

ICT – Enabling Growth and Development Sector Strategy 2020 - 2024

As approved by the Board of Directors on 15 January 2020





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Abbreviations



3G, 4G, 5G	3rd, 4th and 5th generation wireless technologies
ABC	Accelerated Broadband Connectivity
ABI	Annual Bank Investment
AI	Artificial Intelligence
Altnet	Alternative Network Operator
CoO	Country of Operation
DC	Data Centre
DOCSIS	Data over Cable Service Interface Specification
DSO	Digital Switch Over
E-Gov	Electronic Government
EFSD	European Fund for Sustainable Development
ESAP	Environmental and Social Action Plan
FTTH	Fibre to the Home
GDPR	General Data Protection Regulation
GET	Green Economy Transition
GHG	Green House Gas(ses)
ICT	Information & Communication Technologies
IFI	International Financial Institution
IoT	Internet of Things

IPO	Initial Public Offering
IPPF	Infrastructure Project Preparation Facility
JV	Joint Venture
KEI	Knowledge Economy Initiative
LC2	Local Currency and Capital Markets Development
LTE	Long-Term Evolution Mobile Technology
MBPS	Megabits per second
NGN	Next Generation Network
P&E	Power & Energy
P&T	Property & Tourism
PD, PE	Policy Dialogue, Policy Engagement
PE	Private Equity
PPP	Public Private Partnership
R&D	Research & Development
SOE	State Owned Enterprise
TA, TC	Technical Assistance, Technical Co-operation
VC	Venture Capital
VCIP	Venture Capital Investment Programme
YTD	Year to Date

Introduction – What's New?



ICT is a key enabler for economic growth and development. In order for the Bank's region to compete successfully on the world stage and respond to the rapid pace of technological disruption, it needs to harness the power of technology and embrace innovation in all areas of economic activity.

Recent progress in automation, artificial intelligence and access to large amounts of data is changing not only the way we communicate, but affects or will affect most, if not all, traditional sectors from finance to health care, from agriculture to manufacturing. The adoption of technology can improve productivity, increase efficiency, lower costs, and correct information asymmetries.

Business models and regulatory frameworks are being challenged and need to adapt to manage technological change. Governments need to implement policies to anticipate and manage the economic and social consequences of technological innovation. The new ICT strategy is designed to address these challenges, and is considered a building block of the larger innovation and technology ecosystem of the Bank. There are three major themes which should be highlighted:

1. Adapting traditional approaches based on past experience

The Bank will adapt its traditional approach to investment, based on experience.

- Privatisation remains a crucial part of the Bank's mandate. In several of the Bank's CoOs, SOEs retain more than 50% market share in the telecommunications sector. Privatisations can prove difficult to implement, with attempts in several of the Bank's CoOs cancelled in recent years. In addition to supporting privatisations (for example by anchoring IPOs or private sales) the Bank will encourage commercialisation and provide pre-privatisation support as a first step in order to deepen the Bank's engagement well ahead of a privatisation event. Support will focus on financial assistance as well as stronger policy engagement to foster pre-privatisation involvement.
- **Capital market transactions** continue to be a major focus of the Bank, and remain an essential area of involvement by the ICT team to contribute to capital market

development. However, transactions can be subject to market volatility and may not finally go ahead despite lengthy preparations. In addition to supporting debt and equity capital market transactions, the Bank will also engage in parallel on bilateral funding opportunities underpinned by TA-funded policy engagement, for example, energy efficiency upgrades. This approach will keep the Bank's dialogue active in the absence of an immediate transaction.

Deeper cross-sectoral co-operation within the Bank will be a crucial tool in the Bank's efforts to fully realise the economic potential of ICT investments, as technology and technological disruption cuts across companies in virtually all sectors, including the digitization of existing and established businesses. Co-operation with IFIs and access to EU funding mechanisms will also be enhanced.

2. More focus on new technologies

The Bank's region has many promising technology and digital solutions companies. Investment in such companies will help drive the Bank's CoOs towards technology-enabled knowledge economies. The Bank will support companies to develop, adopt and adapt innovative technologies such as Big Data, Artificial Intelligence and Internet of Things in the Bank's CoOs. This approach will most likely result in more small equity investments and a deeper engagement with the smaller company (SME) segment in the Bank' CoOs, as well as supporting the development of the local VC eco-system.

3. Sustainability, Inclusion and Narrowing the Digital Divide

Effective investment in the ICT sector promotes sustainability and helps to reduce digital divides. There will be a greater focus on the financing of green and energy efficient technologies. This will include the 'greening' of telecoms and ICT infrastructure itself, as well as supporting the 'greening' of other sectors through technology. ICT is a key enabler which brings the benefits of economic development to a broader population, reaching the parts of society which are disadvantaged due to gender, age or living in remote regions. Both objectives can be achieved by tying TA-funded consultancy to Bank-funded projects.

Executive Summary



Our CoOs continue to experience disparities in the provision of telecommunications and technology services, which are deemed essential for achieving transition as well as sustainable development goals. Technological progress is changing not only the way we communicate, but affects most, if not all, traditional sectors from finance to health care, from agriculture to manufacturing. Furthermore, future investments in the sector need to be shaped to mitigate the impacts of climate change.

Developing, adopting and adapting technology can improve productivity, increase efficiency, lower costs, and correct information asymmetries in all sectors. **Digital divides** between and within countries hold back important social and economic developments. The **energy efficient** upgrade of networks is crucial to create sustainable ICT infrastructure. Investment categories include:

- I. Infrastructure Investment rapid data growth requires continuous investment in telecoms infrastructure, including broadband and satellite communications, to provide increasing speed, reliability, coverage and access.
- II. New Technologies investments in early stage, high growth, technology focused companies, which introduce new and innovative applications that bring the benefits of technology to consumers and businesses.
- III. IT Services investments in more established technology companies, often asset light companies, such as IT services companies and software developers, will provide further financing opportunities for the Bank.
- IV. Privatisation and Commercialisation supporting governments in privatisation, preprivatisation and commercialisation, designing programmes for state-intervention in areas of market failure and adopting and implementing a legal and regulatory environment promoting liberalisation and competition.

Investments **will meet key challenges**: supporting ICT readiness, providing capital to IT services and early stage companies, supporting green transition, narrowing digital divides and responding to policy, regulatory and governance challenges. Transition Impact will mainly relate to the **competitive** quality by supporting innovative companies and traditional telecommunication companies providing access to ICT services. By addressing digital

divides and supporting the development of adequate skills of the workforce, investments will help support **economic inclusion** among women and youth as well as **regional integration**. Furthermore, energy efficient capex roll-outs and upgrades will support the **green** quality, while the **well-governed** and **resilient** quality may be applicable to privatisations, capital market transactions and e-government services.

The Bank will deploy a **full range of debt and equity** products, including capex financing, M&A and capital markets transactions, and will seek to further expand its successful VCIP platform. Co-operation with IFIs and EU funding mechanisms will be increased.

Investments will be linked to **Policy Dialogue**, where appropriate, to improve the policy, regulatory and governance environment as well as market structures in the ICT sector and to support governments in addressing the challenges associated with new technologies such as cyber security, data protection and digital divides.

Additionality will come from (i) large amounts and long tenors required for infrastructure investments (ii) developing the local VC ecosystem through financing and expertise (iii) provision of financing for asset light IT services companies (iv) commercialisation and privatisation financing and associated TA support. In addition to appropriate TA-support, the Bank will mobilise third party financing where appropriate and possible.

Network Infrastructure Network Upgrades Supporting Network Infrastructure Network Expansion ICT Readiness Network Infrastructure Data Centres, Towers, Outsourcing, JVs Providing Capital to IT Services and New Tech Access to VC Finance Innovative & Advanced Technology Companies Supporting Green Energy Transition Innovative & Advanced IT Services Access to VC Finance Closing the Digital Divide Privatisation Investment Mature IT Services Responding to Regulatory	2014-2018 Strategy		Investment Categories I - IV	Key Challenges			
Network Infrastructure New Infrastructure Providing Capital to IT Data Centres, Towers, Outsourcing, JVs Providing Capital to IT Access to VC Finance Innovative & Advanced Innovative & Advanced Access to VC Finance Innovative & Advanced Access to VC Finance Privatisation Investment Mature IT Services			Network Upgrades Network Expansion (Broadband)		Supporting ICT Readiness		
Access to VC Finance Innovative & Advanced Supporting Green Energy Innovative & Advanced Access to VC Finance Closing IT Services Mature IT Services Closing Privatisation Investment Mature IT Services Responding to Regulatory	Network Infrastructure	NEW S	New Infrastructure Data Centres, Towers, Outsourcing, JVs		Providing Capital to IT Services and New Tech		
Innovative & Advanced IT Services Fi Access to VC Finance Closing the Digital Divide Privatisation Investment Mature IT Services Responding to Regulatory	Access to VC Finance	TRATEGY	TRATEGY	Innovative & Advanced Technology Companies		Supporting Green Energy Transition	
Privatisation Investment Mature IT Services Responding to Regulatory	Innovative & Advanced IT Services			EGY	Access to VC Finance		Closing
Responding to Regulatory	Privatisation Investment		Mature IT Services		the Digital Divide		
Pre-Privatisation & Challenges			Pre-Privatisation & Privatisation Investment		Responding to Regulatory Challenges		

Scope and Structure of the ICT Sector Strategy



Key aspects of the new strategy for Information and Communication Technologies are summarised below:

- Investment Categories: to include network infrastructure, new technology and early stage innovative companies, IT services, privatisation and commercialisation;
- Key Trends: include cross sectoral digital disruption, rapid data growth, increasing energy usage, the emergence of digital divides, increased globalisation and outsourcing.
- Key Challenges: ensuring ICT readiness, supporting access to finance for IT Services and new technology companies, improving energy efficiency, narrowing digital divides, improving the regulatory environment.
- New Themes: adapting traditional approaches based on past experience, deeper cross sectoral collaboration within the Bank, focus on new technologies, focus on green technologies and energy efficiency.

