PROJECT APPRAISAL DOCUMENT

ON A

PROPOSED LOAN

IN THE AMOUNT OF

US$ 24 MILLION

TO THE

REPUBLIC OF ARMENIA

FOR AN

E-SOCIETY AND INNOVATION FOR COMPETITIVENESS (EIC) PROJECT

October 28, 2010
CURRENCY EQUIVALENTS

(Exchange Rate Effective October 25, 2010)

Currency Unit = Armenian Dram (AMD)
AMD 359.50 = US$1

FISCAL YEAR
January 1 – December 31

ABBREVIATIONS AND ACRONYMNS

ADB  Asian Development Bank
CA  Certification Authority
CAGR  Compound Annual Growth Rate
CBA  Central Bank of Armenia
CIDA  Canadian International Development Agency
CMMI  Capability Maturity Model (Integrated)
CPS  Country Partnership Strategy
CQS  Consultant’s Qualifications Selection
CRM  Customer Relations Management
DFID  Department for International Development (UK)
EBRD  European Bank for Reconstruction and Development
EIB  European Investment Bank
EIF  Enterprise Incubator Foundation
EKENG  E-Governance Infrastructure Project Implementation Unit (Arm., Ministry of Economy)
EU  European Union
FDI  Foreign Direct Investment
FFPMC  Foreign Financed Projects Management Center (Ministry of Finance)
FY  Fiscal (Financial) Year
GEF  The Global Environment Facility
GTC  Gyumri Technology Center
IBRD  International Bank for Reconstruction and Development (World Bank)
ICB  International Competitive Bidding
ICT  Information and Communications Technologies
ID  Identification (document)
IDA  International Development Association (World Bank)
IOM  International Organization for Migration
IP  Internet Protocol
IPR  Intellectual Property Rights
IT  Information Technology
ITU  International Telecommunications Union
IMF  International Monetary Fund
LAN  Local Area Network
LDC  Least Developed Countries
MDG  Millennium development goals
NCB  National Competitive Bidding
NCFA  National Competitiveness Foundation of Armenia
NGO  Non-governmental Organization
NSSA  National Statistical Services of Armenia
ODA  Official Development Assistance
OECD Organization for Economic Co-operation and Development
OJSC Open Joint Stock Company
OP Operational Policy
OSCE Organization for Security and Cooperation in Europe
PAD Project Appraisal Document
PFM Public Financial Management
PHRD Program for Human Resources Development (Japan)
PKI Public Key Infrastructure
PPP Public Private Partnership
PPIAF Public Private Infrastructure Advisory Facility (World Bank)
PRSP Poverty Reduction Strategy Paper
PSRC Public Services Regulatory Commission
QCBS Quality- and Cost-Based Selection
SBD Standard Bidding Document
SCPEC State Commission for the Protection of Economic Competition (Competition Authority)
SME Small and Medium Enterprises
SMP Significant Market Power
TA Technical Assistance
TAL Technical Assistance Loan
TORs Terms of Reference
UN United Nations
UNCTAD United Nations Conference on Trade and Development
UNDP United Nations Development Programme
USAID United States Agency for International Development
VC Venture Capital
VPN Virtual Private Network
WB / WBG World Bank / World Bank Group
WTO World Trade Organization

Vice President: Philippe Le Houerou
Country Director: Asad Alam
Sector Director: Jose Luis Irigoyen
Sector Director: Gerardo Corrochano
Country Manager: Jean-Michel Happi
Sector Manager: Philippe Dongier
Sector Manager: Sophie Sirtaine
Task Team Leader: Juan Navas-Sabater
Co-Task Team Leader: Karen Grigorian
# ARMENIA

Armenia E-Society and Innovation for Competitiveness Project

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ARMENIA
ARMENIA E-SOCIETY AND INNOVATION FOR COMPETITIVENESS (EIC) PROJECT
PROJECT APPRAISAL DOCUMENT
EUROPE AND CENTRAL ASIA
TWICT

Date: October 25, 2010
Team Leader: Juan Navas-Sabater
Country Director: Asad Alam
Sectors: Information technology (30%); Telecommunications (25%); General finance sector (20%); Tertiary education (15%); General public administration sector (10%)
Sector Manager/Director: Philippe Dongier, Sophie Sirtaine
Themes: Export development and competitiveness (29%); Infrastructure services for private sector development (29%); Technology diffusion (14%); Education for the knowledge economy (14%); Other public sector governance (14%)
Project ID: P115647
Environmental category: Partial Assessment
Lending Instrument: Specific Investment Loan
Joint IFC:
Joint Level:

Project Financing Data

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Borrower:
Republic of Armenia
Ministry of Economy
5 Mher Mkrtchyan str
Armenia
0010
Tel: (374-10) 526-134Fax: (374-10) 526-577
akhechoyan@mineconomy.am
www.mineconomy.am
Responsible Agency:
Foreign Financing Projects Management Center (FFPMC)
Republican square, Government House No.1
Armenia
0010
Tel: (374-10) 523-471 Fax: (374-10) 528-742
info@ffpmc.am

Enterprise Incubator Foundation
123 Hovsep Emin Street
Armenia
0051
Tel: (374-10) 219-797 Fax: (374-10) 219-777
info@eif.am
www.eif.am

Estimated disbursements (Bank FY/US$m)

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Project implementation period: Start January 10, 2011   End: June 30, 2014
Expected effectiveness date: January 10, 2011
Expected closing date: December 31, 2014

Does the project depart from the CAS in content or other significant respects?  Ref. PAD I.C.  
[ ]Yes  [ X] No

Does the project require any exceptions from Bank policies?  Ref. PAD IV.G.  
[ ]Yes [X] No

Have these been approved by Bank management?  
[ ]Yes [ ] No

Is approval for any policy exception sought from the Board?  
[ ]Yes [X] No

Does the project include any critical risks rated “substantial” or “high”?  Ref. PAD III.E.  
[X]Yes [ ] No

Does the project meet the Regional criteria for readiness for implementation?  Ref. PAD IV.G.  
[X]Yes [ ] No

Project development objective  Ref. PAD II.C., Technical Annex 3
The Project Development Objective (PDO) is to address constraints to competitive e-Society and enterprise innovation in Armenia by strengthening the underlying infrastructure and enabling environment.

Project description [one-sentence summary of each component]  Ref. PAD II.D., Technical Annex 4
The project is designed as a Specific Investment Loan, with two substantive components.

Component 1. e-Society Infrastructure Development. This component will provide financing to support the design and development of the Armenian ICT infrastructure required for e-Society
through: (a) Supporting sub-project for deployment of national broadband information infrastructure, including backbone network and broadband access on a PPP basis with adequate international linkages and necessary connections for public institutions throughout the country (government virtual private network); (b) Supporting a Digital Citizen program aimed at enhancing trust and security in the provision of electronic services and hence promote further uptake of electronic services by citizens and businesses through support to the creation of a national certification authority for electronic signatures; and (c) Promoting increased computer penetration and digital literacy through a Computer for All Program.

Component 2. Fostering Enterprise Innovation. This component will focus on supporting programs, financial mechanisms and infrastructure that will create a favorable enabling environment for knowledge and technology-driven companies through: (a) Promoting financial support for innovation in knowledge and technology-intensive firms, through various grant programs to support innovation and creation of a Seed and Early Stage Venture Fund; (b) Providing support for the establishment of the Gyumri Technology Center, to provide technology support and incubation services to local firms and entrepreneurs as an important piece in the government's strategy for regional economic development in the Gyumri marz; and (c) Providing assistance for the development of the IT/Knowledge-intensive industry in Armenia, by supporting skills and technology development, and firms' linkages with demanding international markets and Armenian research capabilities, including establishment of Sales Force representation Office.

A third component for project management will provide assistance for management and monitoring of project implementation.

Which safeguard policies are triggered, if any?  
Ref. PAD IV.F., Technical Annex 10
OP/BP 4.01 Environmental Assessment
OP/BP 4.04 Natural Habitats
OP/BP 4.11 Physical Cultural Resources

Significant, non-standard conditions, if any, for:  
Ref. PAD III.F.

Covenants applicable to project implementation:
The project will have five disbursement conditions: a) in relation to activity 1.1.2, Nationwide Broadband Backbone and Government Network, the Borrower has signed a Subsidiary Finance Agreement with NCFA and approved a Broadband Networks Operational Manual, both acceptable to the Bank, and the relevant Beneficiary has met the criteria set forth in said Manual; b) in relation to activity 1.3.1, Line of Credit for the Computer for All Program, the Borrower has signed a Subsidiary Finance Agreement with PFI(s) and has approved a Computer for All Operational Manual, both acceptable to the Bank, has selected Vendor(s) in accordance with the procedures established in said Manual, and the relevant Beneficiary has met the criteria set forth in said Manual; c) in relation to activity 2.1.1, Ideas Generation Grants and Innovation Matching Grants, the Borrower has signed a Subsidiary Finance Agreement with EIF and has approved a Grants Operational Manual, both acceptable to the Bank, and the relevant Beneficiary has met
the criteria set forth in said Manual; d) in relation to activity 2.1.2, Seed and Early-Stage Venture Fund, the Borrower has signed a Subsidiary Finance Agreement with the Venture Fund and adopted a Seed and Early-Stage Venture Fund Operational Manual, both acceptable to the Bank, has selected competitively a private manager for the Fund, has adopted the draft by-laws, investment guidelines, and has otherwise complied with all the obligations indicated in the Loan Agreement, the Fund has been incorporated, and the private investors have committed resources to the Fund; and e) in relation to activity 2.3.1., Industry Promotion and Managerial Secondments, the Borrower has selected competitively a professional management company for the Sales Force Representation Office in Silicon Valley and a Sales Force Representation Office Operational Manual acceptable to the Bank has been adopted.

