fiber Coverage

27 As of August 2023, the Kingdom has satisfactorily progressed on the rollout of fiber broadband, reaching coverage of 94 percent of inhabited households which reflects 87 percent of overall addresses. Moreover, 100 percent of businesses are fiber-covered throughout the country. Therefore, the nation is widely supplied and enabled with gigabit capacities to engage in the digital economy and society. Today, the Kingdom has one of the highest internet usage in the world with 100% of the Kingdom's population already using the internet.

28 Going forward, the Kingdom expects rapid adoption of digital business models among enterprises and consumers, necessitating greater bandwidth and reduced latency in both fixed and mobile network services.

29 In response to these evolving demands, the Kingdom must focus on expanding network capacities and remain steadfast in its commitment to fostering a digitally inclusive society. With high ICT literacy and among the lowest broadband tariff pricing in the GCC, the Kingdom offers the foundation for digital accessibility for its people and businesses and will continue enhancing the consumer experience.

Accordingly, Government policy in this area is as follows:

30 Peers in the GCC and across the globe have set ambitious targets to transform into *national gigabit societies* and unlock the inherent benefits of improved quality of life

through access to advanced, high-capacity digital services. The Kingdom is at the forefront of delivering advanced network capabilities with its country-wide fiber network coverage. It has already achieved 100% 5G coverage. The Kingdom must set bold ambitions to retain its leading position to become a post-gigabit society, and ensures it benchmarks its capabilities against the best in the world. To advance its leading position,

a. *The Government will promote access to high-speed broadband, offering speeds of over 1 Gbps for residential users and 10 Gbps symmetric speeds for businesses at affordable prices. The Kingdom is committed to providing world-leading capabilities and speeds for businesses by 2025 during the term of this National Telecom Plan 6.*

1.2.2 Ensure ubiquitous fiber broadband access

31 As part of its national Economic Recovery Plan 2023-2026, the Government outlined its objective to ensure ubiquitous fixed broadband access, i.e., 100% coverage.

Accordingly, Government policy in this area is as follows:

a. *The Government believes that all residential and business users should be able to access fiber services. Therefore, the Government will ensure fiber is provided in all new developments. The Authority will take the necessary action to ensure that all consumers can buy broadband services within a reasonable time of placing an order.*

1.2.3 Consumer Experience

32 The Kingdom has set a leading international benchmark regarding consumer transparency and awareness of service pricing and availability.

33 Consumer awareness is ensured through target campaigns run via national TV and other media channels. Moreover, consumers are encouraged and provided with digital tools to file complaints with the respective authorities. Consistently following up on consumer complaints will continue to be a strategic priority to augment the consumer experience and protect consumer rights.

34 All consumers should be able to participate in the digital economy and experience social and economic benefits both nationally and abroad. The Authority will continue to promote consumers' ability to access necessary services.

35 The Authority's commitment is to protect and empower consumers and will remain dedicated to its role by fostering a consumer-centric telecommunications industry. The

Authority will continue to ensure that consumers are safeguarded, empowered to make informed decisions, and protected in a rapidly evolving telecom sector.

36 The Authority commits to educating the public about potential online risks, offering clear guidelines for secure online behavior, and fostering a culture that promotes responsible behavior for online platforms and consumers. This aims to empower and enable the community with the knowledge and resources needed to navigate the digital landscape safely and securely.

37 *Accordingly, Government policy in this area is as follows:*

a. *The Authority, with relevant stakeholders, shall increase the awareness of online security measures, given the increase in fraudulent activities across various technologies, as part of its ongoing commitment to minimize and promptly address online fraud.*

b. *The Authority should continue publishing Quality of Service/Experience reports, which are developed using international best practices, enabling consumers to make informed decisions on the selection of their service provider of choice.*

c. *The Authority, in collaboration with concerned stakeholders, will closely monitor consumer complaints and follow up to ensure the resolution of consumer complaints.*

d. *The Authority will take necessary measures to ensure all users are advised and informed about possible online risks. Recognizing that many online platforms provide services from outside the Kingdom, the Authority will take appropriate action in collaboration with others to ensure necessary online safety measures can be introduced.*

1.3 Developments in the Mobile Market

38 The Kingdom ranks among the leading countries with 100% 5G mobile coverage of at least two mobile network operators.

39 Moreover, the Authority has developed and continuously optimizes the national spectrum allocation plan catering to the evolving requirements of the digital economy, particularly for 5G and IoT technologies, Mobile Private Networks (MPNs), and satellite connectivity.