The **Strategy interfaces** with other Bank strategies, policies and initiatives, including:

- Sector Strategies and Cross-Sectoral Collaboration (Annex 1),
- Country Strategies,
- The Knowledge Economy Initiative (KEI),
- Venture Capital Investment Programme (VCIP),
- Green Economy Transition Approach,
- Smart Cities Initiatives,
- The Strategy for Promotion of Gender Equality and the Economic Inclusion Strategy,
- LC2, SBI Initiatives.

The Strategy is also aligned with National and Supra-national Digital Agendas. The Bank will increase its co-operation with other IFIs and seek to leverage additional sources of funding such as the EU (Annex VI)

SECTION 1. Implementation of previous Strategy:

- Overview of previous strategy
- Achievements
- Operational Challenges.



SECTION 2. Sector Context and Transition Challenges:

- Industry Trends
- Industry & Transition Challenges

SECTION 3. Proposed strategic directions and activities:

- Evolving ICT Strategy
- The Bank's Approach to ICT Sector
- Focus by Theme and Region

SECTION 4. Positioning EBRD vis-à-vis other IFIs and partners:

- Donor Funding
- Partnering with IFIs
- IFI activities in CoOs

SECTION 5. Measuring the new ICT Sector Strategy:

- Monitoring Framework by Theme



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1. Implementation of Previous Strategy 2014-2018

1.1 Overview of the previous strategy



The challenge in the previous Strategy was to deliver **competitive** and **innovative** access to ICT infrastructure and services based around **three investment pillars**:



PILLAR I. Privatisation support & investment at pre-privatisation stage and at privatisation stage support with Policy Engagement, TA and finance. PILLAR II. Network infrastructure

including investments in fixed, mobile, towers, data centres, satellite services, media e.g. pay-TV. PILLAR III. Innovative & Advanced IT Services IT products, systems & services companies; Internet platforms, E-Commerce & New Technology (smart innovative technologies). **Knowledge Economy Initiative** (KEI) - the majority of ICT projects and TC fall within the **KEI** (BDS14-053) approved on 12th March 2014. The four pillars of the KEI are:

- Investment in ICT infrastructure.
- **Technology Upgrades** targeting new technology, R&D, training and skills.
- Venture Capital Investment and Support early and growth stage innovative tech companies through VCIP (est. 2012).
- Policy Engagement targeting regulatory reform, business climate and roadblocks, with a particular focus on:
 - Working with authorities on appropriate regulatory and legal regimes promoting competition, innovation and affordability, whilst recognising the significant capital investments required for the sector,
 - TC-funded support for strategically important national and regional initiatives, such as Accelerated Broadband Connectivity (ABC),
 - TC-funded Support Pre- and At-Privatisation and for Digital Switch-Over (DSO).



1.2 Snapshot of activities during previous strategy period





1) 54% of operations were in equity. There is a technology cycle of 5-6 years, resulting in a lumpy and cyclical ABI evolution. The 5G technology cycle is expected to begin in the next years. VCIP typically does a large number of small deals. Increase in operations in 2015 was due to a high number of mobilised investments. 2) VCIP operations also include e-commerce projects such as KupiVIP and Trendyol.

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1.3 Operational Highlights



Total Invested: EUR 1.1 billion invested in 56 operations in 19 countries, KEI: €888m (80% of ABI) and 48 operations (86% of Operations).

Debt: (EUR 921 million) mainly in (i) large mobile and fixed infrastructure build-outs, e.g. OTE, Turk Telekom and Cyfrowy Polsat; (ii) New technology companies e.g. Pronet (Smart Security), Vermeg (Software for financials), and Allegro (e-commerce).

Equity: 54% of operations (EUR 188 million) were in equity. These were mainly in (i) VCIP – financing of early stage companies: €49m in 14 operations (22 investment projects including follow-on investments); (ii) integrated telco operators e.g. Digi Communications and United Group; (iii) ecommerce companies such as Allegro and Hepsiburada.

Policy Engagement and Technical Assistance included the Accelerating Broadband Connectivity (ABC) Initiative, a platform linking EBRD's policy engagement, technical assistance and investment activities, as well as activities ranging from advice on policy, drafting/amendment of laws/regulations, capacity building to financial & technical modelling in Armenia, Azerbaijan, Bosnia, Cyprus, Georgia, Greece, Kosovo, Moldova, Serbia, Tunisia, Ukraine, Uzbekistan.

1.4 Representative ICT Projects by Country – 54% of Transactions represented by Equity Investments





1.5 Key Lessons from Implementation



Tł	ne lessons learned from the 56 projects between 2014-20	018 shape the new 2019-2024 ICT Strategy:		
	2014-2018 Project Experience	EBRD Lessons Learned		Implications for the 2019 Strategy
	 20 incumbents[*] in the CoOs are state-controlled. Efforts to privatise several incumbents have been cancelled. Regulatory Framework may not be suitable to provide competitive safeguards. 	 In addition to privatisation support, the EBRD needs to be involved in the commercialisation and pre- privatisation of SOEs combined with policy dialogue to support the implementation of competitive policies. 	1	 Seek early involvement in commercialisation and pre- privatization support, working with regulators to ensure fa competition, reduce ability to abuse dominant position and to increase capacity and effectiveness of regulators.
	 Several prominent operators have reputational issues preventing the Bank from working with them. 	 Prospective clients need to be monitored and undergo external due diligence in case of potential issues. 	2	 Continue monitoring; investment in such companies requires an acceptable change of control.
	 The early stage finance ecosystem is in a formative stage. The region lacks local ICT champions and experience. This is slowly changing. 	 EBRD needs to provide support to local entrepreneurs who require financial investments as well as assistance from internal and external experts. 	3	 Support entrepreneurial ventures in the tech sector with VCIP, allocate third party incentives and support e.g. EU's EFSD guarantee, Star Ventures (ASB).
	 Capital market transactions arise on an ad hoc basis and can be cancelled or significantly postponed without notice. 	 EBRD's involvement in IPOs and bond issues is crucial, particularly where there is market volatility. In addition, adaptation to fast moving timelines is crucial. 	4	 Support both debt and equity capital market transactions as they arise, including local currency denominated bonds
	 The digital revolution is increasingly cross- sectoral, affecting a wide range of sectors and activities. 	 Technology acts as a cross sector enabler of growth and development and therefore cross-sector collaboration within EBRD will be increasingly necessary. 	5	 Work on a cross-sector basis to address the strategic needs/enablers of its clients (e.g. Smart cities, FinTech). VCIP will address early stage investment across sectors.
	 High transition impact can be difficult to demonstrate in the ICT sector in more developed countries where basic ICT infrastructure is already present. 	 Transition arises from technological upgrades and network expansion, enabling innovative services. Telecom operators are keen to invest in energy efficient capex. ICT services providers are interested in Equal Opportunities programmes supporting inclusive work environments and skills enhancement opportunities for women, youth and people with disabilities. 	6	 Focus on e.g. fixed/mobile broadband, innovative services (competitive), broadband to underserved regions (integrated), GET capex (green), equal opportunities policies, training and life-long learning (inclusive), corporate governance (well-governed), network and IT modernisation / innovative financial instruments (resilient)







2.1 Global industry trends and key challenges - overview



MAJOR GLOBAL TRENDS SHAPING ALL SUB-SECTORS OF ICT

WIDENING OF DIGITAL DIVIDES

CLIMATE CHANGE



KEY INDUSTRY CHALLENGES IN THE EBRD REGION

To ensure the **readiness** of the ICT sector to adapt and benefit from progress

To enhance **access to finance** for IT service and new technology companies

To introduce **energy efficient** technologies and upgrade ICT infrastructure

To narrow **regional and social gaps** in access to ICT services and skills

To improve the **policy**, **regulatory and governance environment** and market structures in the ICT sector



I. TREND: NEW & DISRUPTIVE TECHNOLOGIES

- The technology revolution is rapidly disrupting all sectors, in a self-reinforcing cycle of technological innovation, data growth and advancing communications infrastructure.
- The ICT sector functions as a strategic key enabler, transforming value chains across sectors and altering the way people work and live (see graph), e.g. digitalisation of finance, education and manufacturing.
- Key developments of this trend include:
 - Ground-breaking Innovations, such as cloud computing, internet of things (IoT), artificial intelligence (AI), Big Data analytics and distributed ledger technology (e.g. Blockchain) are driving digital transformation across all sectors.
 - Digitalisation & Automation: Increased use of digital technologies, including machine learning and robots, has implications for work and skills across all sectors. This underlines the need for upskilling of the workforce as well as the transition away from traditional labour force models.
 - Governments are increasingly digitalising public sector services and introducing e-government platforms, e.g. digital IDs, digital market places and national action plans.
- Implications include disrupted business models, disintermediation, new entrants and a need for existing players to adapt or risk obsolescence.
- Increased cross-sector collaboration is crucial to respond to these developments. New technologies can support the closer integration of services such as telecoms and banking or utilities technologies and, ultimately, wideranging and complex initiatives such as Smart Cities.



Note: EBRD has invested in several companies, which bring new technologies to traditional sectors, such as Education (VCIP Explain Everything), Retail (Hepsiburada, VCIP Trendyol), Mobility (VCIP Trafi, VCIP GoOpti), Healthcare (VCIP DocPlanner) and Security (Pronet). VCIP is an important tool for equity investment into SMEs in early transition countries as well as other CoOs.

2.2 Global industry trends 2/3

II. TREND: RAPID DATA GROWTH

Data traffic grew at a CAGR of 30% between 2012 and 2017. By 2022, there will be 12 times more mobile traffic in Central & Eastern Europe and Middle East & Africa than today³. At the same time, demand for faster download and upload speed is increasing. Key consequences:

- Significant investments for upgrading infrastructure are necessary to fulfil the fast growing data demands of tomorrow.
- High-speed and large data 5G networks are challenging fixed broadband providers, triggering further fixed-to-mobile substitution. On the other hand, as fixed broadband remains the crucial backbone for 5G, market consolidation is expected to increase.
- **Data Centres** have become essential ICT infrastructure due to the growth in data usage and the move to online applications and cloud computing.
- **Micro-satellite constellations** are emerging which will offer a cost effective solution to global connectivity, particularly outside urban centres.
- **Government intervention** (e.g. anti-trust, data protection, privacy, ethical use of data) becomes crucial in responding to increasing digitalisation and the influence of major internet companies.
- Cyber Security is becoming critically important to ensure the protection of sensitive data.