In relation to the latter, a dated covenant has also been established to ensure that within one year from the establishment of the office at least one private partner has committed resources to co-finance the office.
I. STRATEGIC CONTEXT AND RATIONALE

A. Country and sector issues

1. Armenia is a lower middle income country with a gross national income per capita of $3,350 (GNI per capita, Atlas method, 2008). The country is comprised of 10 regions (marzes) and the capital city of Yerevan, which also has the status of a marz. About 64% of the total 3,077,087 population lives in urban areas, of which one third lives in Yerevan. The services sector, concentrated in trade is one of the leading sectors of the economy that generates 34% of GDP.

2. Armenia’s prospects for inclusive and long-term growth require it to diversify into knowledge-driven sectors and upgrade the quality of domestic products and services. The Global Competitiveness Report 2009-2010 ranks Armenia 97 out of 133 countries on the GCI index. As a land-locked country Armenia is subject to transportation cost disadvantages that can only be compensated by moving to higher value products and services.

3. In this context, the Government of Armenia (GoA) has demonstrated significant commitment to developing the ICT and knowledge-intensive sector by adopting its Information Technology Sector Development Concept Paper (Annex to the RA Government Decree No. 35 dated August 28, 2008), which lays out the government’s vision for the sector as achieving a “sustainable information society with advanced ICT infrastructure, high-level computer literacy, high level of computer saturation and Internet access, extended use of e-services systems, existence of sophisticated local IT market and progressive knowledge-based industry.”

4. The IT Sector Development Concept Paper calls for accelerated ICT infrastructure development in order to converge with European standards and to meet the government’s expectations of economic development of the country. The results expected within the next five years include the following: 50% of priority government services are available online, 80% public sector computer penetration and 70% Internet penetration among country population, implying that the majority of government offices would need to be provided with broadband Internet access within that time frame. Currently, though, less than 5% of services are available online with 10% computer and internet penetration in the public sector.

5. The current pace of uptake of broadband services in Armenia is not sufficient to achieve these ambitious but reachable targets. According to the United Nations’ global e-government readiness reports for 2008, Armenia was ranked after 100 countries of the world, despite enjoying since 2007 a fully liberalized telecommunications sector, with three major competing mobile operators, numerous Internet Service Providers, and a number of new entrants. Substantial growth over the past four years in mobile penetration, which has now exceeded 100%, places Armenia in third place within the CIS, ahead of its sub-regional neighbors. However, the level of Internet penetration is still far from being satisfactory at around 6% of the population.

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1 World Development Indicators, The World Bank Group.
2 National Statistical Service of Armenia.
entire population in 2008, according to an EIF survey\(^6\), and broadband penetration of just around 1-2\% also in 2008\(^7\). In the regions, access to broadband communications is virtually non-existent, with a near monopoly in provision of backbone infrastructure outside of the 3-4 main urban centers.

6. The government is a major user of telecommunications services. The Ministry of Economy estimates central government alone spends somewhere between US$ 10 and 15 million annually. The government wishes to consolidate this spending by creating a government virtual private network that will at the same time save costs and increase the quality of telecommunications services provided to all public institutions, and become a key building block in the provision of a wide range of online government services to both citizens and businesses.

7. Another building block for Armenia’s e-society is the implementation of a secure electronic means of user identification for accessing both public and private e-services. Within this context, the GoA has placed the creation of a secure, efficient, and affordable electronic identification document system (e-ID) as a priority for the implementation of its e-society vision. Such a system would be used for provision of multiple government services, including the GoA’s pension reform program, e-health services, among many others, and will serve as the platform for the development of e-banking and other e-commerce services.

8. On the demand side, the level of personal computer (PC) penetration rates in Armenia is still low at 9.7 per 100 people\(^8\). However, the IT Sector Development Concept calls for over 70\% computer penetration at the household level by 2018, which would require at least 48,000 computers per year to be sold to households that do not already own one. Affordability of PCs is however an issue in Armenia due in part to the lack of affordable consumer credit and the lack of trade credit for importers. The GoA has therefore designed the “Computer for All” program to address the above issues by offering reduced pricing and financing schemes that would enable a larger number of Armenians to acquire computers.

9. With regards to the IT and knowledge-intensive industry, which is another key pillar of the GoA’s e-society vision, limited innovation in the private sector hinders economic diversification, industrial upgrading and access to global markets. Armenia’s worst rankings are on the Global Competitiveness Index (GCI) “innovation and sophistication factors” pillar (112 out of 133). Armenia shows limited ability to absorb, adapt and improve existing technologies. To compete on quality in global markets and attract FDI, Armenia needs a core base of domestic firms able to provide goods and services produced according to international standards.

10. Entrepreneurship trends in Armenia show potential for bringing new products and services to the market. In Armenia, in 2007, more firms were formed relative to the working age population than in the vast majority of countries at or below its PPP income level. The recent emergence of a dynamic IT industry in Armenia illustrates the country’s potential for knowledge-based diversification. Within the IT industry, the software and services segment is particularly

\(^6\) Current government estimates put the figure around 15\% by end 2009.
\(^7\) This number may have grown to around 8\% by end 2009, according to a TeleGeography survey.
\(^8\) 2010 The Little Data Book on Information and Communication Technology, The World Bank Group
dynamic, having grown at an average rate of 27 percent per annum from 2000 to 2009\(^9\). However, a weak enabling environment, lack of sufficient skills and knowhow, and the absence of public support instruments for innovation all constitute barriers to innovation, technology absorption and knowledge-based enterprise growth in Armenia.

11. Armenia’s support for innovation is limited to supporting public research institutions and an overall innovation policy is lacking. However, a major upcoming USAID technical assistance program is expected to include support to cover this gap in the near term, through one of its proposed pillars focused on innovation. A public institution created with support from a previous World Bank project, the Enterprise Incubator Foundation (EIF), provides financial support for innovation and incubation services, but due to its size, its impact is limited. Knowledge-intensive firms, including high tech and IT industries, are constrained by low access to credit and commercial investments due to disproportionately high transaction costs, longer time horizons and lack of tangible collateral. Armenia is short of appropriate financing mechanisms available to technology start-ups in the United States or Europe, such as venture funds and other institutional financial intermediaries focused on small and medium business financing. Thus, creation of new financing mechanisms customized to the needs of the Armenian technology companies becomes increasingly important for the further development and growth of the Armenian technology sector. Other major impediments to Armenian IT companies’ expansion include the limited scale of a qualified workforce, the low productivity of companies and the lack of formal standards for the IT industry.

12. The industry needs a number of supporting activities and programs targeted at increasing the supply of qualified technical and business graduates; improving the quality of education at Armenian universities; offering continuous educational and training mechanisms and facilities; improving business environment and communications infrastructure; shifting the industry’s focus towards higher value-added products and services; increasing size and sophistication of the domestic IT market; improving access to foreign markets; enhancing company productivity and product development skills; and others.

13. Within this context, it must be noted that relevant infrastructure for business incubation and industry development is almost non-existent in the regions. Gyumri, the second largest city of the Republic of Armenia, is far behind Yerevan when it comes to the availability of modern office space, communication infrastructure, training facilities, assistance to start-ups and training and advisory services for firms. However, Gyumri’s proximity to the border with Georgia, its short distance to the border with Turkey and its nascent cluster of technology-intensive firms active in various productive sectors, such as jewelry and fashion design, among others, provide some hope for regional economic development through intensive use of technology.

14. The GoA has developed a comprehensive regional economic development strategic framework for Gyumri. The objective of this strategy is to provide Gyumri firms and entrepreneurs with access to know-how, services and facilities which are currently unavailable in the Gyumri region, to provide technology upgrading support and incubation services to local firms and entrepreneurs as an important piece in the government’s strategy for regional economic development in the Gyumri marz. Current plans for the city encompass several

\(^9\) Ministry of Economy/EIF 2009 Armenian IT Industry Report.
interlinked elements, including establishing and following an urban development strategy, creating a special economic zone and fostering identified sectors with future growth potential, including a Technology Park. The first phase of this strategy calls for the creation of the Gyumri Technology Center (GTC), an enterprise incubator and technology extension center in downtown Gyumri, which will house business and SME upgrading program facilities aimed at supporting technology upgrading and fostering knowledge-based firms in the city. The GoA envisages that business incubators such as GTC could provide considerable support to local companies with a potential to contribute to the development of the Gyumri region.

Summary of major sector challenges which the project aims to address

15. The paragraphs below provide a summary of the main sector challenges which the project aims to address, as further identified in detail in Annex 1.

16. **Low level of Internet penetration**: Access to broadband is currently at an insufficient level to achieve the government’s aspirations of a modern Information Society. According to the UN’s global e-government readiness reports for 2004, 2005 and 2008, Armenia was ranked behind 100 countries on the communication infrastructure indicator. Insufficient international connectivity and frequent cable damages and service disruptions often result in considerable outages disrupting the country’s Internet connectivity for several days in a row. The overall quality of the retail Internet remains far from being satisfactory.