40 Given its market conditions, the Kingdom remains committed to facilitating the efficient allocation of resources across the ecosystem for licensed mobile operators and other spectrum users. The Kingdom wishes to ensure that Bahrain's mobile market remains one of the most advanced in the world, while current operators sustainably serve the

interests of all users. Therefore, unless market conditions change, there is no compelling reason to award a fourth public mobile license.

1.3.1 Spectrum allocation

41 Spectrum is an essential input to the operation of mobile networks. The Government recognizes the importance of ensuring that mobile network operators have, at all times, adequate allocation of spectrum to enable emerging mobile technologies and best-in-class services.

42 *Accordingly, Government policy in this area is as follows:*

    a. *The Authority will continue to assess the spectrum requirements of public, private, and government mobile network providers to ensure that the Kingdom remains at the forefront of mobile technologies.*

    b. *Where the Authority determines that additional spectrum should be made available, it will ensure that the award of the additional spectrum will be in line with international best practice and is reflective of the value of this scarce national resource.*

1.3.2 Fiber-based products to support mobile services

43 The development of new mobile technologies and architectures will mean that various types of mobile sites will need to be deployed to ensure that the Kingdom remains a global leader in using advanced mobile capabilities. These new types of sites, as well as the current mobile infrastructure, will require to be supported by a fit-for-purpose fiber solution.

44 A vibrant mobile market and eco-system requires all consumers to access the latest technologies in the different areas of the Kingdom with good quality of experience at globally competitive pricing.

45 *Accordingly, Government policy in this area is as follows:*

    a. *The Authority shall take such measures as necessary to ensure the NBN offers suitable fiber capabilities at appropriate prices to support the continued development of the mobile ecosystem.*

1.3.3 Access to Public Infrastructure

46 The Public Radiocommunications Station (PRS) Regulation published by the Authority in 2018 grants licensed mobile operators the right to access public infrastructure assets. This includes monopoles on street works, and wall mounts.

47 *Accordingly, Government policy in this area is as follows:*

a. *The Government shall collaborate with relevant public stakeholders to promote the current PRS regulation to make access to government assets available at reasonable rates. This includes lamp posts, bridges, and buildings which should be available to licensed mobile operators to deploy their infrastructure.*

1.4 Regulatory Support

48 The Kingdom has already established regulatory policies and frameworks to facilitate the rollout of network infrastructure as well as the provision of telecommunications and ICT services. Acknowledging the advanced state of its infrastructure, the Kingdom will take further actions to facilitate investment into the deployment of infrastructure that supports seamless customer experience and the provision of advanced technologies.

1.4.1 Mobile Network Permitting Process

49 The Government has established a digital public process for building permits that supports the mobile network operators' rollout process. The Authority is a stakeholder in the process.

50 Given that the Kingdom has outlined ambitious plans to develop new residential and commercial properties, seamless digital collaboration among key stakeholders, such as developers, mobile network providers, and other concerned stakeholders, will be imperative. For this purpose, an enhanced network rollout process will support project management and facilitate efficient decision-making in executing the Kingdom's mobile infrastructure expansion.

51 *Accordingly, Government policy in this area is as follows:*

a. *The Government will ensure that all Government stakeholders enhance their processes to enable mobile infrastructure to be deployed so that it is available as an integral part of the residential and commercial property developments.*
b. *The Authority will set clear guidelines and milestones in consultation with concerned stakeholders to ease and speed up access to building permits.*
c. *The Authority will regularly review such milestones and take actions to ensure timely approvals.*

1.4.2 In-building Infrastructure Guidelines

52 Within NTP5, deploying in-building telecommunications infrastructure (IBS), i.e., in-building mini ducts, access points, or other physical infrastructure for new developments, has been mandated.