III. TREND: CLIMATE CHANGE AND SUSTAINABILITY

Combatting climate change requires 'greening' of the ICT infrastructure, and the 'greening' of other sectors through the development, adopting or adapting of new technologies:

- Data growth is causing drastic increases in electricity consumption : the global ICT sector (excl. production of devices) accounts for 2.5-4.5% of global electricity consumption (expected 11% by 2030) and 2.2% of global CO2 emissions (on a par with the aviation sector)⁵. Large tech companies are responding by optimising their energy consumption: eBay achieved an 85% reduction in energy consumption through system design adjustments without the need to upgrade any servers.
- Climate Smart ICT: New technologies will support most sectors' response to climate change. According to the International Energy Agency, digital technologies are set to make energy systems around the world more connected, intelligent, efficient, reliable and sustainable⁶. For example, public transportation systems can be made more efficient through better supply demand management as well as by making the transportation vehicles themselves more energy efficient.
- Circular Economy: Resource efficiency, re-use and the management of electronic waste are increasingly important challenges.

3) Source: Ericsson. 4) Source: Arthur D. Little analysis, Alcatel, Cablelabs, equipment vendors, ITU. 5) Energata. <u>https://www.enerdata.net/publications/executive-briefing/world-energy-consumption-from-digitalization.pdf</u> 6) Source: IEA: Digitalization: A new era in energy? <u>https://www.iea.org/digital/</u>.





2.2 Global industry trends 3/3

IV. TREND: WIDENING OF DIGITAL DIVIDES

- Between 2013-2016, five economies (China, Chinese Taipei, Japan, Korea and the US) were responsible for developing between 70% and 100% of the top 25 cutting-edge digital technologies⁷. This shows the increase in inequality between countries resulting from the digital revolution. The graph to the right shows that internet connectivity rates vary considerably across the world. Varying demographics and cultural norms may require a different approach in different CoOs.
- Digital gaps are also increasing within countries: the latest communication technologies, such as 4G and 5G, tend to be rolled out primarily in urban areas. Companies are adopting new business models which enable them to invest in remote regions: Operators are trying to increase mobile coverage with infrastructure sharing models, which can allow a reduction of investment costs by as much as 50-70%⁸. Small independent companies benefit from such models.
- Collaborations with tech start-ups enable operators to supplement and enhance their products with additional services such as e-banking, e-government services, and others, reaching people in remote regions with a wide range of services.
- In addition, governments and international organisations, such as the EU, increasingly focus on creating incentives for broadband development in under- and unserved regions.

V. TREND: GLOBALISATION AND OUTSOURCING

- Globalisation is enabling outsourcing of IT services to specialised domestic and foreign IT companies. According to a Global Industry Analytics report, the global Business
 Outsourcing market is expected to reach USD 220 billion by 2020, which compares to USD 24.6 billion in 2017⁹.
- The increasing cost and complexity of new technologies as well as regulatory requirements (e.g. GDPR) are driving the demand for outsourcing.
- While China and India were the leading outsourcing countries in 2017, with about USD 150 billion in IT exports⁹, increasing competition is expected from several countries in Eastern and Central Europe, such as Ukraine, Poland, Romania and Belarus.
- The change in contract models in the outsourcing industry will increase the demand for co-working spaces, which offer IT infrastructure and support to freelancers in the outsourcing industry as well as new technology start-ups, thereby reducing their upfront investment needs.





Proportion of Households with Internet Access by region, 2017⁸



2.3 Key industry challenges in the EBRD region: Readiness of the ICT Sector 1/2



The ICT sector in the EBRD CoOs shows limited readiness which is crucial for adapting to technology changes and benefit from progress

Technological developments can be disruptive by **challenging business models** and **legal and regulatory frameworks** across a large range of sectors. In order to face the challenges posed by disruptive innovation and benefit from these technological advancements, countries require an ICT sector that demonstrates strength and adaptability in terms of infrastructure, skills available in the market, regulatory framework and financing. **EBRD's countries of operations are lagging behind** market leaders in terms of the "readiness" of the ICT sector, that in turn may explain the limited availability of latest technologies, both through lack of technological transfer and limited innovation.



EBRD's CoOs still lag behind the more advanced comparator countries in terms of readiness. The **"readiness" index** measures the extent to which economies enable the uptake of ICTs, especially thanks to the ICT infrastructure, accessibility and affordability of ICTs, as well as the skills needed to make use and benefit from ICTs. This correlates with the availability of latest technologies.

Change in number of robots per 1,000 manufacturing workers, 1993-2016¹¹



Despite the rapidly growing usage of new technologies globally, in the EBRD region the uptake and usage of new technologies happens at a slow pace. For instance, many EBRD's CoOs are falling behind more advanced countries in terms of the **observed change** in the number of robots per 1000 workers over the period 1993-2016.

10) Source: World Economic Forum, Networked Readiness Index historical data; Comparator countries are Canada, Czech Republic, France, Germany, Japan, United Kingdom, United States and Sweden. 11) Source: FR and ILO, EBRD's calculations from the EBRD's Transition Report 2018-2019.

2.3 Key industry challenges in the EBRD region: Readiness of the ICT Sector 2/2



The ICT sector in the EBRD CoOs shows limited readiness which is crucial for adapting to technology changes and benefit from progress

Stronger readiness of the ICT sector and more uptake of new technologies in the EBRD's CoOs are hampered by the following challenges: (i) **substantial investment** is required to expand high speed, reliable broadband access technologies across CoOs, to help enable access to technological innovation, (ii) the ecosystem for financing **innovative early-stage companies** is underdeveloped, with few local, experienced professionals able to manage the growth of such companies or provide the necessary training and learning opportunities, (iii) later stage innovative enterprises and companies transforming their business models by adopting new technology, require **investment to keep them competitive**, (iv) CoOs, particularly outside the EU, may not have a **suitable environment, institutional capacity and skills** to take advantage of disruptive technologies and deal with their social effects, (v) **reliability of international connections** is still an issue in some parts of the region, and should be addressed through international backbone projects.

EBRD Knowledge Economy Index, 2011 vs. 2018¹²



As it becomes visible from the EBRD Knowledge Economy Index, the EBRD countries' **"knowledge economy" is still weak** compared to the 8 advanced OECD comparators in all its main dimensions: institutions that favour innovative activities, skills required to innovate available in the market, the strength of the innovation eco-system, as well as the spread and sophistication of the ICT infrastructure.

EBRD ICT Infrastructure Pillar, 201813



The **ICT Infrastructure** pillar of the EBRD Knowledge Economy Index measures the availability and sophistication of the ICT infrastructure. To varying degrees, all the EBRD economies have encountered difficulties in developing an infrastructure with wide geographical and demographic penetration and adaptive to technological progress, although the biggest challenges are faced by some countries in Central Asia and SEMED.

2.3 Key industry challenges in the EBRD region: Capital availability for asset light companies

Access to finance in the EBRD region remains a challenge especially for asset-light IT services and new technology companies

One global trend faced by IT services companies is an increase in IT outsourcing which tends to **benefit low income countries**, including the EBRD's CoOs. These countries have seen an **increase in ICT services exports** as % of total services exports in recent years. This untapped potential in the IT services sector is challenged by the companies' difficulties in raising finance because of their **asset-light nature** (also referred to as "people businesses"), while at the same time facing long project cycles (e.g. digitalisation projects). **New technology companies** also face similar constraints related to the availability of capital because of the early-stage of the VC market in the EBRD's CoOs. In particular, this is due to the lack of and limitations of (i) specialist VC finance, (ii) experienced VC investors and (iii) local entrepreneurial environment.

ICT services exports (% of service exports), 2017¹⁴

(only EBRD countries with value > 5% are shown.)



In many EBRD countries the share of **ICT services exports** in overall service exports is significant, with some CoOs comparing well against other comparators. Among the EBRD countries who have benefited the most from the increasing international sourcing of ICT services there are Ukraine, Romania, and Belarus, among others. Nevertheless, if compared to India, they still have an untapped ICT services export potential.

Venture Capital Availability, 2012 and 2016¹⁵



Access to VC financing is necessary for highly innovative nascent businesses where fixed assets are scarce. **Availability of VC** represents a challenge in all the EBRD regions, if compared to a set of more advanced comparators. While in some regions (e.g. Central Asia) there has been a visible improvement, in most of the other regions the market shows limited developments.

14) Source: The World Bank. https://data.worldbank.org/indicator/BX.GSR.CCIS.ZS 15) Source: World Economic Forums, Networked Readiness Index, historical data. Comparators: Japan, United States, Singapore and Sweden.

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2.3 Key industry challenges in the EBRD region: Energy Efficiency and Climate Change

In the EBRD CoOs improvements in energy efficiency of the ICT sector are constrained by the outdated infrastructure and technologies

With digital energy consumption growing annually by 10%, the ICT sector (excl. device production) may account for 11% of electricity consumption by 2030 and 4.5% of GHG emissions by 2025¹⁶. While developed countries are moving towards more energy efficient technologies for their telecommunication infrastructure, the EBRD's CoOs still mostly rely on copper telephone lines, with higher levels of energy consumption per data volume. Fibre optic (FTTH/B), which is still not the dominant technology used in the Bank's CoOs, consumes 40% less energy per Mbps than ADSL (transmission over copper lines). Greening of telecom infrastructure and technologies in the EBRD's CoOs is therefore crucial to combat climate change. Other industries are facing similar challenges and are relying on greening by new and innovative technologies to manage and reduce energy consumption and CO2 emissions. Especially investments by energy companies in the digitalisation of networks is necessary to achieve savings, which could reach about 5% of total annual power generation costs worldwide¹⁷.