17. **Major inequalities in access to modern ICTs between the capital city and rural areas**: This issue is compounded by high prices for advanced services, notably broadband Internet, to a large extent due to the lack of competition in access to international telecommunication networks and a dearth of investment in domestic backbone networks. Although after the liberalization of the Armenian telecom market the cost of international connections has substantially decreased, it is still notably higher in comparison to that of connections in European and certain CIS countries. The retail monthly fee for unlimited Internet traffic of ADSL technology at the speed of 1 Mbps stood in 2008 at US$ 80 in Armenia, US$ 10 in Georgia, US$ 40 in Azerbaijan, and US$ 28 in Turkey.\footnote{Mediamax New Agency, July 6, 2009: Quoted from the report of the Armenian office of Academy for Educational Development (AED) and the United States Agency for International Development (USAID) on the Armenian telecommunications sector.}

18. **Lack of coordination of ICT development efforts**: As a result of the complexity of interactions between government entities, sometimes with overlapping responsibilities, and the cross-cutting nature of ICT, it is very difficult to coordinate the ICT-based development efforts in GoA, which leads to duplicating the investments and “stove-pipe” systems. This will present a major barrier to providing seamless e-services.

19. **Low level of PC penetration**: Current PC penetration in Armenia is 9.7 per 100 people and internet penetration is 6.2 per 100 people\footnote{Current government estimates put this figure at around US$ 40 per month.}, which is much lower than in other countries in the region that advocated and supported targeted ICT development programs such as Estonia (66.2
Further improvements in PC penetration and usage are critical for improving delivery of services to citizens, increasing productivity, and expanding access to enhanced educational opportunities.

20. **Unaffordable prices for even low-end PCs**: To acquire a low-end new desktop computer with a monitor in Armenia would require at least around $450 in cash. In 2008, the average monthly per capita income in Armenia was $78, which implies a monthly household income of $312 (assuming on average four people per household). With an investment cost higher than the average monthly household income, PCs are unaffordable for the local population. In addition, current bank rates for consumer loans are 20-24%, and require a large upfront cash payment of 30% or more, and thus consumers are reluctant to obtain a loan to finance the purchase of a computer. There is therefore a need to offer specific pricing and loan schemes that would enable a larger number of Armenians to acquire new and quality computers (including desktops, laptops, and other comparable access devices).

21. **Fast obsolescence of specialized skills and migration of young talent**: This issue is mostly due to the lack of modern training infrastructure and a stagnant market for re-skilling, which leads to a disconnect between the training provided and the demands of the industry.

22. **Weak local entrepreneurship**: This is in large part related to the absence of support structures, lack of value chains, and low appreciation for the value of intangibles (brand names, business reputation, marketing and managerial skills, networks, etc.), which hamper all high tech industries, including IT. Professional advice, certification, sales promotion, training, is essential for industry development.

23. **Low access to credit and commercial investments**: High tech and IT industries are most impacted by this constraint in access to credit due to disproportionately high transaction costs, longer time horizons and lack of tangible collateral.

24. **Lack of adequate infrastructure for business incubation in the regions**: The absence of incubation and industry development facilities outside of Yerevan is striking, notably in Gyumri, being the second largest city in the country. Quality office facilities with relevant services at reasonable prices are important elements for supporting the domestic industry. Professional advice, training, help with soft and hard technologies, marketing and fund raising are additional elements to help start-ups as well as existing companies.

25. In order to address some of the above challenges, the GoA requested support from the World Bank in the design and implementation of an E-Society and Innovation for Competitiveness (EIC) Project. A PHRD grant of close to US$1 million was secured to finance preparatory studies which have for the most part been completed. The PHRD grant includes studies in the areas of broadband backbone design, spectrum policy, e-ID card design, Computer for All support, design of Gymri Technology Center, design of Venture Fund, assistance for design of programs for IT industry development, economic analysis and M&E framework, among others.

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14 National Statistical Services of Armenia (NSSA).
B. Rationale for Bank involvement

26. The World Bank’s Country Partnership Strategy (CPS) for Armenia for 2009-2012, firmly grounded in Armenia’s Sustainable Development Program (SDP), identifies the following two key pillars: (i) Addressing Vulnerability, with the aim of mitigating the impact of the global economic crisis on Armenia and the most vulnerable population groups; and (ii) Promoting Competitiveness and Growth, with the objective of helping Armenia to position itself to take advantage of the recovery of the global economy and maintain high and sustained growth over the medium term. Further, the second pillar explicitly prioritizes support to Armenia’s transformation into a knowledge economy.

27. Within this context, the Armenia E-Society and Innovation for Competitiveness (EIC) Project is well positioned at supporting the second CPS pillar, while at the same time providing indirect support to the first pillar. Furthermore, the project is well aligned with the objectives of the series of Development Policy Operations currently under implementation, as a number of policy actions involve reforms in the telecommunications sector.

28. The World Bank is well positioned to play a crucial role in the area of information society and innovation based on the Bank’s experience worldwide in financing similar projects. Examples include broadband development and e-government projects in Africa (e.g. Regional Communications Infrastructure Program), Latin America (e.g. Nicaragua Rural Telecommunications Project), and South Asia (e.g. e-Lanka Project), among others. In the science, technology and innovation space, the World Bank is involved in multiple projects worldwide, from Korea and India in the nineties, to Turkey, Mexico, Croatia in recent years, to name a few.

29. The World Bank is also well positioned due to its prior involvement in the sector in Armenia. Notably, the Bank has been supporting Armenia’s liberalization efforts in the telecommunications sector from 2001 through a series of non-lending technical assistance activities and grants, and is currently involved in the e-government space through the Public Sector Modernization Project. In addition, the Bank supported from 2002 the implementation of the successful Enterprise Incubator LIL, which lays the foundation for much of the second component of this project.

C. Higher level objectives to which the project contributes

30. One of the higher level objectives of the Government of Armenia (GoA), as highlighted in Armenia’s Sustainable Development Program and the World Bank’s CPS is to promote competitiveness and growth.

31. The Armenia E-Society and Innovation for Competitiveness (EIC) Project aims at contributing to Armenia’s competitiveness by providing support for the implementation of the government’s vision towards an inclusive e-society, as outlined in the GoA’s Information Technology Sector Development Concept Paper (Annex to the RA Government Decree No. 35 dated August 28, 2008), which calls for a “sustainable information society with advanced ICT infrastructure and high level of computer and internet penetration accompanied by a large scale
digital literacy, extended use of e-services systems, and existence of large local IT market and progressive knowledge-based industry.”

32. The project contributes to promoting Armenia’s competitiveness by simultaneously addressing supply and demand constraints, providing support for two key pillars of the strategy, namely development of the broadband ICT infrastructure and enabling enterprise innovation on the basis of a competitive national IT/knowledge-intensive industry and an ICT-equipped and adequately skilled society, including citizens, businesses and government.

33. The components of this project are well aligned with the IT Sector Development Concept Paper and are expected to simultaneously contribute to government efficiency, transparency and citizen-centric service delivery, social inclusion and employment, effectiveness and growth of the local IT and high tech industries, and ultimately to overall economic competitiveness.

34. Higher level indicators that the project will monitor towards achieving this strategic objective include the following:

- Armenia’s ranking in WEF’s Global Competitiveness Report is increased
- Armenia’s ranking in UN’s E-government readiness index is improved
- Armenia’s ranking in WEF’s Global IT Report is increased

II. PROJECT DESCRIPTION

A. Lending instrument

35. The project is to be supported through a standard IBRD loan of US$ 24 million. The lending instrument used is a Specific Investment Loan (SIL). The government direct counterpart contribution is estimated at US$ 6 million, calculated as the tax obligations due over the life of the project. In addition, the GoA expects to allocate close to US$ 2 million to contribute towards complementary activities under sub-component 2.2, Establishment of Gyumri Technology Center, as well as close to US$ 7 million to contribute towards sub-component 1.2, Digital Citizen, in particular for the roll-out of the e-ID cards and biometric passports.

B. Project development objective and key indicators

36. The Project Development Objective (PDO) is to address constraints to competitive e-Society\(^1\) and enterprise innovation in Armenia by strengthening the underlying infrastructure and enabling environment.

37. To measure the progress toward achieving the project development objective and outcomes, and ultimately towards the government’s higher level objectives of addressing constraints to competitiveness of the economy by promoting innovation and the development of an ICT-

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\(^{1}\) E-Society in the context of this project is defined as society with a greater access to ICTs (computers, broadband), improved enterprise level ICT skills, growing and more competitive local knowledge and technology intensive industry.
enabled Society (e-Society) in Armenia, a number of PDO level indicators were defined\textsuperscript{16}, as further explained in Annex 3:

- Access to internet services (% population using Internet)
- Access to computers (% population using a computer)
- Development of Knowledge and Technology intensive industries (ratio of IT/ITES Sector\textsuperscript{17} revenue in GDP)
- IT/ITES Employment (number of people)

38. In addition, for each of the sub-components a number of individual intermediate outcome indicators were identified, as further described in Annex 3, which also details specific variables, baselines and target values. It must be noted that the PDO indicators will require household and enterprise surveys, and hence it is expected that they will be reported three times during the life of the project: at project start, at mid-term and at project end. All other indicators will be collected more frequently, mostly on an annual basis. In addition, an independent impact evaluation will be conducted.

39. Finally, a number of output indicators were identified to keep track of the individual activities. The comprehensive list of output indicators is contained in the detailed M&E report prepared under the PHRD grant and available in the project files. The participating agencies will keep track of output indicators associated with their particular activities, and will report on them to the World Bank ahead of every supervision mission, alongside the applicable intermediate and PDO outcome indicators, to assist in assessing progress towards meeting the PDO.