53 In this regard, the Authority has published the In-Building Telecommunications Access Facilities Guidelines and adopted the *Adoption Procedure of Telecommunications System for the Private Development.*

54 The Government acknowledges challenges to consistently applying the IBS Code of Practice within new development projects developed by the Authority. The enforcement of the code of practice for in-building fiber infrastructure deployment will enable all users to access telecommunications services more rapidly, increasing service quality and availability of a future-ready infrastructure.

55 *Accordingly, Government policy in this area is as follows:*

    a. *The Authority, in collaboration with concerned stakeholders, will regularly review the Code of Practice to confirm its continued alignment with appropriate industry standards.*

    b. *The Authority supported by the Government will ensure the adoption of the Code of Practice within new development projects with concerned stakeholders.*

1.4.3 Satellite Connectivity Framework

56 The Authority has allocated spectrum and issued earth station and non-stationary low earth orbit satellite licenses, putting the Kingdom at the forefront in the GCC region and encouraging the development of commercial satellite services.

57 The Government recognizes the increased importance of satellite systems supporting security, commercial and scientific applications. Therefore, The Kingdom must ensure it is well-positioned to take advantage of these new developments.

58 The Government emphasizes a robust ecosystem to advance access to commercial satellite connectivity and space activities. This involves facilitating access to suitable land plots to set up earth stations.

59 *Accordingly, Government policy in this area is as follows:*

    a. *The Authority should continue to ensure that its regulatory framework supports the development of new satellite services and facilities. In addition, it will encourage and facilitate early deployments and testing of new satellite and space applications.*

    b. *The Government will facilitate access to suitable land to support the deployment of satellite facilities.*

2. Digital Transformation

60 Innovation and progress in digitalization occur at the nexus of the physical and software layers. Consequently, capitalizing on the pervasive 5G network infrastructure for IoT solutions, harnessing the power of cloud computing, and integrating advanced technologies such as AI is paramount for Bahrain's growth and development across industries.

61 With strategic investments into its national talent pool, SME digitalization programs, and facilitating innovation, the Kingdom has taken essential steps to become a leading player in ICT application development. This ambition will continue with strategic leaps to promote innovation clusters and establish a coordinated approach to leveraging the world-class physical infrastructure.

2.1 Technology Innovation & Rollout

2.1.1 Smart Kingdom Concept

62 The Government is already exploring various *Smart Kingdom* initiatives, such as smart traffic lights and smart cooling systems within selected geographic areas as well as verticals such as smart banking and smart factories.

63 Currently, Smart Kingdom initiatives are not part of an overall program. This means that, while it leverages sector expertise, learnings may not be shared across the broader ecosystem. To fully leverage the Smart Kingdom concepts and the development of the digital eco-system, the Government needs to facilitate the establishment of innovation clusters.

64 *Accordingly, Government policy in this area is as follows:*

The Government, in collaboration with other concerned stakeholders, will ensure the following strategic pillars align with the vision of a Smart Kingdom:

a. *Develop a strategy and vision guiding the integration of the physical infrastructure with ICT applications to enable smart verticals and preempt initiative silos.*

b. *Develop an integrated governance to drive technological advancement and develop Smart Kingdom solutions via innovation hubs, supporting startups and encouraging public-private partnerships.*

c. *Promote smart applications within high-impact sectors such as mobility, health, and education to improve competitiveness.*

d. *Partner with leading international initiatives and expand the national talent pool, as well as support startups to gain access to required capabilities.*

e. *Raise public awareness for Smart Kingdom services to bolster adoption and education.*

2.1.2 National AI Policy

65 In recent years, AI has emerged as a transformative technology with the potential to revolutionize service offerings, foster innovation, and enhance the quality of life for its citizens. However, AI is in the early stages of development with the potential to rapidly change. As a result, many countries and commercial organizations are engaged in AI development, ranging from cutting-edge research and technology development to the creation of regulatory frameworks that ensure its responsible use.