Electricity use by internet data transmission networks¹⁷



BUILDINGS Autonomous cars/trucks RANSPOR High energy Smart lobility as Magnitude of potential change to demand thermostats a Service User programming Occupancy sensors manufacturing Beyond the Accelerating plant fence innovation in industry Optimised process Daylight Inmanned sensors shipping

Remote

contro

Drone

delivery

High

With the increasing use of smart phones, mobile networks account for around two-thirds of the total energy use by internet data transmission networks. Electricity consumption from data networks could increase by 70% with only moderate efficiency improvements, but could fall by 15% with high rate efficiency improvements, assuming same increase in data.

ICT can reduce greenhouse gas emissions by 20% by 2030¹⁸ by providing new technology solutions to companies and consumers: the aviation industry uses a large amount of sensors as well as big data analytics to optimise route planning and reduce fuel use. Automated, connected, electric and shared (ACES) mobility will contribute significantly to the reduction in future energy consumption and CO2 emissions.

Barriers to digitaliation

Industrial

MO.

1 ow

Big data in

aviation

16) Source: The Shift Project: https://theshiftproject.org/wp-content/uploads/2019/03/Lean-ICT-Report. The-Shift-Project_2019.pdf 17) Source: Source: IEA: Digitalization: A new era in energy? https://www.iea.org/digital/18) Source: UNFCCC: ICT Helping Tackle Climate Change Could Help Cut Global Emissions 20% by 2030.





2.3 Key industry challenges in the EBRD region: Digital Divides

Geographical and social divides in connectivity and digital skills are significant within EBRD CoOs

Digital divides within the Bank's CoOs continue to exist. Affordable, reliable and fast internet access for everyone is a fundamental requirement in modern economies. Operators and investors are often reluctant to invest in under-served regions, where broadband expansion tends to be less cost effective, leading to significantly lower access to internet in rural areas compared to urban regions in the EBRD CoOs. The digital divide is also apparent when comparing ICT skills by different demographic groups. In most EBRD countries men tend to be more likely than women to possess ICT-specific skills, thus explaining the larger male participation in the sector. Furthermore, technological innovation and the digitalisation of industries can be associated with social and economic challenges for parts of society which may lack access to such technologies or the relevant skills.



In EBRD's Countries of Operations the gap for access to internet between urban centres and rural regions is considerably larger than that in the advanced comparators. Regions such as Central Asia, Eastern Europe and the Caucasus as well as SEMED are especially facing large differences in internet access across regions.

20% 15% 10% 5% 0% -5% Hungary Lithuania Georgia Latvia Slovakia Slovenia Romania Turkey Croatia Estonia Poland Sweden Serbia Montenegro Cyprus Comparators Kazakhstar Bulgari -10% -15%

Note: Standard skills correspond to using Excel and PowerPoint, installing devices, etc. A positive difference indicates a larger proportion of men having a skill.

The gap between men and women related to basic skills, e.g. writing emails, is less significant in the EBRD's CoOs. However, when looking at standard skills, the gaps become more apparent. It has to be noted that in countries where the differences are less significant, the overall skill level tends to be low compared to OECD countries.



Differences in proportion of men and women with standard ICT skills, 2017²⁰



2.3 Key industry challenges in the EBRD region: The Regulatory Challenge

Market structure and regulatory situation remains challenging for operators in the EBRD region

The regulatory frameworks in the telecommunication sector of many of the Bank's CoOs (particularly outside the EU) are lacking crucial features such as an independent regulator or other competitive safeguards compared to more developed markets. **Regulatory measures** (such as local loop unbundling, duct access, interconnection fees, number portability and infrastructure sharing) as well as **regulatory capacity** and enforcement can be critical factors in ensuring a fairer market. Alternative telecommunication companies (Altnets), which may not have their own infrastructure, depend on the regulator to set reasonable rules for access and can face considerable challenges particularly where the **incumbent has significant market power** and/or remains state owned. This can have a direct impact on the **availability and affordability of telecommunication services** in the Bank's CoOs.



■ ITU Overall Regulatory Score (2017) ◆ Mobile broadband, postpaid as % of GNI p.c. (2017)

The ITU's Regulatory Score measures the regulatory environment based on the functioning of the regulator, the targets and reach of regulations, as well as the level of competition in the main market segments. A low score is **often associated with higher pricing of telecommunications services** (e.g. mobile internet), as regulations supporting competition are either not implemented or not enforced. This is especially visible in Central Asia.

Market shares across EBRD CoOs of state controlled operators²² (state ownership > 50%)



<u>Note</u>: Market shares have been assessed for both fixed and mobile telecom segment, with the market share where the SOE is dominant reflected in the chart.

Several CoOs retain ownership/control over an incumbent operator. In fourteen of EBRD's CoOs, the SOE market share is above 50% in either the mobile or fixed market. In many cases and where insufficient regulation is in place, this implies that the state maintains a dominant position over telecommunication backbone infrastructure.

21) Source: ITU's ICT Regulatory Tracker (2017), ITU's Measuring the information Society Report (Volume 1). Comparators are Italy, Ireland and Switzerland. 22) Source: Data for SOEs collected from various data sources (BMI and EIU).

European Bank for Reconstruction and Developm

2.3 Key transition challenges²³



Competitive	Competition: private sector participation is still limited in many countries, especially in the fixed segments. Entry of new players requires substantial improvements in the regulatory environment, introducing competitive safeguards and addressing issues of competitive neutrality. Commercialisation and privatisation of state-owned incumbents remain problematic in many CoOs. Innovation: The innovation eco-system is still weak in many CoOs compared to frontier countries. Closing the gap require stronger institutions, as well as adequate investments in infrastructure and skills and can support start-ups and SMEs across the CoOs.
Well-Governed	State-owned enterprises in the ICT sector need substantial improvements in corporate governance, as part of a commercialisation strategy that can accelerate the process towards successful privatisation. Furthermore, companies in the ICT services sector are often SMEs in need of corporate governance improvements to unlock their high growth potential and facilitate their IPO or acquisition by strategic investors.
Resilient	Access to finance: long-term financing required for broadband expansion in remote regions is limited in CoOs. Local capital markets are still weak in many COOs, as evidenced by limited major corporate bond issuances (including local currency) or sizable corporate IPOs. Limited availability of VC/alternative financing echo-systems hinders the development of innovative start-ups , SMEs and other ICT companies.
	Reliability of internet connection is still an issue in some parts of the region, and should be addressed through international backbone projects.
Integrated	Affordable access to modern broadband internet services is essential for regional economic integration. This remains a challenge in much of the EBRD region, with a significant digital divide between the major urban areas and more remote rural regions. Further investments in broadband internet rollout are thus needed to close this gap. Further strengthening of the export capabilities in the ICT services sector are needed to leverage the potential positive impact of the sector on wider economy.
Inclusive	Access to ICT services for all individuals – regardless of their gender, age or what part of the country they live in – is crucial for ensuring access to economic opportunity and for combatting economic and social exclusion. Given that occupations in most sectors tend to be male-dominated, women's low participation in the workforce remains a key obstacle for many EBRD countries of operations to be addressed through dedicated initiatives. Many business actors lack the motivation or know-how to invest in ICT-related training and skills that can improve their business performance, productivity and technological adaptation. Countries facing demographic changes related to their labour markets face additional challenges that can be moderated through life-long take-up of ICT skills.
Green	Investments are needed to ensure the highest levels of energy efficiency and increased climate resilience and to minimize any potential impact on the environment in general. Additional focus is needed on the supply of electricity for the ICT infrastructure, i.e. assess carbon intensity of power generation and the electricity grid in general and how to address opportunities. By updating fixed and mobile networks to latest energy efficient technologies , telecom operators can reduce primary energy consumption and CO2 emissions significantly. Upgrades should also improve the climate resilience of ICT infrastructure, e.g. to floods and other extreme weather events. In past projects, ICT in cooperation with E2C2 identified between 30 and 50% of the financed capex as so-called "green capex".



187. 645.05 210.95 12,411.80 149.16 207.70 \bowtie 210.95 41% 207.70 3. The Bank's Approach in the ICT Sector

3. The Bank's Approach in the ICT Sector

3.1 EBRD's evolving ICT sector focus



Whilst continuing to address challenges faced by traditional network infrastructure, privatisation and IT related projects, ICT will also focus on early stage equity investment across all sectors and CoOs. The Bank will build on its KEI and VCIP experience to address cross-sector opportunities and support companies in developing, adopting and adapting innovative technologies.

ICT Strategy Focus Areas in 2014*	Key Global Trends		ICT Strategy Focus Areas in 2020-2024*	Targeting of Transition Challenges
	Disruption of all soutors by no	I	Network Upgrades Network Expansion (Broadband) New Infrastructure	By investing in the energy efficient upgrade and roll-out of ICT infrastructure, the Bank will support the readiness of the ICT infrastructure in the Bank's CoOs and target the green energy efficiency challenge . The financing of remote regions will support the
Network Infrastructure	technologies	w	Data Centres, Towers, Outsourcing,	closing of the digital divide.
	Data Growth	Data Growth Innovative & Advanced Technology Companies	The Bank will support the development of new and disruptive technologies by providing access to capital to early stage and mature technology related companies.	
Access to VC Finance	outsourcing		Access to VC Finance	Investment in asset light IT Services
	Widening of Digital Divides			companies will facilitate access to finance and support digitalisation. Investments may be linked to digital skill development.
Innovative & Advanced IT Services	Climate Change	111	Mature IT Services companies	Investments in SOEs will be linked to policy
Privatisation Investment		IV	Pre-Privatisation & Privatisation	dialogue targeting the implementation of competitive safeguards which supports the development of the sector.
				Equity operations will continue to constitute

* box size is *indicative* of the EBRD's past and planned engagement (# of operations) in a particular focus area

Equity operations will continue to constitute a significant percentage of projects financed by the Bank in the ICT Sector.