C. Project components

40. The paragraphs below summarize the various project components and sub-components. More details on specific activities included within each sub-component can be found in Annex 4. The amounts indicated include only the IBRD financing portion. GoA co-financing has been estimated at 25\% of the indicated amounts and represents the estimated taxes involved. Additional GoA co-financing is also expected for a number of activities, as highlighted above, notably for Gyumri Technology Center and Digital Citizen. It must be noted that the GoA has requested and obtained a Project Preparation Advance (PPA) to complement the PHRD grant and advance limited project implementation in a number of priority areas, notably the Digital Citizen and Computer for All programs, under sub-components 1.2 and 1.3, respectively. The PPA also includes some of the technical assistance described below for subcomponent 1.1 and for component 2.

\textbf{Component 1: E-Society Infrastructure Development (US$ 12.7 million)}

41. The objective of this component is to increase access to affordable broadband services for citizens, businesses and public institutions, to equip citizens and businesses with a tool for authentication for electronic transactions and to increase access to affordable computers, content

\textsuperscript{16} To the extent feasible, a subset of these indicators will be gender-disaggregated.
\textsuperscript{17} IT services, Software, ISPs and engineering services.
and e-services for citizens. This component will focus on e-society infrastructure development by financing activities under the following three sub-components including sub-project:

42. Sub-component 1.1: Nationwide Broadband Backbone and Government Network (US$ 7.9 mln). The objective of this sub-component is to support the development of a world class private sector-led competitive ICT infrastructure serving major regions, communities, government and local self-government bodies and private industry in Armenia. Specifically, this sub-component will provide financing for: (i) technical assistance for regulatory framework and backbone implementation; and (ii) the government contribution towards the deployment on a Public Private Partnership (PPP) basis of a nationwide broadband backbone network, operated and managed by the private sector, which will facilitate broadband access throughout the country, with adequate international linkages, as well as with the necessary connections for public institutions throughout the country (government virtual private network), i.e. government agencies, schools and health care facilities. The PPPs will be implemented on the basis of performance-based contracts, following output-based aid (OBA) approaches, whereby funds are disbursed on the basis of construction and service delivery milestones explicitly specified in the contract, and confirmed by an independent third party verification agent prior to disbursement.

43. Sub-component 1.2: Support to Digital Citizen Program (US$ 1.3 mln). The main objective of this sub-component is to enhance trust and security in the provision of electronic services and hence promote further uptake of electronic services by citizens and businesses. This will be achieved through support to the creation of a national certification authority for electronic signatures, to be established on the basis of the Ministry of Economy’s E-Governance Infrastructure Project Implementation Unit (EKE NG). The use of electronic signatures will provide citizens and businesses with a tool for electronic authentication for on-line transactions. In addition, the government plans on further extending the use of electronic signatures through a parallel initiative funded from GoA own resources to develop and distribute electronic identification cards and biometric passports (e-ID documents), which will contain electronic signatures embedded in them, while at the same time explore innovative approaches like mobile ID solutions. Specifically, this sub-component will support: (i) technical assistance to support the establishment of the Certification Authority and technical assistance for independent testing and verification of the e-ID document system to be implemented by the GoA on a PPP basis; and (ii) information technology goods and services on the basis of a turnkey contract for establishing the Certification Authority.

44. Sub-component 1.3: Computer for All Program (US$ 3.5 mln). The overall objective of this sub-component is to increase computer usage in Armenia by offering to the population modern computers equipped with software and content at affordable prices. The target of the program is to reach purchase rates of at least 10,000 computers per year. The program will be implemented through a PPP between the Government of Armenia, Enterprise Incubator Foundation, commercial banks, technology vendors, and their local distributors and retailers, and will remain open to other vendors and service providers, including telecommunications operators. Specifically, this sub-component will finance: (i) line of credit (LOC) to small borrowers, in particular, local wholesale distributors and end consumers, through private financial institutions (PFIs) acting as financial intermediaries as per the guidelines of OP 8.30, para. 19; and (ii) technical assistance to implement the Computer for All Program.
45. The flow of funds, eligible expenditures, eligibility criteria for PFIs, vendors, and other participants, terms and conditions of the loans, and other aspects of the program are described in Annex 4 and in full detail in the Computer for All Operational Manual. The Line of Credit will constitute the government’s contribution to the PPP Computer for All program, and the private contribution will be made by participating PFIs on a 50/50 basis. Participating PFIs will pre-finance the Program through two vehicles: a) providing commercial loans to wholesale computer distributors (logistic centers) for the purchase of eligible goods (as defined below) in bulk for further resale through participating retailers, to ensure economies of scale and lower prices; and b) providing consumer credit to individuals for the purchase of eligible goods (using the same definition) through participating retailers. The eligible goods will constitute desktop or laptop computers, and related information technology equipment, bundled with other products and services such as software, content, internet access, and training tutorials. PFIs will be reimbursed for actual loans and eligible goods sold on a monthly basis.

Component 2: Fostering Enterprise Innovation (US$ 10.2 mln)

46. The objective of this component is to promote the creation, growth and competitiveness of knowledge and technology-driven enterprises18, while at the same time encouraging traditional sectors to adopt new technologies. This component will focus on supporting programs, financial mechanisms and infrastructure that will create a favorable enabling environment for knowledge and technology-driven companies, by financing activities under the following three sub-components:

47. Sub-component 2.1: Financial Support for Innovation in Knowledge and Technology-intensive Firms (US$ 4.70 mln). The objective of this sub-component is to stimulate the rate of technology absorption, technology transfer, innovation and commercialization in the private sector, foster collaboration between research and industry, and promote the development of new knowledge- and technology-driven companies across Armenia, including a regional innovation promotion emphasis in the Gyumri region. Specifically, this sub-component will finance: (i) Ideas generation mini grants ($2-10 k) for business plan and proof of concepts for innovative ideas, and innovation matching grants for product or process adaptation, improvement and development ($10-150k); (ii) public contribution towards establishing a Seed and Early Stage Venture Fund, including management team remuneration; and (iii) establishing an Innovation Brokerage Team.

48. Both kinds of Grants will be managed as a single program with different beneficiary eligibility criteria, maximum size of grants and eligible expenditures, as described in the Grants Grant Operational Manual. In both cases, eligible expenditures will be goods and services, as further described in the Operational Manual. No works will be financed through the grants. Subprojects financed by these Grants will be selected on the basis of competitive calls for proposals. In the case of innovation matching grants, the beneficiaries will be expected to match

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18 Knowledge and technology-driven enterprises include technology-based firms (e.g. IT firms), as well as firms that compete on the basis of product, process or service innovation. Innovation can be either incremental or radical, and either new to the Armenian market or new to the world.
the Grants with an equal amount of resources from their own resources. Any advanced funds not invested in subprojects prior to the closing of the project would be returned to the World Bank.

49. The Seed and Early Stage Venture Fund will be implemented as financial intermediary loan mechanism, where the loans will be extended by the Venture Fund for long term financing of eligible goods and services. No works will be financed through the Venture Fund. The Venture Fund will be established as an independent legal entity, managed by a professional private fund manager selected competitively. Once the disbursement condition for this activity is met, i.e., the Fund is established and fund manager selected, with by-laws and selection process acceptable to the Bank, respectively, and private investors have committed resources to the Fund, the Bank may advance up to $1 million to the Fund Account. The funds advanced to the VC Fund will be considered eligible expenditures once the VC Fund invests them in subprojects for eligible expenditures, as reported in the VC Fund’s annual external audit. Any advanced funds not invested in subprojects prior to the closing of the project would be returned to the World Bank. The full description of Fund governance, eligible subprojects and expenditures, and flow of funds will be further defined in the Seed and Early Stage Venture Fund Operational Manual.

50. Sub-component 2.2: Establishment of Gyumri Technology Center (US$ 2.90 mln). The objective of this sub-component is to provide Gyumri firms and entrepreneurs with access to know-how, services and facilities which are currently unavailable in the Gyumri region. This sub-component will provide support for firms (both existing and start-ups) with potential to grow and compete initially in local and eventually in international markets on the basis of technological upgrading. This will be achieved by facilitating firms’ access to knowledge and supportive technology infrastructure. Specifically, this sub-component will finance works, goods and consulting services for the establishment of a technology center in Gyumri, in an existing GoA-owned building, to provide technology support and incubation services to local firms and entrepreneurs as an important piece in the government’s strategy for regional economic development in the Gyumri marz.

51. Sub-component 2.3: Support to IT/Knowledge-intensive Industry Development (US$ 2.60 mln). The objective of this sub-component is to enhance the technological absorptive capacity and innovation in existing firms and the growth of knowledge and technology-driven firms. The sub-component will promote enterprise-led innovation by supporting skills and technology development, and firms’ linkages with demanding international markets and Armenian research capabilities. Specifically, this sub-component will: (i) promote international sales and foreign direct investment, through the establishment of an Armenian IT Sales Force Representation Office in Silicon Valley and managerial secondments; and (ii) facilitate access to know-how and new technologies and promote productivity improvements, through technical assistance and training for skills development and certification.

Component 3: Project Management (US$ 1.1 mln)

52. This component will finance necessary activities for adequate project management, including monitoring and evaluation, and PR communications campaigns. Specifically, it will support technical assistance, capacity building and incremental operating costs, including travel, as needed for project management, for EKENG, EIF, NCFA, as well as FFPMC. This component
will also support the establishment of a regularly updated monitoring and evaluation system (preferably on a web-based platform) and will finance project audits, as well as any necessary beneficiary audits as per the Project Implementation Plan.