66 The Kingdom's advanced economy and open, pro-competitive, flexible regulatory framework is well positioned to take advantage of AI development.

67 With the development of a national AI strategy and supporting policies, the Kingdom will be prepared for the requirements of the AI landscape, which will move it closer to becoming a hub of AI excellence. This will enable the shift towards an AI-facilitated digital economy, harnessing the benefits of innovation and guaranteeing that AI positively impacts all sectors and regions.

68 In line with the objectives of the National Digital Economy Strategy, the Kingdom will develop an AI strategy encompassing the four main pillars of ensuring an overarching integrated approach, collaborative AI governance, developing key strategic enablers, and fostering proper and timely adoption across high-impact sectors. Within these efforts, the Kingdom will ensure the alignment of current and future AI applications with national values and beliefs, and particularly the best use for the benefit of the society.

Accordingly, Government policy in this area is as follows:

69 Strategy Development and Progress Monitoring

a. *Develop a national AI strategy to guide the Kingdom's approach and investments in AI experimentation and promote adoption across sectors and the population.*

b. *Establish and implement flexible regulations, guidelines, and if needed, standards for ethical AI development and use, promoting fairness and transparency and seeking to ensure a positive impact on society at large.*

c. *Establish a national oversight council, bringing together respected leaders in AI across industry, academia, and the public sector to consult and steer on the strategic priorities and initiatives that ensure momentum.*

d. *Engage with other governments, industry, and international organizations to share experiences and learnings to ensure that national AI strategic policies are appropriate.*

e. *As part of the regulatory framework, develop a sandbox concept to enable experimentation and testing to position the Kingdom as a leading location for trialing new AI technologies.*

f. *Regularly publish updates of AI guidelines, standards, and initiatives.*

70 Collaborative AI Governance

a. *Implement a governance framework enabling efficient collaboration between concerned public and private stakeholders across all sectors.*

b. *The Authority, as the AI regulatory entity, shall create a conducive regulatory environment, with active engagement and participation of concerned stakeholders, for AI innovation and adoption, fostering a progressive atmosphere across the private sector.*

c. *Regularly monitor and track economic, societal, and, where applicable, environmental implications of AI adoption.*

d. *Collaborate and coordinate nationally, regionally, and internationally, participating in forums and initiatives to share best practices, expertise, and resources to shape AI governance collectively.*

71 Conducive AI

a. Ecosystem *Support the development of skilled AI developers and AI-related professions, fostering the national talent pool and workforce in the private sector, government institutions, and academia.*

b. *Facilitate national placement of international talent through easier and long-term work visas and permits.*

c. *Collaborate with concerned stakeholders to ensure data access and updates for AI applications.*

d. *Promote high network infrastructure and data security, particularly PDP and cross-border data flow regulations facilitated by the data sovereignty law, ensuring trust in AI applications.*

e. *Support the establishment of innovation hubs, technology parks, incubators, and research partnerships to nurture AI startups and businesses, facilitating funding, mentorship, and networking opportunities.*

f. *Provide awareness programs, e.g., training courses available to the public.*

72 Adoption across High-Impact Sectors

a. *Develop sector-specific AI strategic plans aligned to the overarching national strategy to identify impactful initiatives and use cases and foster AI innovation and commercialization across sectors.*

b. Explore early-stage funding mechanisms on a sector basis to encourage AI application development, e.g., innovation vouchers or grants.

c. Promote and facilitate a seamless transition from state-of-the-art research to market commercialization, particularly after successful commercial pilots.

d. *Promote interoperability standards and change management plans that allow AI systems to work seamlessly with existing infrastructure and technologies within and across sectors.*

2.1.3 Ensure National Readiness for Future Technologies

73 Upcoming technologies promise to revolutionize communication, information processing, and data sharing. With lightning-fast connectivity, unparalleled computational power, and seamless data exchange, the Kingdom will act at the forefront of digital transformation.