3. The Bank's Approach in the ICT Sector

3.2 Facilitating the transition to a market-based and innovative ICT sector



The Bank will support innovation and the bridging of the digital divide by promoting access to and the development of competitive and/or innovative ICT infrastructure, products and services. The Bank's activities in the ICT sector will reflect broader cross-sector approaches and initiatives (e.g. EBRD's Knowledge Economy Initiative and VCIP) to help CoOs meet their ICT objectives, including their respective national digital agendas.

Interrelated focus area individual countr	s that will be tailored to y characteristics	Instruments	Investment Types	Cross Sector Support	EBRD's value added		
Network Upgrades Network Expansion (Broadband) New Infrastructure Data Centres, Towers, Outsourcing, JVs	 Fixed & mobile networks Broadband and IoT networks Pay-TV, digital switchover Data centres Satellites Tower & Public infrastructure 	Debt, Equity, Credit line for local SME finance, IPPF/PPP Structures 3 rd party guarantees (e.g. EU)	Full range of transactions including: • Capex financing	edit ME PPP Itees • Capex financing • Capex financing • Capex financing • Capex financing • Capex financing • TA support – work with E2C2, Inclusion - where appropriate, including: identification, preparati feasibility; legal and reg frameworks for ICT; pre national digital plans, s privatisations and		 Infrastructure Large investments amounts Long tenors Mobilisation PE and TA Support 	
Innovative & Advanced Technology Companies Access to VC Finance	 E-commerce E-tech (e.g. fintech, healthtech, edutech, e- gov), AI, Big Data, Smart City and other disruptive technologies 	Debt, Equity, including early stage investment, VCIP Credit line for local SME finance 3 rd party guarantees	Debt, Equity, including early stage investment, VCIP Credit line for local SME finance 3 rd party guarantees	 Mergers and acquisitions Debt and equity capital markets credit lines to local partner banks with a full range of potential clients including: 	 Mergers and acquisitions Debt and equity capital markets credit lines to local partner banks with a full range of potential clients including: 	commercialisation, heiping governments in managing challenges associated with new technologies Cross-Sector support – FI (e.g. FinTech, payments), P&T (DCs, IT Parks, smart buildings)	 New Technology Ecosystem VC Equity investment Mobilisation In-house and external VC expertise PE and TA support
Mature IT Services companies	 IT services, including IT integration and cloud computing 	3rd party guarantees (e.g. EU)	partner banks with a full range of potential clients including:			partner banks with aMunicipalities (Smartfull range ofP&E (electrical grid, topotential clientsdistribution), M&S (auincluding:tech upgrades), Trans	Municipalities (Smart Cities), P&E (electrical grid, tower distribution), M&S (automation, tech upgrades), Transport (traffic
Pre-Privatisation & Privatisation Investment	 Pre-, at and post privatisation support and investment 	Debt, Equity	incumbents, altnets, SMEs	management. autonomous transport), Agribusiness (Agritech), Equity Funds (ICT funds). SBI (small business), LC2 (local currency and capital markets)	 Privatisation Commercialisation, pre- and at- privatisation investment PE and TA Support EBRD as neutral stakeholder Corporate Governance improvements 		

3.3 Focus areas, potential TI, types of investment & possible Policy Engagement / TA



Focus Area I: Infrastructure - Support investment in the roll-out and enhancement of ICT infrastructure

There is a constant need to upgrade communications infrastructure to meet the speed, functionality and capacity requirements needed for the exponential growth of data driven by significant increases in demand. The Bank will therefore focus on:

1. Improved quality of infrastructure, including:

- Roll out and enhancement of ICT infrastructure, whether fixed or mobile, including for incumbents, new entrants and altnets, state-led national broadband networks, cable TV, IPTV, satellites and other ICT network operators.
- Infrastructure sharing and IT Outsourcing, e.g. tower companies, data centres, business process outsourcing.
- 2. Improved rural, regional and international connectivity through technology infrastructure and increased access to skills development opportunities (thereby helping to reduce the digital divide), including
 - Broadband enhancement and expansion to underserved regions
 - Increased international connectivity networks incl. sub-sea cable
- 3. Supported, where appropriate, by Policy Engagement and TA, including
 - Reviewing sector policy, legal and regulatory areas
 - Enhancing regulatory and ministerial capacity regarding national and global challenges including data protection and cyber security
 - Project identification, preparation and feasibility
 - ABC Initiative TA-funded initiative for Accelerating Broadband Connectivity - including target setting, preparation of national digital agendas, technical and financial modelling, implementation, planning and piloting.
 - Mapping opportunities for sustainable investments
 - Skill development initiatives

EBRD's Transition Impact:

- Support ICT Readiness: The Bank's Knowledge Economy Initiative aims at developing access to information via the availability of broadband, fixed and mobile, to reduce the digital divide within countries and across the region. Under the Initiative, companies can get access to TC support related to Due Diligence, Policy Dialogue as well as the identification of technological trends. Furthermore, the Bank will provide finance to Altnets to enable them to accelerate infrastructure roll-out and upgrades, as well as for M&A transactions to help build critical mass.
- Close the digital divide: By investing in broadband roll-outs to underserved areas and enabling the expansion of broadband mobile coverage where fixed network rollout may be less feasible, EBRD can support countries to reduce the digital divide. As part of the financing, the Bank will promote access to training and employment in ICT-related fields for disadvantaged groups to help reduce within-country digital divides. EBRD's involvement remains crucial to ensure that all parts of society benefit from digitalisation. Policy Engagement and TA can help national authorities to (i) develop an appropriate national digital policy and (ii) support technical and financial modelling for state-intervention in areas of market failure.
- Support the development of green infrastructure investments: The Bank will continue to support the energy efficient upgrade of fixed and mobile networks. Previous examples include the financing of OTE and its mobile arm Cosmote. EBRD's on-going green policy work in relation to the ICT sector will support the development of taxonomies for green finance, such as green bonds, green labels and the development of markets for green assets in general. The Bank will continue to engage on resource efficiency, re-use and electronic waste management.

Primary TI Qualities targeted under this Focus Area:

3.3 Focus areas, potential TI, types of investment & possible Policy Engagement / TA



Focus Area II: New Technologies - Support investment in innovative technology and related services

To support the integration of disruptive technologies the Bank will focus on

- 1. Improve innovation and levels of technology penetration
 - Investment in a broad range of IT related companies, including: e-ecommerce, e-tech (e.g. fin-tech, health-tech, edu-tech), other web-based applications, smart industries and cities, e-government, digital switchover.
 - Investment in cross-sectoral technology companies, which support the digitalisation and automation of entire industries outside of ICT.
- 2. Increase **access to finance and entrepreneurship** supporting early stage growth companies in the ICT sector
 - Investment in innovative early stage growth companies through VC or other equity.
 - Mobilising third party financing and VC expertise through the VCIP programme.
- 3. Supported, where appropriate, by Policy Engagement and TA, including
 - Review of regulatory frameworks for implementation of competitive standards
 - Review of relevant policies, laws and regulations
 - Support compliance with EU and National Digital Agenda targets
 - Enhance capacity of authorities to support investment in / adoption of new technologies, while addressing national and global challenges including data protection and cyber security
 - Support adoption and implementation of e-Government platforms and initiatives
 - Support technological adaptation by private sector, including mature or established companies, to increase competitiveness and efficiency
 - Support project identification, preparation and feasibility
 - Mapping opportunities for sustainable investments
 - Prepare national digital policy including cybersecurity, disaster recovery, data regulations and compliance, digitalisation, and the impact of technology

EBRD's Transition Impact:

- Support ICT Readiness: By investing in new technologies companies, the EBRD supports innovation development in its CoOs as well as providing comfort to other investors. The investment in new technology companies will also support the digitalisation of other sectors, which is crucial for countries to be able to continue to compete on the world stage.
- Closing the digital divide: By supporting local new technology companies, access to skills development opportunities can be enhanced, which in turn will help address the closing of the digital divide.
- Support resilience through access to capital: By investing in early stage companies and conducting venture capital investments, the Bank increases the resilience of the sector and attracts other investors.
- Support the development of Climate Smart ICT: New technologies are crucial for the adoption of all industries to climate change. Sensors and digital energy management systems are an essential part of combatting rising electricity consumption and CO2 emissions. The Bank will continue to engage on resource efficiency, re-use and electronic waste management.





3.3 Focus areas, potential TI, types of investment & possible Policy Engagement / TA



Focus Area III - IT Services - Support growth of IT services and outsourcing companies

IT services companies are crucial for the digitalisation of societies, as they provide IT expertise to corporates and governments, including on such issues as cybersecurity. EBRD will support

- **1.** Financing IT Services companies focusing on providing modern IT systems to clients, such as (i) outsourced service providers (e.g. call centres), (ii) system integrators and (iii) software providers or similar.
- 2. Investments can be linked to **Policy Engagement and TA** in respect of regulation, related to e.g. data handling and protection such as the EU General Data Protection Regulation, cyber security, consumer protection as well as skills development with special focus on IT training, including dual learning programs.

EBRD's Transition Impact:

- Support ICT Readiness: The Bank will continue to finance IT outsourcing projects alongside infrastructure investments. This will help reduce companies' IT investment requirement, enable the Bank's CoOs to increase digitalisation of the private and public sector, and will enable e-government and smart city initiatives. Furthermore, by linking investments to TA,
- Support access to capital: The EBRD will support asset-light IT services companies which may face challenges raising finance, but which may be crucial in supporting companies on their path to digitalisation and local innovation.
- **Support skill development** by connecting financing with appropriate TA funded support.

Primary TI Qualities targeted under this Focus Area:

Resilient

Competitive

Focus Area IV: Privatisation & Commercialisation - Support privatisation and commercialisation of SOEs

The Bank will continue to focus on privatisations of SOEs in the ICT sector as well as commercialisation and pre-privatisation loans:

- 1. Increase **private sector ownership** participation through investment at the time of privatisation
- 2. Post-privatisation capital investment through investment at the time of privatisation and/or soon after, in order to fund capital or other investment needs, including, for example, fixed and/or mobile broadband expansion
- **3.** Commercialization and restructuring of SOEs through pre-privatisation investments linked to commercialisation and/or privatisation of SOEs.
- 4. To comply with the Bank's mandate, pre-privatisation investments and commercialisations will be linked to **Policy Engagement and TA**.