**D. Lessons learned and reflected in the project design**

53. *Lessons from in-country experience.* The project builds on the lessons from recent analytical work and operations in Armenia. In particular, a Country Procurement Assessment Review (CPAR) done in 2009 concluded that public procurement environment is in mid to high risk category. The 2005 Country Financial Accountability Assessment (CFAA) report concluded that the overall fiduciary risk in Armenia is significant. Similarly, the PEFA assessment report published in October 2008 also found that several critical Public Financial Management (PFM) elements including internal controls, internal and external audit, and financial reporting are still weak. Given this environment, reliance on country systems was not an option and the lowest risk alternative was to use FFPMC to take care of fiduciary aspects, as it has proven that it has the capacity to minimize fiduciary risk.

54. The successful implementation of the Enterprise Incubator LIL several years back, as well as the current progress under the Access to Finance for SMEs Credit Line Project and the Public Sector Modernization Project, provide a number of lessons related respectively to: (i) implementation of innovative schemes to promote the growth of the IT/Knowledge-intensive industry; (ii) financial intermediary approaches that channel World Bank financing through commercial banks, and mechanisms for selecting participating banks; and (iii) implementation of complex IT systems in public sector institutions. Lessons in all these areas are incorporated in the design of the project, and will be reflected in operational manuals, pre-qualification criteria, bidding documents, etc. that will be used for this project.

55. Lessons were also learned during project preparation, in particular with regards to the Computer for All Program thanks to the deployment of a limited scale pilot project that allowed for the fine-tuning of the design, as further described in Annex 4.

56. *Lessons from international experience.* The project design also reflects lessons learned from projects with similar components implemented with World Bank support in many countries around the world. The following is just a summary of such lessons.

57. **PPP arrangements.** Given innovative approaches being proposed by the GoA for implementation of a number of PPPs under the project, it is important to build sufficient time into the implementation timeline to develop well-structured bidding documents that will be acceptable to the private participants and also to the World Bank, in accordance with the Bank’s procurement guidelines. The team has already held discussions on salient aspects of these PPP arrangements with the Regional Procurement Manager.

58. Related to the above, it must be noted that PPP bidding processes tend to be lengthier than regular goods procurement processes, given that they imply a transfer of risk to the private participant including financial risk. In addition, given the number of design variables that
typically need to be tested with the market, a two stage bidding process may sometimes be required, lengthening the process even further.

59. **Broadband backbone deployment.** A number of alternative models for broadband backbone deployment have already been tested through various World Bank projects. While there is no one-size fits all approach, three options seem to work well, not all of which are mutually exclusive: (i) a cooperative approach, where all existing network operators agree to participate in a consortium to finance and manage the backbone network, with or without government equity participation; (ii) a competitive approach, where the government launches a “reverse-subsidy” auction on an Output-Based Aid (OBA) approach and awards the contract to the lowest responsive bidder, with careful consideration for competitive safeguards built into the contract; (iii) a combination of one of the two previous approaches with government commitment to pre-purchase in bulk capacity on the backbone network for a specified period of time. The current project design combines options (ii) and (iii).

60. **Venture Fund implementation and linkage with National Innovation Systems.** Numerous World Bank science, technology and innovation (STI) projects include some form of Venture Fund. Lessons from early projects in Korea and India, as well as more recent projects in Turkey, Mexico, Croatia, among others, point to the following: (i) need to ensure that the management of the Venture Fund is private and the majority of funding is also private; (ii) focus of public sector support to Venture Funds should be on the early stage, to support start-ups and SMEs to grow to a point where they can access commercial equity finance; (iii) financial support through Venture Funds is particularly crucial for knowledge-intensive firms, such as those in the IT sector, where the assets are mostly intellectual and hence collateral appears to be non-existent due to its intangible nature; (iv) Venture Funds are part of a broader ecosystem, the National Innovation System (NIS), and can be used as tools to enhance linkage between R&D institutions and private industry, increase private sector spending on R&D and ultimately shift from purely public institutions to public-private institutions as pillars of the NIS.

E. **Alternatives considered and reasons for rejection**

61. A number of alternative designs for the project were considered and rejected. Below are some of the key design decisions that were made when preparing the project, some relating to the project as a whole, while others relate to specific components, sub-components or activities.

62. **Alternative 1: two projects or one project.** The World Bank and the GoA evaluated the option of separating both components into two independent projects. This option was rejected due to the potentially small size of both projects and additional overhead that would have been implied in the two project solution. In addition, the synergies between both components could have been somewhat lost. Finally, given that both components have the same ultimate client and include many of the same participating agencies, the burden on the client may have been too high, having to prepare two projects in parallel and coordinate with two separate Bank teams.

63. **Alternative 2: all-inclusive e-society project versus building block approach.** The WB-GoA project team evaluated the opportunity of designing a full-fledged e-society project, which would not only include infrastructure elements, but also a large number of e-services and
applications. This overly complex option was rejected in favor of a smaller catalytic project that would lay the foundation for e-society without attempting to solve all the problems at once. It is expected that other parallel operations, notably in the areas of public sector modernization, pension reform, education, among others, will develop the end-user e-services and would take advantage of the building blocks established under the EIC project.

64. Alternative 3: broadband backbone and government network alternative options. In addition to the packaged single bidding process approach that the GoA has selected, three alternative options for the deployment of the broadband backbone and government network were analyzed and rejected:

(a) The first one relates to the deployment of a totally separate physical government network, independent of any private sector player. This was considered too costly and hardly justifiable on the basis of public sector demand alone.

(b) The second one relates to the deployment in two successive bidding processes of the backbone network first and the government network second. This approach was rejected due to the extensive delays implicit in this option, as well as the lower degree of certainty provided to private sector providers of backbone services if the public sector demand is not guaranteed upfront.

(c) The third alternative option relates to the establishment of a consortium of all existing network operators in Armenia to deploy cooperatively the backbone network and compete exclusively on the basis of services and last mile access. Due consideration was given to this option, however the general feeling within the GoA is that the transaction costs implied with bringing all the players around the table may outweigh the benefits and may end up becoming a costly option in terms of lengthy delays.

65. Alternative 4: e-ID documents alternative options. In addition to the selected PPP option the government considered two alternative scenarios for e-ID documents implementation in the country:

(a) Financing fully from the Treasury and the World Bank. This option would have implied the GoA would bear the full cost of system implementation. Given the limited availability of funds and the overall government inclination towards involving private sector participation, this option was considered not feasible.

(b) Selecting a consulting company (based on a Success Fee) to attract a private sector investor to fully finance the system. While this option may ultimately be implemented in the future, the GoA considered that it was too risky at this point given uncertain demand for e-ID documents, and might also prove too lengthy (it would imply two successive bidding processes), thus unacceptable given the government’s urgent obligation to implement biometric passports.

66. Alternative 5: Computer for All alternative options. Various alternative models were evaluated for the implementation of the Computer for All Program, including a fully
government-funded option, which was early on discarded, as it is contrary to the project’s general PPP philosophy.

67. **Alternative 6: Implement tax incentives/matching grant programs for lab or other equipment.** This option would have implied a larger matching grant program than the one foreseen in the project and may have invested in physical facilities instead of in intellectual capital. This was seen as less strategic for a small catalytic operation as this one and less aligned with the project’s focus on innovation.

68. **Alternative 7: Venture Fund alternative options.** Various alternative models were considered for the venture fund, including the possibility of an equity fund that would finance the growth of already established firms or a deal-by-deal approach without the creation of a fund. The first approach was rejected as it was considered that this could be financed purely on a commercial basis, and there are indeed indications that investors, such as the Russian Sitronics, that may be willing to invest without necessarily requiring government participation. The second alternative was rejected as it would have implied a very ad-hoc and difficult to manage approach, with obvious implied risks.

### III. IMPLEMENTATION

#### A. Institutional and implementation arrangements

69. Responsibility for the project lies fully in the Ministry of Economy, which will have the overall project coordination role. High-level management of the project will be carried out by a Project Steering Committee (PSC), set up in accordance with the requirements of Government Decree 765\(^{19}\) (Credit Governance Board), chaired by the Minister of Economy with right of veto, and with representation of several key participating institutions: Ministry of Economy, the Ministry of Finance, the Ministry of Transport and Communications (MTC), the Public Services Regulatory Commission (PSRC), the Foreign Financed Projects Management Center (FFPMC), the Enterprise Incubator Foundation (EIF), the National Competitiveness Foundation of Armenia (NCFA), the E-Governance Infrastructure Project Implementation Unit OJSC (EKENG).

70. Day-to-day management of specific activities under the project would be assured by EIF, NCFA and EKENG, alongside FFPMC, which will manage the fiduciary aspects of the project. The diagram below shows the respective responsibilities of the participating agencies.

71. Additional details on project institutional and implementation arrangements are provided in Annex 6.

72. **Financial management capacity.** FFPMC successfully implements the Public Sector Modernization Project (PSMP) and Social Protection Administration Project (SPAP) as well as several small stand alone grants. There were no weaknesses in the financial management arrangements at FFPMC. However, the fund flow and controls arrangements under various

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\(^{19}\) Republic of Armenia Government Decree No. 765, December 22, 1999 on Activities Implemented on the Account of Credit and Grant Proceeds, Allocated to the Republic of Armenia by Overseas Countries and International Credit Organizations.
subcomponents of the project will need to be described in the respective operational manuals. FFPMC has adequate Financial Management Manual (FMM) which will be updated prior to the project implementation to reflect the activities of EIC project. The controls over funds flow in relation to (i) activity 1.1.2, Nationwide Broadband Backbone Network, will be described in the Broadband Networks Operational Manual acceptable to the Bank; (ii) activity 1.3.1, Line of Credit for the Computer for All Program, will be described in the Computer for All Operational Manual acceptable to the Bank; (iii) activity 2.1.1, Ideas Generation Grants and Innovation Matching Grants, in the Grants Operational Manual acceptable to the Bank; and (iv) activity 2.1.2, Seed and Early-Stage Venture Fund, in the Seed and Early Stage Venture Fund Operational Manual acceptable to the Bank.