74 Given its resource endowment, the Kingdom will collaborate with leading international institutions and technology players to explore upcoming advanced technologies and related commercial use cases, boosting the digital economy.

2.1.3.1 Next Generation Infrastructure Network Technology

75 Bahrain is poised to establish itself as a future-ready nation by proactively investing in network technologies. For example, 6G is expected to offer network speeds exponentially faster than existing solutions and capabilities as well as new capabilities that go beyond what is available today. The Kingdom will be well positioned to capitalize on the benefits post-2030, propelling the national digital transformation.

76 *Accordingly, Government policy in this area is as follows:*

a. The Authority will continue international collaboration for 6G research to ensure Bahrain is one of the first countries capable of deploying the technology.

b. The Government, together with the Authority, will regularly screen the market to identify technological advancements and propose strategic programs to leverage the underlying potential within the market.

2.1.3.2 Open Data Policy and Databank

77 To sustain its position as an ICT applications hub and enable the *Smart Kingdom* vision, the Government will advance its foundations to enable data-driven decision-making and facilitate an integrated digital ecosystem in applications technology.

78 In this regard, advanced open data platforms or digital twins allow sharing and testing among individuals and organizations, facilitating increased transparency, innovation,

and efficiency in various verticals such as healthcare, education, and government services.

79 *Accordingly, Government policy in this area is as follows:*

  a. *The Government will collaborate with relevant stakeholders across both public and private sectors to explore the establishment of an open data platform and further extend it to create a digital twin model for relevant infrastructure.*

  b. The Government, together with the Authority, will regularly screen the market to identify technological advancements and propose strategic programs to leverage the underlying potential within the market.

2.1.3.3 Next generation Computing Technology

80 Quantum computing and other emerging technologies are rapidly advancing the use and analysis of data with the inherent potential to revolutionize services such as cryptography, telecommunications network optimization, and AI.

81 Similar to international peers, efforts to develop quantum computing capabilities in the Kingdom are still in their nascent stages. Nonetheless, the Government recognizes the need to stay on par with international explorations to maintain its competitive edge.

82 *Accordingly, Government policy in this area is as follows:*

  a. *The Government will encourage and support universities and private sector entities to collaborate on quantum computing research projects. This shall be achieved through fostering strategic partnerships with regional and international stakeholders to share knowledge, resources, and expertise.*

  b. *The Government, together with the Authority, will regularly screen the market to identify technological advancements and propose strategic programs to leverage the underlying potential within the market.*

2.2 National Human Capital

83 The Kingdom has emphasized developing its education and research ecosystem to build the required telecommunications and ICT capabilities. In recent years, with Tamkeen, universities, research centers, and other entities, the training and placement of national workforce and talents has been bolstered along with foundational research. However, given the size of its national population, further emphasis on telecommunications and ICT talent development as well as international expertise attraction, must be exerted in a collaborative effort to explore the next leaps in the telecommunications infrastructure and ICT service offering.

84 *Accordingly, Government policy in this area is as follows:*

a. *With a digital-first approach, the Government will train all government ICT staff to support digital decision-making and engagement with the broader digital ecosystem.*

b. *The Government will collaborate with concerned stakeholders to support expanding the available talent pool through a multi-faceted approach, including facilitating public-private partnerships, enhancing university curricula, providing training programs, offering relevant certifications, and endowment of research facilities.*

3. Investment Attraction

85 With its advanced national telecommunications infrastructure and qualified workforce, the Kingdom has multiple differentiators to attract international telecommunications and technology players into the country. However, with peer countries building dedicated innovation and economic zones to attract talent and foreign direct investments, the Government acknowledges rising competition.