EBRD's Transition Impact:

 Support regulatory reform and ICT Readiness: Commercialisation, pre-privatisation and privatisation investments in SOEs will be linked to Policy Dialogue with regulators and other relevant authorities. This enables EBRD to support governments in designing programmes for state-intervention in areas of market failure and adopt and implement a legal and regulatory environment promoting liberalisation and competition, including opening up access to legacy or new networks, where appropriate. Furthermore, the financing of SOE's is mostly conditional on the implementation of appropriate improvements in corporate governance standards.

Primary TI Qualities targeted under this Focus Area:

Inclusive

Well-

Governed

3. The Bank's Approach in the ICT Sector

3.4. ICT focus by region

CEE & Baltics

- Infrastructure upgrades, altnets
- IT Companies
- VC ecosystem and investment
- Pre- and at-privatisation investment & support

EEC

- Infra investment, upgrades and expansion, altnets
- IT Companies
- Regulatory PE/TA
- VC ecosystem and investment
- Pre- and at-privatisation investment & support

CENTRAL ASIA

- Infra investment, upgrades and expansion, altnets
- IT Companies
- Regulatory PE/TA
- VC ecosystem and investment
- Pre- and at-privatisation investment & support

WESTERN BALKANS

- Infra investment, upgrades and expansion, altnets
- IT Companies
- Regulatory PE/TA
- VC ecosystem and investment
- Pre- and at-privatisation investment & support

SEMED

- Infra investment, upgrades and expansion, altnets
- IT Companies
- Regulatory PE/TA
- VC ecosystem and investment
- Pre- and at-privatisation investment & support

TURKEY

 Infra investment, upgrades and expansion, altnets

Turkey

PUBLIC

- Regulatory PE/TA
- IT Companies
- VC ecosystem and investment

The EBRD region of operation is comprised of diverse economies and a tailored approach is needed to take into account the specific country context.

The proposed strategic directions of the ICT Strategy are aligned with recently approved EBRD country strategies.

For example: the **North Macedonia** Strategy provides for a strong focus on ICT, including investment and TA support for broadband connectivity, digitisation and ICT related skills. The **Tunisia** Strategy provides for support and financing to facilitate privatisation, for technology start ups through VCIP and leveraging local ICT-graduates and youth training.

The ICT Strategy will also be aligned with the KEI which supports (i) ICT infrastructure, (ii) Technology upgrades (iii) VCIP investment and support and (iv) PE / TA support.

Armenia, Azerbaijan, Belarus, Georgia, Moldova, Ukraine

Central Asia (incl. Mongolia) Central Eastern Europe

31

SEMED

GREECE & CYPRUS

expansion, altnets

IT Companies

Infra investment, upgrades and

VC ecosystem and investment

Cyprus

Greece



4. Positioning EBRD vis-à-vis other IFIs and partners

4. Partnerships with Donors and other Partners

4.1 Overview of Donor Financing



Investments and advisory in the ICT sector have been possible thanks to generous support from the donor community and partners. Joint efforts to foster sustainable, affordable and cost effective ICT networks and services will continue thanks to this support.

Areas where future donor financing/co-financing is needed

Co-Investment Grants

- Incentives for investments (GET, innovation, inclusion)
- Capital grants (CAPEX, ICT Adaptation among SMEs, e-Government)
- Risk sharing facilities (loss guarantee for rural broadband)

Technical Cooperation

- Policy engagement
- Policy development
- Legal/regulatory support
- Capacity and institution building
- Financial and technical modelling
- Feasibility Studies
- Market Studies
- Project preparation (due diligence) and implementation

Approach to donor co-financing

- Accelerating Broadband Connectivity (ABC) Initiative as a means of engaging donors in the first instance
- Cooperation with multilateral donors such as EU across more regions
- Identify other multilaterals with similar sector approach/objectives
- Engage in regional programmes, to increase impact
- Increase engagement with bilateral donors across areas/regions

Implementation modalities

- Include TC funding to provide integrated approaches to transition challenges
- Developing blended products to leverage EBRD financing with grants
- Focusing on strengths and expertise of EBRD ICT:
 - Support development of broadband strategies
 - Work with government in designing frameworks for intervention in instances of market failure
 - Support the development and adoption of best practice policy and regulation across the ICT sector
 - Assist private investors in participation in state broadband programmes
 - Map opportunities for sustainable investment and help companies to identify areas of their businesses that can be adapted with ICT to be made more efficient
 - Assist companies to support inclusive growth and job creation
 - Support government in digitising public services and landscape development through dedicated TC
 - Support the development of national and regional expertise on design, piloting, deploying and financing ICT infrastructure
 - Promote women's participation in the ICT sector through upskilling, twinning programmes, promotion of equal opportunities and coding initiatives.

4. Partnerships with Donors and other Partners

4.2 Mapping of International Partners' Complementarity in the ICT Sector in EBRD's CoOs 2014-2018



Between 2014-2018 the EIB made several investments in our CoO, some in the private sector, with companies like Orange Poland, T-Mobile Poland, Slovenia Telekom and Tunisie Telecom. Also, the EIB took part in several cross-regional and state level initiatives with respect to better connectivity and infrastructures upgrades.

The EIB Group provides technical assistance via grants to enhance the development impact of its projects and strengthen the capacity of its financial counterparties and final beneficiaries. Funds are intended mainly to address weaknesses in human resources management and operations, management information systems (MIS) and technology, governance, internal audit and risk management procedures.

The EIB applies the EU range of policies and standards in its operations.

Between 2014-2018 the IFC made 6 investments in our CoOs: Zenium in Turkey, TCell in Tajikistan, Virgin Mobile in EEC, TeamNet in Romania, Logo in Turkey and SAB SAS in SEM.

The IFC offers an advisory platform that consists of seasoned experts. The bank's policy supports, among others, gender equality, strategic business solutions, corporate governance and environmental, social, and governance issues.

World Bank

IFC

EIB

The World Bank provides technical assistance mainly to countries' governments, and offers, among others, advice and training on Open Data strategies, technology and policy best practices to support client countries' open agendas.

Between 2014-2018 FMO made 5 investments in CoOs, entirely in private sector, with two being in Magticom, a Georgian internet service provider, by providing two loans along side the EBRD.

With respect to technical assistance, FMO offers the Capacity Development Program which contribute to the cost of hiring external consultants, trainers and experts to facilitate the knowledge transfer and provision of technical expertise.

FMO's policy engagement focus areas are: gender equality, governance and risk management, sustainability, as well as environmental and social risk management.

BSTDB

Between 2014-2018 the BSTDB made 4 investments in our CoOs: TeamNet in Romania, Hightel in Albania, MLS in Greece and OTE also in Greece, where the Bank participated together with the EBRD in providing loan to the corporation.

BSTDB offers the Black Sea Project Promotion Facility – technical assistance assignments to assist in the development of bankable projects by potential recipients of BSTDB financing in the areas of preparation of pre-feasibility and feasibility studies, preparation, finalization, or reformatting of business plans, preparation of financial accounts and legal, technical, and environmental due diligence.

With respect to policy, the BSTDB aims to promote environmental and social sustainability in its member states.

4. Partnerships with Donors and other Partners

4.3 International Partners' Complementarity in the ICT Sector in EBRD's CoOs 2014-18





Please note: IFIs activity mapping based on publicly available information. The bubbles illustrate the scale of investment. According to their websites, neither the Asian Development Bank nor KfW Bankengruppe invested in the ICT sector in our CoOs between 2014-2018.





5. Measuring results

5.1 Performance Monitoring Framework



		Tracking indicators					
Specific objectives	Activities	Outputs	Outcome (for relevant countries tracked in Country Strategies)				
1. Support investment in the roll-out and enhancement of ICT infrastructure (Competitive, Inclusive, Green, Integrated)							
 1.1 Improved quality of infrastructure for effective/efficient economy interactions. 1.2 Improved rural, regional and international connectivity through technology infrastructure 	 Investments Capacity building Policy engagement External partnerships 	 Number/Volume of investments supporting ICT infrastructure including broadband, infrastructure sharing, IT outsourcing and mobile networks Number/Volume of projects increasing access to ICT services in targeted regions 	 Net increase in ICT infrastructure usage and/or capacity through Bank assisted projects including ICT services production, transmission and distribution infrastructure (e.g. fixed and mobile backbone infrastructure). Net increase in ICT infrastructure capacity (regional and/or cross-border) through Bank-assisted projects (e.g. cross-border network infrastructure) Number of beneficiaries with new/improved access to IT Services (e.g. access to fibre broadband, 4G mobile broadband) Number investments that improve integration into regional/global value chains Total CO2 Emissions reduced (tonnes/yr) Number of clients that improved energy management standards (including building /goods certifications) 				
2. Support investment in innovative technology and	related services (Competiti	ve, Resilient, Inclusive, Green)					
 2.1 Improved innovation and levels of technology penetration 2.2 Increase access to finance and entrepreneurship supporting early stage growth companies in the ICT sector 2.3 Increase access to digital skills development opportunities for target groups 2.4 Adequate regulatory frameworks in place on implementation of competitive standards 	 Investments Capacity building Policy engagement External partnerships 	 Number/Volume of investments supporting introduction of new ICT related products or services Number/Volume of investments in venture capital projects related to ICT infrastructure Number of policy engagements and capacity building activities promoting the technology sector ecosystems including e- commerce and e-tech 	 Number of clients introducing innovative/new ICT related technology Number of individuals in target group enhancing their skills as a result of training Legal/regulatory/institutional frameworks for ICT sector for improving venture capital ecosystem including for ICT technology Total CO2 Emissions reduced (tonnes/yr) Number of clients that improved energy management standards (including building /goods certifications) 				