73. **Technical and managerial capacity.** The capacity of EIF, EKENG and FFPMC were also assessed by the Bank team. All three institutions are well staffed: EIF has 11 professional staff, EKENG also has 11 staff and NCFA has 35 staff, though only two are participating in the project. All three institutions have well established managerial practices and procedures. Staff has relevant qualifications for managing current tasks, but the capacity assessment has revealed the need to strengthen that capacity in order to implement the EIC project. The team has discussed and agreed with the three institutions the need to acquire additional resources through selection of consultants under the project, which have already been included in the project budget and procurement plan. In particular, EIF will require a team of about 10 to manage the Computer for All program, and another 8 consultants to manage the other activities under EIF (Venture Fund, brokerage team, sales office, skills development, among others). EKENG will require 3 new specialized staff to manage security, software development and legal aspects of the program. NCFA will require an additional 4 staff to manage the broadband component, including project manager and assistant manager, telecommunications expert and legal expert.
B. Monitoring and evaluation of outcomes/results

74. Monitoring and Evaluation (M&E) of project components, sub-components and activities will be a streamlined, integrated aspect of project implementation and management. Primary responsibility for results monitoring will fall on NCFA, EKENG, EIF, with the support of FFPMC.

75. The following arrangements are made for this project (more details can be found in Annex 3):

- The full M&E results framework will be finalized with the support of a study being financed under the PHRD grant.
- An M&E training will be conducted by experts of the World Bank for the responsible agencies and their M&E delegates at the time of project launch. The training will cover the basics of (a) monitoring and evaluation frameworks, (b) different types of indicators, including impact and outcome indicators, (c) collection efforts, (d) reporting requirements for the World Bank project.
- Data collection and reporting will be the ultimate responsibility of EIF, NCFA and EKENG with the support of FFPMC.
- The Ministry of Economy will provide the World Bank with a comprehensive M&E report ahead of every supervision mission, at least semi-annually, showing progress towards project outcomes.
- Data collection and reporting should be automated where possible, and be written into the TORs and technical specifications of systems or applications to be implemented by a vendor.
- Survey-based collection of results data will be included under the project.
- The mid-term project review may offer the opportunity to amend the indicator series, or target values based on evolving circumstances.

C. Sustainability

76. The risk of the project not being sustainable is small. The development of ICT industry is identified as a priority area for the GoA, as per the Information Technology Sector Development Concept Paper which aims at a “sustainable information society with advanced ICT infrastructure, high-level computer literacy, high level of computer saturation and Internet access, extended use of e-services systems, existence of large local IT market and progressive knowledge-based industry.” Sustainability is at the core of this concept.

77. As a result of the project, the enabling environment and underlying infrastructure for e-society and innovation will be modernized, and the capacity of the participating institutions will be increased. Thus, the GoA should expect higher fiscal revenues from the ICT sector and technology-intensive industry as it grows, and lower fiscal expenditures on ICT services in part due to the implementation of a government private virtual network.

78. Underlying the whole project design is a philosophy to leverage private investment through PPPs. Sustainability of the project results will be therefore enhanced through private investment
and management of the facilities established under the project and progressive withdrawal of public sector participation and financing. This PPP approach, once evaluated, could eventually be extended to other sectors of the economy.

D. Critical risks and possible controversial aspects

79. According to the recent Transparency International’s Corruption Perception Index 2009 Armenia was ranked 120 in the list of 180 countries. Adequate mitigation measures are incorporated in the project, and the Bank staff will closely monitor performance during implementation. The country risk is significant and the residual risk after mitigation is assessed to be moderate.

80. The overall risk of the operation is rated as moderate to substantial under the traditional risk ratings. The project team prepared a risk assessment matrix following the guidelines of the new Operational Risk Assessment Framework (ORAF) and the overall project risk has been rated as medium driven by likelihood.

81. The table below summarizes the key project risks identified under the ORAF matrix, including proposed risk ratings before mitigation measures.

<table>
<thead>
<tr>
<th>Risk Category</th>
<th>Risk Rating</th>
<th>Risk Description</th>
<th>Status</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Project Stakeholder Risks</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1.1 Stakeholder</td>
<td>M-I</td>
<td>Inadequate political support to the project due to changes in leadership.</td>
<td>O</td>
</tr>
<tr>
<td>2. Operating Environment Risks</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2.1 Country</td>
<td>M-I</td>
<td>Financial and economic growth does not improve as expected</td>
<td>O</td>
</tr>
<tr>
<td>2.2 Institutional Risk (sector &amp; multi-sector Level)</td>
<td>M-L</td>
<td>Macroeconomic vulnerabilities and lack of a central focal point in charge of ICT sector policy could lead to a reduction in public and private investment in innovation and ICT.</td>
<td>NYD</td>
</tr>
<tr>
<td>3. Implementing Agency Risks (including FM &amp; PR Risks)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3.1 Capacity</td>
<td>M-L</td>
<td>Inadequate capacity in FFPMC, EIF, NCFA and EKENG to manage high volume and complexity of procurement packages leads to</td>
<td>NYD</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>3.2 Governance</th>
<th>M-L</th>
<th>Split implementation responsibilities between the participating agencies could introduce delays in implementation.</th>
<th>0</th>
</tr>
</thead>
<tbody>
<tr>
<td>3.3 Fraud &amp; Corruption</td>
<td>M-L</td>
<td>Political interference or pressure from special interest groups leads to controversy about transparency of project implementation.</td>
<td>0</td>
</tr>
</tbody>
</table>

### 4. Project Risks

| 4.1 Design | M-I | Relatively modest resources to implement the project and high client expectations for the project leave little margin for error. | 0 |
| 4.2 Social & Environmental | M-L | Negative environmental effects, notably from the roll-out of broadband communications infrastructure. | 0 |
| 4.3 Program & Donor | Low | While there are no donors currently directly co-financing the project, should donor assistance materialize, coordination will need to be assured. | NYD |
| 4.4 Delivery Quality | M-L | Project effectiveness reduced due to improper sequencing and lack of change management. | 0 |
| 4.5 Other (max 2) | M-L | Insufficient demand for facilities built and businesses created through the project could minimize development impact. | NYD |

H= High, M-I=Medium driven by Impact, M-L= Medium driven by Likelihood, L=Low.

### E. Loan/credit conditions and covenants

82. There are no additional project effectiveness conditions. The Borrower shall maintain or cause to be maintained a financial management system in accordance with the provisions of Section 5.09 of the General Conditions. The Borrower shall prepare and furnish to the Bank not later than forty five days after the end of each calendar quarter, interim unaudited financial reports for the Project covering the quarter, in form and substance satisfactory to the Bank. The Borrower shall have its Financial Statements audited in accordance with the provisions of Section 5.09 (b) of the General Conditions. Each audit of the Financial Statements shall cover the period of one fiscal year of the Borrower. The audited Financial Statements for each such period shall be (i) furnished to the Bank not later than six months after the end of such period and (ii) made publicly available in a timely fashion and in a manner acceptable to the World Bank.

83. The Borrower through FFPMC, shall one year after the first deposit into the Venture Fund commercial account mentioned is made either by the Venture Fund or the private investors, and every year thereafter, cause the Venture Fund to carry out an annual independent external audit.
in accordance with consistently applied auditing standards and auditors acceptable to the Bank, with respect to the Venture Fund financial statements in order to ensure the proper use of loan proceeds. The audited Venture Fund Financial Statements for each such period shall be (i) furnished to the Bank not later than six months after the end of such period; and (ii) made publicly available in a timely fashion and in a manner acceptable to the Bank.

84. **Loan Disbursement Conditions.** The project will have five disbursement conditions: a) in relation to activity 1.1.2, Nationwide Broadband Backbone and Government Network, the Borrower has signed a Subsidiary Finance Agreement with NCFA and approved a Broadband Networks Operational Manual, both acceptable to the Bank, and the relevant Beneficiary has met the criteria set forth in said Manual; b) in relation to activity 1.3.1, Line of Credit for the Computer for All Program, the Borrower has signed a Subsidiary Finance Agreement with PFI(s) and has approved a Computer for All Operational Manual, both acceptable to the Bank, has selected Vendor(s) in accordance with the procedures established in said Manual, and the relevant Beneficiary has met the criteria set forth in said Manual; c) in relation to activity 2.1.1, Ideas Generation Grants and Innovation Matching Grants, the Borrower has signed a Subsidiary Finance Agreement with EIF and has approved a Grants Operational Manual, both acceptable to the Bank, and the relevant Beneficiary has met the criteria set forth in said Manual; d) in relation to activity 2.1.2, Seed and Early-Stage Venture Fund, the Borrower has signed a Subsidiary Finance Agreement with the Venture Fund and adopted a Seed and Early-Stage Venture Fund Operational Manual, both acceptable to the Bank, has selected competitively a private manager for the Fund, has adopted the draft by-laws, investment guidelines, and has otherwise complied with all the obligations indicated in the Loan Agreement, the Fund has been incorporated, and the private investors have committed resources to the Fund; and e) in relation to activity 2.3.1., Industry Promotion and Managerial Secondments, the Borrower has selected competitively a professional management company for the Sales Force Representation Office in Silicon Valley and a Sales Force Representation Office Operational Manual acceptable to the Bank has been adopted. In relation to the latter, a dated covenant has also been established to ensure that within one year from the establishment of the office at least one private partner has committed resources to co-finance the office.