86 With the *Bahrain Digital Hub,* the Kingdom intends to position and differentiate itself as the preferred investment location in the GCC. The Kingdom positions itself well to attract investment; the Kingdom needs to encourage new development by facilitating innovation clusters (or geographic locations)) and leveraging its program to support the necessary eco-systems needed for start-ups and businesses.

3.1 Cloud Hub

87 Bahrain has established itself as a *Cloud Hub,* allowing interested parties to establish cloud capabilities in the Kingdom under favorable conditions. As such, the *Kingdom* will host large-scale data center operators, connectivity providers, and hyperscalers within an attractive investment and infrastructure ecosystem. Among other benefits, this includes access to the necessary advanced infrastructure capabilities, enabling the Kingdom to differentiate itself from other GCC countries.

88 As a *Cloud Hub,* the Kingdom intends to diversify its cloud computing capacity access, decrease international connectivity costs, and improve international data access.

89 *Accordingly, Government policy in this area is as follows:*

The Government in collaboration with concerned stakeholders will ensure the following key enablers:

a. *The Government will facilitate locations to establish the required infrastructure and initiatives, in collaboration with the public and private sectors.*

b. *The Authority will facilitate the provision of the necessary infrastructure capability need to support the Cloud Hub concept by both existing licensed operators as well as potential new service providers.*

c. *The Government notes that it is already possible to offer transit connectivity (i.e., connectivity between two locations outside the Kingdom) under favorable economic and regulatory conditions.*

d. *The Government in collaboration with the public and private sectors will facilitate the availability of supporting infrastructure, including utility infrastructure on preferential terms and conditions.*

e. *The Government will explore the potential incentives and/or exemptions to be provided to parties setting up their Cloud Hub businesses.*

3.2 Tech Innovation Hub

90 As a *Tech Innovation Hub,* the Government aims to encourage innovations and experimentations in advanced technologies and IoT use cases, including autonomous vehicles, drones, healthcare solutions, and more. For this purpose, being a *Tech Innovation Hub* would act as an innovation testbed, enabling international technology players and startups within a sandbox approach to foster innovation and experimentation.

91 Taking innovation from trial to commercialization as part of the *Tech Innovation Hub concept* will foster the Kingdom's recognition of being at the forefront of digital transformation.

92 *Accordingly, Government policy in this area is as follows:*

The Government, in collaboration with concerned stakeholders, will ensure the following key enablers:

a. *The Authority will continue to support innovation with liberal regulations and licensing.*
b. *The Government will explore the potential incentives and/or exemptions to be provided to parties setting up their business as part of the Tech Innovation Hub concept.*

3.3 Foreign Direct Investment (FDI) Promotion

93 With EDB and other stakeholders, the Kingdom has resourceful entities in place to promote Bahrain as a preferred foreign direct investment destination. With the *Bahrain Digital Hub,* another strong value proposition will be in place to boost the ICT ecosystem and access to international connectivity.

94 *Accordingly, Government policy in this area is as follows:*

a. *The Government will collaborate with concerned stakeholders to market and promote the Bahrain Digital Hub.*

4. Digital Safety and Cyber Security

95 The telecommunications sector holds a vital role as part of the Critical National Infrastructure (CNI) sectors. With a secure digital environment comprising strong cybersecurity, data protection, and cross-border data flow posture, the Kingdom enables businesses to protect their intellectual property and sensitive data, giving them a competitive edge in the global market.

4.1 Cyber Security

96 The NCSC developed a comprehensive national cyber security strategy that addresses the needs of CNI sectors. This strategy encompasses a systematic approach to identify, protect, and respond to potential cyber threats, ensuring the resilience and security of vital telecommunications assets and services in the Kingdom.

97 The Authority, in cooperation with NCSC, has ensured sector-specific guidelines, including Cyber security controls, national risk assessment framework, and cyber trust maturity model. This allows the telecommunications sector to be prepared for incidents, prioritize risks, and develop awareness throughout the ecosystem.