5. Measuring results

5.1 Performance Monitoring Framework (Continued)



		Tracking indicators				
Specific objectives	Activities	Outputs	Outcome (for relevant countries tracked in Country Strategies)			
3. Support growth of IT services and outsourcing co	ompanies (Resilient, Compe	titive and Inclusive)				
 3.1 Improved level of digitalisation of other industries and governments 3.2 Increase access to finance and entrepreneurship supporting IT services companies 3.3 Increase access to skills development opportunities reducing the digital divide 	 Investments Capacity building Policy engagement External partnerships 	 Number/Volume of investments in IT services and outsourcing companies Number/Volume of investments supporting digitalisation projects of industries and/or governments Number/Volume of projects supporting ICT related skill development (within underserved regions, between CoOs and more developed markets) Number of policy engagements and capacity building activities promoting the technology sector ecosystems including e-commerce and e-tech 	 Number of beneficiaries with new/improved access to IT Services (e.g. e-government services) Number of individuals in target group enhancing their skills as a result of training (e.g. through dual learning programs) Legal/regulatory/institutional frameworks for ICT sector for improving digitalisation 			
4. Privatisation & Commercialisation - Support priv	atisation and commercialis	ation of SOEs (Competitive and Well-governed)				
 4.1 Increase private sector ownership participation 4.2 Commercialization and restructuring of SOEs whilst ensuring adequate regulatory frameworks in place on implementation of competitive safeguards 	 Investments Capacity building Policy engagement External partnerships 	 Number/Volume of investments supporting commercialization, pre- privatisation and privatisation of ICT infrastructure and services Number/Volume of investments supporting commercialization and restructuring of SOEs Number of policy engagements and capacity building activities promoting effective ICT regulatory environment including data and digital policy 	 Number of clients improving their performance or efficiency metrics after commercialisation/restructuring/ privatisation Number/qualitative account of clients implementing full or partial privatisation with the Bank's assistance Legal/institutional/regulatory improvements to improve competition as targeted Total CO2 Emissions reduced (tonnes/vr) 			
Context Indicators						
Context Indicator 1: LTE Mobile Network Penetration (%). Context Indicator 2: Fixed Broadband Penetration (%) Context Indicator 3: Fibre Penetration (%) Context Indicator 4: Internet Bandwidth (bps) Context Indicator 5: Internet Users (%) Please find baseline for context indicators in Annex III.						



Annexes



Sector Team	Approach
Financial Institutions	Information technology is having a profound impact on the banking sector and payments systems. Examples include mobile payments and blockchain.
Property and Tourism	Technology hubs, IT parks, smart buildings and data centres play an increasing role in developing and enabling the knowledge economy.
Municipal and Environmental Infrastructure	There is increasing emphasis on the development of smart cities (which includes digital solutions for urban challenges, to enhance the quality of life and in-depth data analysis informing urban policy decisions. This could include: smart utility management (water, power, waste); smart transport management, smart lighting; e-government; health and education).
Power & Energy / Transport	Communications providers may look to alternative network distribution methods (such as power grids, tower sharing or rights of way along side transport networks) in order to reduce capital costs and/or time to market and/or to be able to compete effectively against more established players.
Manufacturing and Services	Automation of processes and technological upgrades are having an increasing impact on the manufacturing and services sector.
Equity Funds	Some equity funds specialise in the ICT sectors and sub-sectors.
Agribusiness	New technologies are being used to improve the precision and efficiency of agricultural management practices ('precision agriculture'). Significant technological advances are being made in plant and animal breeding, remote sensing, weather prediction and data analytics.

Furthermore, the ICT team is working with several other departments: E2C2, LC2, EPG, ABS, SME Finance & Development



EBRD projects are required to comply with the Bank's Environmental and Social Policy (E & S Policy) and associated Performance Requirements (PRs). The environmental and social issues and mitigations associated with the ICT sector typically include:

- 1. Environmental and social management the sector's E & S issues and impacts are limited and therefore mitigation measures are likely to be compliance with relevant law and EU requirements as well as implementation of general E &S management system such as ISO14001 and OHSAS18001.
- 2. Environmental permits official environmental permits associated with cable network and tower installations as potential issue. Mitigating measures include compliance with applicable law including public consultation provisions.
- 3. Energy usage energy usage in the context of data centres or other facilities' as potential issues. Mitigating measures include energy efficient intervention on mobile cell sites or installation of photovoltaic cells.
- 4. Occupational Health and Safety OHS issues are mostly associated with civil work. Mitigating measures include OHS management and contractor management.
- 5. Human resource issues labour re-structuring in the context of privatisation or mergers/acquisitions as potential issues. Mitigating measures include a retrenchment plan.
- 6. Privacy and Security of data an emerging issue among internet-based business operations. Mitigating measures include compliance with EU directives on information privacy.

EBRD's ICT clients are required to identify environmental and social issues relating to projects as well as avoid and minimise risks by adequate mitigation measures in compliance with PRs. In order to ensure the project's compliance with PRs, an Environmental and Social Action Plan (ESAP) may be developed to be included into the legal agreement. The Bank will support the development and implementation of projects with GET elements by promoting more efficient energy and water usage. The Bank will also work on institutional strengthening and policy engagement, where relevant.

Details of the Environmental and Social Policy can be found at: http://www.ebrd.com/news/publications/policies/environmental-and-social-policy-esp.html

Annex III Sector Indicators



	LTE Mob	ile Network	Network Fixed Broadband Internationa netration penetration		International internet ba	ernational internet bandwidth per user		Internet users (% of		Fibre to the home penetration	
		Penetration			(bit/s)		households)				
	2012	2017	2012	2017	2012	2016	2012	2016	2012	2016	
Albania	-	85.30%	5.48%	10.02%	30000	121250	54.66%	66.36%	0.74%	3.80%	
Armenia	17.54%	90.05%	7.36%	10.76%	30000	111054	37.50%	64.35%	5.23%	17.18%	
Azerbaijan	6.68%	42.00%	14.78%	18.37%	94000	260000	54.20%	78.20%	2.47%	6.41%	
Belarus	-	68.50%	26.73%	33.41%	350000	1104080	46.91%	71.11%	0.97%	27.27%	
Bosnia and Herzegovina	-	-	12.87%	18.92%	60000		45.06%	60.26%	0.03%	0.09%	
Bulgaria	-	99.34%	18.22%	24.91%	342855	885180	51.90%	59.83%	13.54%	31.35%	
Croatia	13.90%	98.31%	21.39%	26.16%	100000	224547	61.94%	72.70%	0.59%	1.77%	
Cyprus	n/a	96.00%	25.53%	34.79%	48000	39210	60.69%	75.90%	0.03%	0.00%	
Egypt	-	61.00%	2.61%	5.35%	150906	579897.08	26.40%	41.25%	n/a	-	
Estonia	70.00%	99.00%	26.38%	30.90%	27000	234751	78.39%	87.24%	20.64%	27.27%	
Georgia	n/a	99.72%	11.27%	19.69%	50000	217823	36.94%	59.26%	19.68%	41.45%	
Greece	35.13%	98.00%	23.64%	33.86%	400000	527780	55.07%	69.09%	0.08%	0.16%	
Hungary	27.00%	99.00%	24.28%	30.41%	506646	1213120	70.58%	79.26%	8.07%	13.59%	
Jordan	-	-	3.76%	n/a	15000	159420	37.00%	62.30%	0.08%	0.96%	
Kazakhstan	2.67%	72.50%	9.68%	14.14%	277845	1134291	61.91%	74.59%	8.30%	27.21%	
Kosovo	-	-	-	n/a	38200	0	-	-	n/a	n/a	
Kyrgyzstan	n/a	50.00%	0.98%	4.27%	4608	130711	19.80%	34.50%	0.00%	8.71%	
Latvia	26.67%	n/a	23.04%	26.96%	90000	398189	73.12%	79.84%	n/a	34.75%	
Lebanon	n/a	-	9.69%	n/a	52500	212763	61.25%	76.11%	-	-	
Lithuania	44.44%	98.00%	25.31%	27.64%	150727	441314	67.23%	74.38%	30.85%	42.35%	
Moldova	22.87%	97.00%	10.27%	14.42%	143540	349184	43.37%	71.00%	16.03%	27.47%	
Mongolia	-	21.00%	3.91%	9.27%	43246	109579	16.40%	22.27%	10.68%	-	
Montenegro	10.00%	98.00%	14.01%	21.85%	11850	88100	56.84%	69.88%	-	7.12%	
Morocco	n/a	93.00%	2.07%	3.86%	120000	515010	55.42%	58.27%	n/a	0.16%	
Poland	50.00%	n/a	17.98%	18.48%	1016300	2333587	62.31%	73.30%	1.38%	4.06%	
Romania	54.00%	83.20%	17.56%	24.29%	1254000	1991000	45.88%	59.50%	24.26%	31.57%	
Russian Federation	25.00%	62.00%	14.59%	21.44%	1900000	5619162	63.80%	73.09%	21.24%	37.69%	
Serbia	n/a	94.40%	14.85%	21.21%	334036	263349	48.10%	67.06%	0.26%	1.75%	
Slovakia	11.15%	92.00%	19.30%	25.79%	50000	230087	76.71%	80.48%	10.25%	15.67%	
Slovenia	12.80%	98.60%	24.72%	28.93%	139309	376043	68.35%	75.50%	12.69%	23.31%	
Tajikistan	8.38%	-	0.07%	n/a	2500	4367	14.51%	20.47%	-	-	
North Macedonia	n/a	96.00%	15.06%	18.56%	70167	165928	57.45%	72.16%	1.38%	3.79%	
Tunisia	n/a	87.00%	4.84%	6.95%	84480	190000	41.44%	49.60%	0.04%	0.33%	
Turkey	n/a	86.52%	10.55%	14.77%	880000	3076960	45.13%	58.35%	3.83%	10.91%	
Turkmenistan	· -	-	0.03%	n/a	650	2267	7.20%	17.99%	-	-	
Ukraine	n/a	-	8.04%	12.55%	642968	1792730	35.27%	53.00%	5.82%	9.73%	
Uzbekistan	n/a	43.00%	0.75%	10.40%	5000	80000	23.60%	46.79%	0.38%	-	
OECD Comparators Average	56.16%	98.90%	31.80%	36.70%	5,601,959	11,850,044	81.88%	86.29%	11.06%	18.46%	