85. Regarding the first disbursement condition, it must be noted that an advanced draft Operational Manual for the Computer for All Program has been prepared by the client and shared with the Bank. Regarding the other four conditions, the respective operational manuals and/or required implementation instruments have not yet been presented for review by the Bank, but work on preparing them is ongoing with support from the PHRD grant.

IV. **APPRAISAL SUMMARY**

A. **Economic and financial analyses**

86. A detailed economic and social impact analysis was conducted with the support of the PHRD grant, and its results are summarized in Annex 9.

87. The long list of impacts anticipated from the project can be grouped in three key areas: (i) a dramatic increase in usage of modern ICTs by the Armenian population, notably through broadband internet, computers and secure e-services; (ii) substantial improvement in public
sector access to ICTs, fiscal savings through the deployment and use of the government virtual private network and added fiscal revenues through the overall growth of the ICT sector; and (iii) a significant increase in the size of the technology-intensive sector in Armenia, with particular impact on economic diversification and GDP growth, export revenues, competitiveness, worker skills levels and employment opportunities.

88. In conclusion, it is expected that the project is potentially laying the foundation for increased opportunities in R&D, investment and employment in the economy. It also potentially triggers increased production and increased volume of exports. In the long-term the aforementioned leads to GDP growth and overall competitiveness increase. The two components of the Project create additional synergy through inter-linkages and inter-related activities and impacts. The project will have more significant positive impacts in the long-run rather than in the short-run, in line with its objective to create a truly knowledge-based economy.

B. Technical

89. No major technical issues or obstacles are anticipated in the project. However, the project will benefit from fast technological development in the ICT sector. The latest technologies will be applied when feasible, allowing cost reductions and greater affordability for the users. Given that the majority of the project will be implemented through PPPs, technical obsolescence risk will be largely passed on to the private contractor. Hence, emphasis will be placed on monitoring adequate compliance of private providers with the terms and conditions of the respective bidding documents and contracts.

90. In the particular case of the broadband component, it is expected that the PPP will entail competitive awards of funding through performance-based contracts (output-based aid or similar arrangements) to private-sector operators that would be responsible for installing, operating, and maintaining the new telecommunications infrastructure to be deployed. These tenders will be technologically neutral where possible and this will guarantee that the best broadband technologies available will be used.

91. The only other area of potential concern from a technical perspective relates to the design, implementation, operation and maintenance of complex ICT systems to be implemented through the project, notably the Digital Citizen initiative, aimed at implementing an e-ID documents system. The World Bank team harbors some concerns with regards to the adequacy of GoA’s choice for PKI technology, which may end up being too expensive for the purposes intended. Through careful drafting of bidding documents, the team will continue to ensure that technology choices remain open. Substantial work has already taken place in preparing the technical specifications and bidding documents ahead of project appraisal and the team has worked in close cooperation with the client to minimize the risks of potential delays, cost overruns or performance mismatch in the implementation of the systems.

C. Fiduciary

92. Financial Management. FFPMC will be responsible for implementation of the financial management (FM) function of the project, including the flow of funds, planning and budgeting,
accounting, financial reporting, internal controls and auditing. FFPMC successfully implements the PSMP and the SPAP projects as well as a number of standalone grants.

93. **Fiduciary Risk at the Project Level.** The FM arrangements of FFPMC have been reviewed as part of the active projects supervision and have been found highly satisfactory. An assessment of the FM arrangements for the project was undertaken in September 2010. As a result, it was established that FFPMC has acceptable FM arrangements in place: (i) accounting and reporting is performed in 1C accounting software; (ii) the filing system is well systematized; (iii) the FFPMC’s FM staff has extensive experience in Bank procedures for disbursement and financial management, including Interim Un-audited Financial Reports (IFRs) preparation; (iv) internal control system is sound; (v) the FM rating was consistently highly satisfactory for the past several years; and (vi) annual audits of the on-going PSMP and SPAP projects were conducted on time with unqualified (clean) opinions and no issues were raised by the auditor in the management letters. The annual audits of the project and VF financial statements will be provided to the Bank within six months of the end of each fiscal year as well as at the closing of the project. The Borrower has agreed that it will publish (posting on MOE website) the audit reports of the project and the entity within two weeks after receipt.

94. As the project will be implemented in an environment where corruption can be perceived as an important issue, adequate mitigation measures have been put in place and will be closely monitored to ensure that the residual project risk is acceptable, including: (a) a formal internal control framework described in the Project Implementation Plan (including Project Operations Manual), Broadband Networks Operational Manual, Computer for All Operational Manual, Grants Operational Manual and Seed and Early Stage Venture Fund Operational Manual; (b) the flow of funds mechanism agreed with the Borrower will be enforced; (c) the project and VF financial statements will be audited by independent auditors and on terms of reference acceptable to the Bank; and (d) regular FM implementation support and supervision and procurement prior and post reviews will be conducted to monitor and assess the corruption risk.

95. The overall FM risk for the project before mitigation measures is substantial and after mitigation measures, the risk is moderate.

96. **Fiduciary Risk at the Country Level.** According to the latest Doing Business Survey 2010, Armenia was among the top-rated CIS countries and scored well vis-à-vis many other developed and developing countries (43th out of 183). At the same time, the latest Transparency International’s Corruption Perception Index 2009, indicating the perceived level of public-sector corruption, ranked Armenia 120 in the list of 180 countries. A Country Procurement Assessment Review (CPAR) done in 2009 also concluded that public procurement environment is in mid to high risk category. The 2005 Country Financial Accountability Assessment (CFAA) report concluded that the overall fiduciary risk in Armenia is significant. The key reasons are: (i) inadequate capacity of core control and supervisory agencies performing the audits within the public sector; and (ii) although most of the basic laws are in place with respect to various entities’ (private sector and public enterprises, including state non-commercial organizations)


22 Risk of illegal, irregular or unjustified transactions not being detected, measured on a four point scale according to the CFAA Guidelines (low, moderate, significant or high).
financial reporting, and the compliance remains a problem and authorities need to improve the quality of auditing, monitoring and supervision. The PEFA assessment report published in October 2008 also found that several critical Public Financial Management (PFM) elements including internal controls, internal and external audit, and financial reporting are still weak.

97. Despite the results of the above assessment, efforts are being made to use some elements of country PFM system. Particularly, the Treasury system is currently being piloted for maintenance of the designated accounts of Bank-financed projects.

98. The project Designated Accounts (DA) will be opened in the State Treasury. The use of other country PFM systems for the project implementation will be considered as the government progresses with the on-going PFM reforms.

93. **Procurement.** FFPMC will perform procurement functions under the project, in accordance with World Bank guidelines, published May 2004 and revised in October 2006 and May 2010. Detailed information is provided in Annex 8. The overall project risk for procurement is considered substantial after mitigations measures and should be reviewed during the mid-term review mission. FFPMC successfully implements the Public Sector Modernization projects (PSMP and PSMP II), the Social Protection Administration (SPAP) and the Additional Financing for SPAP project as well as several small stand alone grants.

94. The risks associated with procurement and the mitigation measures were identified in the procurement capacity assessment of FFPMC conducted during the pre-appraisal mission of April 2010. The procurement arrangements of FFPMC have been reviewed as part of this capacity assessment and have been found to be satisfactory. However, given that a number of packages with high IT content, PPPs and output based aid (OBA) are expected to be financed under this project, it is recommended to further enhance the capacity of FFPMC procurement staff with specialized training on IT procurement, PPPs and OBA including the use of the Bank’s standard bidding documents for IT procurement.

95. FFPMC has developed a draft Procurement Plan for project implementation which provides the basis for the procurement methods. The Procurement Plan will be updated in agreement with the Project Team annually or as required to reflect the actual project implementation needs and improvements in institutional capacity.

**D. Social**

99. This project will benefit the general population of Armenia, including rural areas where some of the country’s poorest and most isolated inhabitants live. It will promote access to modern telecommunications services and computers to a significant number of people with no previous access. The project will also improve the access of SMEs in regions to finance and knowhow and strengthen their skills levels and competitiveness, and help diversify regional economies and contribute to regional socioeconomic development.

100. OP 4.12 will not be triggered for this project. The Gyumri Technology Center would be established on land owned by the Government by refurbishing an existing government-owned
building. The Project Implementation Plan will describe the screening procedures so any civil works to be supported under the Project will not result in acquisition of private land or any other impact that triggers social safeguard policy. PPP documents will include clauses that will require civil works be conducted only within the existing right-of-way and without disrupting roadside businesses. Similarly, matching grants will not be provided if additional land needs to be purchased to implement business plans.

E. Environment

101. The Project is rated as environmental Category B due to infrastructure investments planned under its components 1 and 2. Civil works to be financed from the Project proceeds are not expected to have any significant or irreversible impacts, because the works for laying optic fiber cables will follow the right-of-way of the existing motor roads or other major infrastructure and the premises for Gyumri technology center will be provided through the rehabilitation of the existing building. Expected negative impacts of these works are minor and typical for any small scale civil works. They may be effectively mitigated through the application of general good construction practice and the adherence to the recommendations provided in the environmental management documents developed for the Project. Future operation of the e-society technical infrastructure and the Gyumri technology center will increase efficiency of the governance and improve the business environment in Armenia. The only potential long term negative impact is expected from periodic minor maintenance works on the installed wireless towers; though the strictly localized and modest nature makes this impact insignificant.