98 *Accordingly, Government policy in this area is as follows:*

a. *The Authority will ensure the implementation and adherence of all sector stakeholders to the present and future requirements outlined in the national cybersecurity strategy and set out in the framework and standards developed by the Authority.*

b. *The Government, in collaboration with other stakeholders, will ensure recognition by leading international indices on cyber security.*

4.2 Network Resilience and Security of Supply Chains

99 Telecommunications infrastructure and services are now essential to support the entire economy. Therefore, the sector must be resilient to faults and natural disasters. In addition, geo-political impacts can potentially impact the availability of telecommunications infrastructure and systems for operators and consumers. The Government recognizes the Authority's work on Network Security and Resilience and the policies and procedures that have been implemented.

100 *Accordingly, Government policy in this area is as follows:*

a. *The Authority will ensure that it takes the necessary actions to ensure the resilience of the Kingdom's telecommunications systems to anticipated incidents and possible disasters. Furthermore, it should ensure that the Kingdom maintains international*

access and access to the internet and that all mobile operators can continue to operate under all anticipated scenarios.

b. *The Authority, in collaboration with the Government, will review possible supply chain issues that may impact the Kingdom's telecommunications sector and develop appropriate mitigation plans. As part of this work, the Authority will examine the potential and applicability of Open RAN developments.*

4.3 Data Protection

101 The Ministry of Justice established a Personal Data Protection Law (PDP) in 2018, building on international best practices to establish privacy protection and data security guidelines. The included robust data security measures enable enhanced collaboration and create new opportunities for innovation and growth within the digital landscape. The Authority has already published sector guidelines to protect and secure telecommunications data.

102 *Accordingly, Government policy in this area is as follows:*

a. *The Authority will monitor national and international developments to ensure its framework reflects present and future requirements on privacy protection and data security.*

4.4 Cross-Border Data Flow

103 As an amendment to the PDP law, the Ministry of Justice developed Order No. 42 of 2022, which sets forth the regulations governing cross-border data flow. The provisions facilitate the data exchange between approved partners, setting a cornerstone for the Kingdom to become an international digital hub.

104 Moreover, the data sovereignty set out in Legislative Decree No. 56 of 2018 for data stored in the Kingdom's DCs further increases the appeal to hyperscalers as it ensures access to and control over their international customers' data.

105 *Accordingly, Government policy in this area is as follows:*

a. *The Government and the Authority will cooperate with concerned stakeholders to augment awareness of the cross-border data flow regulations and data sovereignty as a strategic asset to international service providers.*

4.5 Comprehensive Security Integration and Prosperity Agreement

106 The Kingdom signed the Comprehensive Security Integration and Prosperity Agreement with the United States of America in September 2023. The agreement is expected to further strengthen the existing deep cooperation between the Kingdom and

the United States across a wide range of areas, including collaboration in science, technology and network security. Importantly, the agreement includes the development and deployment of trusted technologies in Bahrain.

107 The agreement provides the basis for extensive cooperation to develop and share relevant standards, guidelines and best practices with a view to both countries securing their networks, communications systems, software, and hardware to prevent inappropriate access to sensitive information on their networks that could disrupt infrastructure or maliciously route data.

108 *Accordingly, Government policy in this area is as follows:*

  a. *The Government, in collaboration with other stakeholders, will leverage the agreement to promote the development and adoption of science, technology and network security in support of the ambitions of the NTP6.*

5. Green Digital Action

109 In alignment with its ambitious goal of attaining net-zero carbon emissions by 2060, the Government is dedicated to bolstering the nation's green infrastructure. This ambition emphasizes promoting sustainable practices within the telecommunications sector, specifically targeting the development and adoption of environmentally friendly hardware, software, and energy solutions.

110 Bahrain has already launched strategic projects developing solar power parks primarily designed for data centers. These solar parks will contribute to the country's renewable energy targets and help power the growing demand for data center services.

111 The Kingdom is committed to further driving the agenda for reduced energy consumption, greenhouse gas (GHG) emissions, and waste along its telecommunications network. Through close monitoring of benchmark indices and encouragement of environmentally-friendly practices as well as active engagement on a global level, international ICT players will be attracted to the Kingdom, given the alignment with their stakeholders' agendas, boosting national innovation and economic growth.