PUBLIC OECD Comparators are Canada, Czech Republic, France, Germany, Japan, United States, United Kingdom, Sweden

Annex IV

Potential for EBRD ICT Projects to contribute to Sustainable Development Goals



	1 POVERTY	4 QUALITY EDUCATION	5 GENDER EQUALITY	7 AFFORDABLE AND CLEAN ENERGY	8 DECENT WORK AND ECONOMIC GROWTH	9 INDUSTRY, INNOVATION AND INFRASTRUCTURE	10 REDUCED INEQUALITIES	11 SUSTAINABLE CITIES	13 CLIMATE ACTION	16 PEACE, JUSTICE AND STRONG INSTITUTIONS
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Competitive										
Green										
Inclusive										
Integrated										
Resilient										
Well-governed						Ø				
EXAMPLE	Digital financial services	Digital learning	Access to information	ICT enable solutions (e.g. Smart Grids)	ICT based economic growth	Innovative digital infrastructur	Reduced digital divide	Smart city solutions	ICT monitoring and warning systems	Open data big data

Medium



High



In the ICT Sector the Bank's Policy Engagement and Technical Cooperation activities have ranged from advice on policy, drafting/amendment of laws/regulations, development of regulatory methodologies, capacity building/training, institutional/governance advisory, financial & technical modelling.

Specific engagements during the previous strategy period included:

Armenia: supporting the Public Services Regulatory Commission (PSRC) in designing, adopting and implementing a framework for number portability;

Cyprus: Supporting the Office of the Commissioner for Electronic Communications and Postal Regulation (OCECPR) in the design of and adoption of a National Broadband Plan,

Georgia: Working with the Georgia National Communications Commission (GNCC) and the Ministry for Economy and Sustainable Development (MOESD) to draw up, adopt and implement amendments to the telecom and audio-visual regulatory framework aimed at harmonising Georgia's regime with that of the EU: **Georgia**: Working with the GNCC and MOESD to implement the switchover from analogue to digital TV broadcasting.

Kosovo: Working with the Agency for Regulation of Electronic Communications and Post (ARKEP) and the Ministry for Economic Development to build knowledge and capacity in the best practice policies, laws, and methodologies that underpin regulation of the ICT sector;

Serbia: Working with the Ministry for Trade Telecom and Tourism to develop costing, financing and implementation models for nationwide broadband deployment;

Tunisia: Working with the Ministry of Communication Technologies and Digital Economy to identify recommendations for attracting new, and accelerating planned, investment into broadband infrastructure

Uzbekistan: Working with the Ministry for Development of Information Technologies and Communications to review the ICT sector and develop recommendations for harmonisation of local regulations and practices with international best practices.



The ICT team will work closely with the EU and with other IFIs in order to benefit from EU funding through Guarantees and TC funding.

	WITHIN EU	OUTSIDE EU
PRESENT	 Juncker Plan – EFSI and ESIF EIB only Connecting Europe Broadband Fund Financing smaller broadband projects in underserved areas of Europe Diorama Hellenic Growth Fund Investing in growth and expansion stage SMEs and mid-cap companies in Greece Inven Capital Fund Supports clean energy and smart technology SMEs in Czech Republic 	 EIP - External Investment Plan Eastern Europe and Caucasus and Southern and Eastern Mediterranean EU guarantees provided for: Investment into digital infrastructure and services Technical Cooperation funding for policy dialogue and project support Total Fund of € 4.1 billion (of which EFSD Guarantee amounts to €1.5 billion + €2.6 billion of blended funding)
FUTURE	 Invest EU 25% of €38 billion (€9 billion) will be open to a broad range of partners, including EBRD Includes a window for Research, Innovation and Digitisation (Digital Connectivity) Smart Cities Investment Platforms Slovakia and Hungary 	 NDICI - Neighbourhood Development International Cooperation Instrument Eastern Europe and Caucasus and Southern and Eastern Mediterranean, Central Asia Total Fund of € 89.2 billion (of which €60 billion of EFSD+ Guarantee)

Annex VI (Continued) Partnering with other IFIs and International Organisations

European

Bank

Finance for Developmen

Investment

European Bank for Reconstruction and Development

The Bank has worked closely with other agencies and will continue to do so.

European Union

European Investment Bank

International Finance Corporation

Netherlands Development Finance Company

Black Sea Trade & Development Bank



FMO

Effective 1 September 2014, EBRD entered into a risk sharing arrangement applicable to risk-sharing transactions and direct financing under the EU Deep and Comprehensive Free Trade Area (DCFTA) agreement with Georgia. In April 2015 the bank approved a loan of up to EUR 1.8 M for the financing of the build-out of the digital terrestrial TV network as part of the Digital Switch-Over process in Georgia where the European Commission is providing a risk sharing facility.

In July 2017 the Bank supported OTE's mobile arm Cosmote with a EUR 150 million syndicated loan to fund the

expansion of the 4G/4G+ network and the use of state-of-the-art climate-friendly technology. EIB provided a parallel





WORLD BANK GROUP

European union

In July 2014 the Bank approved a EUR 10 million equity investment into VMCEE alongside 3 other investors, one of them being the IFC, for the development of VMCEE's operations in Poland and launch of operations in Turkey. In May 2015 the Bank approved an USD 15 million co-investment with Abraaj Group for the acquisition of 9.25 % stake in Hepsiburada the leading player in the Turkish online retail sector. IFC also approved up to USD 20M investment. The total of USD 112 million use will compromise direct capital injection and equity purchase which will fund the growth of the business.

In July 2016 the Bank approved a USD 100 million senior secured Loan to MagtiCom, a leading telecoms operator

in Georgia in order to finance the acquisition of the retail assets of Caucasus Online, the second largest Internet

Service Provider in Georgia. The loan consisted in an A loan of USD 75 million for the Bank's own account and a B

¹loan of USD 25 million from the Netherlands Development Finance Company ("FMO"). In July 2017 the Bank approved a new loan of USD 40 million Loan to finance MagtiCom's acquisition of Deltacomm, of which USD 10



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In September 2016 the Bank provided Hellenic Telecommunications Organisation (OTE) with finance of EUR 200 million comprised of EUR 150 million in Ioan and EUR 50 million in bond with BSTDB providing additional Ioan of EUR 50 million.

loan in the amount of EUR 150 million to Cosmote.

million was syndicated to FMO.

Annex VII

Key transition challenges by region



	The CEB economies have managed to develop relatively advanced knowledge economies with favourable institutional frameworks and
	ICT infrastructure. They start to "make" their own technology but innovation "new to the world" remains rare. Skills for innovation and the
	efficiency of the R&D sector remain weak. The telecome sector has been privatised. There is active competition in the mobile segment.
CEB	 There is still room for alternative network operators to provide stronger competition to the incumbents and further expand the availability
	of fast broadband in the more remote areas.
	 The regulatory frameworks have been aligned with the EU framework.
	 The enforcement of the intellectual property rights could be further improved as, for example, the software piracy rates still remain above the EU average, although significantly below the rates in the other EBRD sub-regions.
	 The SEE countries are mostly at an intermediate level of knowledge economy development, with skills mismatches and weak IPR
	protection constraining further development. These countries primarily still "buy", not "make" innovation.
	 A few privatisations of major telecom assets have yet to occur.
	 Improvements in SOE corporate governance can be made.
	 Most countries have active competition with at least three mobile operators.
SEE	 There is still room for alternative network operators to provide stronger competition to the incumbents and further expand the availability of fast broadband in underserved areas.
	 There is room for further alignment of the telecommunications regulatory frameworks with best practices and active engagement by the
	authorities to design and implement viable programmes to accelerate broadband deployment across national territories and address the digital divide
	 Effective protection of intellectual property rights remains a challenge as reflected in still relatively high software piracy rates.

Annex VII (Continued)

Key transition challenges by region



EEC	 Most EEC countries are at early stage of developing knowledge economies, being constrained by weak institutions and ICT. The state controls most incumbent operators and strategic investors are yet to play a strong role in the fixed segment. Most countries have at least three mobile operators. The presence of alternative telcos remains low and the broadband internet infrastructure needs to be further developed. The telecommunications regulatory regime needs further development. Effective protection of intellectual property rights remains a challenge (as reflected in still very high software piracy rates) as does efforts by government to accelerate broadband deployment and narrowing of the digital divide.
Turkey	 Turkey is at an intermediate stage of developing its knowledge economy, with challenges in further improving institutions for innovation, strengthening the ICT infrastructure in more remote areas, and improving the quality of scientific education. The telecom incumbent has been privatised, but the state still holds a minority stake. There are three mobile operators in the country. The incumbent's market share has been decreasing, although from a very high level. Although relatively developed, the regulatory framework needs further implementation. Protection of intellectual property rights remains a challenge.
SEMED	 The SEMED region is still largely at an early stage of the development of knowledge economies, thus focus on institutions and ICT is needed to advance further. Some of the incumbents have already been privatised. There are at least three mobile operators in each country. The incumbents continue to dominate and the presence of alternative network operators remains low. The regulatory regime should be further aligned with best practices. Intellectual property protection needs to be further supported (as indicated by the relatively high software piracy rates) Efforts by government to accelerate broadband deployment and narrowing of the digital divide should be redoubled.
Central Asia and Russia	 Russia and Kazakhstan have more advanced regulatory regimes. More needs to be done to promote competition and an effective protection of intellectual property rights. The incumbents are yet to be privatised. The presence of alternative network operators remains low and the ICT infrastructure needs to be further developed. Efforts by government to accelerate broadband deployment and narrowing of the digital divide should be redoubled.