112 *Accordingly, Government policy in this area is as follows:*

a. *The Authority, as part of its regular reporting, will require national licensees to report on the energy consumption as well as the related energy mix.*

b. *The Government will foster the establishment of energy-efficient data centers and release a guideline on energy-efficient data center building practices.*

c. *The Government will encourage the provision of green energy solutions by coordinating with relevant stakeholders to harness renewable energy sources such as solar, wind, and hydropower.*

d. *The Government will encourage the adoption of waste reduction and recycling practices, including network equipment, handsets, or other waste.*

e. *The Government will encourage the adoption of green software solutions. This includes promoting energy-efficient coding and low-data / low-energy AI models through the use of the innovation testbeds.*

f. *The Government will establish a national council, bringing together respected leaders in their fields from across industry, academia, and the public sector to consult on the strategic priorities and initiatives to be undertaken.*

g. *The Government will run a national awareness campaign to sensitize society to the responsible use of electronic devices.*

6. Institutional Governance

6.1 Digital Collaboration

113 With the National Digital Economy Strategy, the Kingdom has a strategic framework and targeted initiatives to bolster innovation and technology investments, advance the government's digital capabilities, and augment its position as an international digital hub. As a resilient telecommunications infrastructure has been identified as a strategic enabler, the Government has to ensure close alignment with all concerned stakeholders.

114 In Bahrain, the digital landscape rapidly evolves, with opportunities to align the vision and coordination among governmental ICT stakeholders. By embracing a commitment to clarity, robust governance, and enhanced collaboration, the Kingdom can unlock significant economic opportunities, bolster international recognition, and attract international investments. This requires coordination across multiple stakeholders, for which the existing governance framework may be inadequate and need to be enhanced.

115 *Accordingly, Government policy in this area is as follows:*

a. *The Government will establish a robust governance structure for the telecommunications and digital sectors to ensure seamless coordination and alignment between concerned stakeholders. The governance will outline the roles and responsibilities of:*
   - *National strategy setting and execution.*
   - *Sectoral digitalization, including local and international players.*
   - *Functional digitalization, including cyber security and data protection.*
   - *Strategic enablers, including infrastructure and human capital development.*

b. *The Government shall undertake a comprehensive exercise to determine the appropriate entities responsible for developing and promoting the private IT sector.*

6.2 Review of Telecommunications Law

116 The revision of the Telecommunication Law will serve as a critical step in facilitating the implementation of the current plan, thus ensuring that the legal framework supports all initiatives for ICT, AI, and emerging technology enablement, as well as the evolving needs of the industry.

117 *Accordingly, Government policy in this area is as follows:*

a. *In alignment with the objectives of the NTP6, the Authority will undertake a comprehensive revision of the existing Telecommunications Law (promulgated by Legislative Decree No. 48 of 2002).*

7. *Implementation*

118 The Government has developed a detailed action plan outlining initiatives it proposes over the next three years. The Government recognizes that its plan for the sector is ambitious.

119 The Government will regularly review and assess the progress of the NTP policies.

120 With NTP6, the Government will maintain the Kingdom's leading position within the telecommunications sector. In collaboration with concerned stakeholders, the government will conduct regular benchmarking against leading international telecommunications and ICT indices, ensuring proper data collection and adherence to reporting standards. This will elevate the Kingdom's international recognition and foster critical reflection on international best practices.

121 The Telecommunications and ICT landscape is evolving at ever-increasing speed and scope. To ensure the success of the Kingdom's vision and telecommunications sector-specific goals, the Government and Authority must engage in regular discussions and foster a collaborative environment with all relevant stakeholders in the sector. The Government will implement a *round table* concept to bring together public and private stakeholders to discuss and plan strategies for enhancing the national infrastructure, exploring emerging technologies, and maintaining momentum for the telecommunications sector.