102. The Borrower commissioned an Environmental Framework including comprehensive study to develop Environmental and Social Management Framework (ESMF). An Environmental Checklist for Small Construction and Rehabilitation Activities was used to carry out a simplified environmental overview of the rehabilitation of Gyumri technology center and to develop an Environmental Management Plan (EMP) for it. On July 13 the ESMF for the broadband backbone infrastructure and the simplified EMP (environmental checklist) for the Gyumri technology center were disclosed in-country and on July 14 a stakeholder meeting was held to discuss the project design and its technical implication, including these environmental documents. Suggestions were made to further clarify the roles and responsibilities of various agencies involved in the screening process. These suggestions have already been incorporated. On July 15, 2010, a discussion of the preliminary design of Gyumri technology center was held in Gyumri municipality, at the office of the municipal chief architect, with participation of all concerned parties. The finalized ESMF and EMP were posted in the Infoshop on September 3.

F. Safeguard policies

103. The project implies civil works and triggers OP/BP 4.01 Environmental Assessment. According to it the project was subjected to environmental screening and classified as environmental Category B. Further, the ESMF and the site-specific EMP were developed for the project components 1 and 2 respectively. Based on the findings of the ESMF, OP/BP 4.04 Natural Habitats and OP/BP 4.11 Physical Cultural Resources were triggered as well. OP/BP 4.04 will be applied to ensure adequate screening and selection of the potential locations of wireless towers which, in difference from the other elements of the designed infrastructure, may
not fit within the existing right-of-way. Earth works in undeveloped landscapes may come across chance finds and OP/BP 4.11 is triggered to secure proper handling of any elements of presently unknown historical heritage in case they are encountered.

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G. Policy Exceptions and Readiness

104. The project does not require exceptions from current Bank policies and is ready to be implemented.

* By supporting the proposed project, the Bank does not intend to prejudice the final determination of the parties' claims on the disputed areas
Annex 1: Country and Sector or Program Background

Armenia E-Society and Innovation for Competitiveness Project (EIC)

I. Country background and overall government strategy

1. Armenia is a lower middle income country with a gross national income per capita of $3,350 (GNI per capita, Atlas method, 2008). The country is comprised of 10 regions (marzes) and the capital city of Yerevan, which also has the status of a marz. About 64% of the total 3,077,087 population lives in urban areas, of which one third lives in Yerevan. The services sector, concentrated in trade is one of the leading sectors of the economy that generates 34% of GDP.

2. Armenia’s prospects for inclusive and long-term growth require it to diversify into knowledge-driven sectors and upgrade the quality of domestic products and services. The Global Competitiveness Report 2009-2010 ranks Armenia 97 out of 133 countries on the GCI index. Trade has not been an engine of growth in Armenia despite the significant recent opening of its economy. Export growth in Armenia has been driven by few commodity groups with low value added and low knowledge intensity. Scrap metal, mines and ores together accounted for almost half of total exports in 2007. This export structure hinders Armenia’s opportunities to grow through exports. As a land-locked country Armenia is subject to transportation cost disadvantages that can only be compensated by moving to higher value products and services.

3. Against this backdrop, in June 2009, the World Bank adopted its new Country Partnership Strategy (CPS) for Armenia for 2009-2012. The CPS was developed in close partnership with the Government of Armenia (GoA) and is firmly grounded in Armenia’s Sustainable Development Program (SDP). The new CPS has a two-pillar approach: (i) Addressing Vulnerability, with the aim of mitigating the impact of the global economic crisis on Armenia and the most vulnerable population groups; and (ii) Promoting Competitiveness and Growth, with the objective of helping Armenia to position itself to take advantage of the recovery of the global economy and maintain high and sustained growth over the medium term. The proposed project is fully aligned with the objectives of the second pillar of the CPS.

4. In this context, the Government of Armenia (GoA) has demonstrated significant commitment to developing the ICT and knowledge-intensive sector by adopting its Information Technology Sector Development Concept Paper (Annex to the RA Government Decree No. 35 dated August 28, 2008), which lays out the government’s vision for the sector as achieving a “sustainable information society with advanced ICT infrastructure, high-level computer literacy, high level of computer saturation and Internet access, extended use of e-services systems, existence of large local IT market and progressive knowledge-based industry.”

5. The IT Sector Development Concept Paper further articulates a detailed and ambitious ICT Development Strategy with two key objectives:

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23 World Development Indicators, The World Bank Group
24 National Statistical Service of Armenia
25 Global Competitiveness Report 2009-2010, World Economic Forum
(a) Building an information and knowledge-based society with improved ICT infrastructure; high computer literacy, computer, and internet penetration rates; widely applied e-service systems; and a large local information technology (IT) market.

(b) Developing an internationally prominent IT industry with companies providing higher value-added research and development services and sophisticated engineering solutions and services competitive in the global markets.

6. The IT Sector Development Concept Paper calls for accelerated ICT infrastructure development in order to converge with European standards and to meet the Government’s expectations of economic development of the country. The results expected within the next five years include the following: 50% of priority government services are available online, 80% public sector computer penetration and 70% Internet penetration among country population, implying that the majority of government offices would need to be provided with broadband Internet access within that time frame. Currently, though, less than 5% of services are available online with 10% computer and internet penetration in the public sector.²⁸

7. The current pace of uptake of broadband services in Armenia is not sufficient to achieve these ambitious but reachable targets. According to the United Nations’ global e-government readiness reports for 2010, Armenia was ranked after 100 countries of the world (110 out of 183)²⁹. It was last ranked 107th on the telecommunications infrastructure indicator (access to Internet, computer availability, other means of communication)³⁰. In terms of Web presence, which typically implies availability of e-government services, the country occupies the 121st place³¹. The table below shows the comparison of e-government readiness rankings of several nations, including Armenia, and their change between the years of 2004, 2005 and 2008.³²

²⁹ United Nations e-Government Survey 2010
³⁰ United nationals e-Government Survey 2010
³¹ United nationals e-Government Survey 2010
³² Data from the 2005 UN Global E-Government Readiness Report and the 2008 UN E-Government Survey
II. Legal and institutional framework for e-society and innovation in Armenia

8. From February 20, 1998 to date, the telecommunications sector in Armenia is regulated under the Law on Electronic Communications. A new revision of the Telecom Law entered into force on 3 September 2005. It is complemented by other regulations and decisions of the Public Services Regulatory Commission (PSRC), which is the national regulatory agency. The 2005 Law and subsidiary legislation are modeled on the fundamental principles and approaches of the European regulatory package for electronic communications services and networks and have been developed with technical assistance from the World Bank and USAID.

9. The Ministry of Transport and Communications (the “Ministry”) is responsible for the country’s overall policy for sector development (Art. 4.1 Law) and development of the radio spectrum allocation table (Art. 4.3.a Law), as well as for setting universal services policy objectives (Art. 4.2 Law) and adopting technical standards (Art. 4.9 Law).

10. The PSRC is the Armenian multi-utilities regulatory authority, responsible for regulation of activities in the sectors of electric power, natural gas, thermal energy and water in addition to electronic communications. It has an objective to ensure the competitiveness of the market and its responsibilities include licensing, SMP designation and dispute resolution. Regulatory tasks relating to the electronic communications sector are addressed within the Telecommunications Department of the PSRC.

11. Armenia’s competition law and competition authority are relatively new. The law “On the Protection of Economic Competition” was enacted in 2000, and the State Commission for the Protection of Economic Competition (SCPEC) was created in 2001. The procedures regulating the interaction between SCPEC and PSRC in the area of electronic communications are not yet fully formalized, but a good cooperative environment appears to exist between both agencies.

12. Armenia’s law on electronic documents and electronic signatures was approved in 2005 to create the legal framework for electronic transactions, on the basis of public key infrastructure (PKI) technology, including the basis for creation of Certification Authorities for electronic signatures. A government decision of 2009 created the E-Governance Infrastructure Implementation Unit OJSC (EKENG in Armenian) under the Ministry of Economy, which establishes the legal basis for a national Certification Authority for e-ID cards and biometric passports.

13. The Enterprise Incubator Foundation (EIF) was established by the GoA in 2001 within the framework of the World Bank’s Enterprise Incubator Learning and Innovation Loan. Since its inception it assists the local IT and knowledge-intensive sector by providing a combination of business, training, and facility services.

14. The National Competitiveness Foundation of Armenia (NCFA) is an independent entity founded through a partnership between the GoA and a group of leading representatives of the private sector from the United States, Russia, the European Union and the Middle East. The Foundation aims to achieve breakthrough development toward national competitiveness in key areas of economic activity. One key sector of activity chosen as a priority by NCFA is the telecommunications sector, with a view in particular to accelerating broadband development in
the country. NCFA also sees the IT/knowledge-intensive sector as a key enabler of innovation and competitiveness for Armenia and has also included it among its list of priority sectors.

**Enabling environment for innovation**

15. An enabling environment is a necessary condition for innovation. It promotes investments in innovative projects by strengthening incentives and decreasing risks for entrepreneurs. It also enhances the supply of drivers of innovation by attracting and retaining skilled workforce and knowledge-intensive businesses. The enabling policy environment covers issues such as competition policy, intellectual property rights (IPR) policy, barriers to starting and closing a business and legal barriers to establishing venture capital funds.

16. For example, in Armenia lack of market competition stifles entrepreneurship and innovation. The country ranks 132 out of 133 countries on the 2009 GCI in terms of “Effectiveness of anti-monopoly policy”. The legal framework for protection of competition is weak, unclear and not enforceable. Some provisions of the competition law – including those on restrictive agreements and on dominance and abuse of dominance – are out of step with current trends in international practice and may actually be competition restricting rather than competition enhancing, if enforced as written. Other provisions – including those on concentration control, pricing coordination, and state aids – are vague or contain confusing language that makes them difficult to apply in practice. Moreover, there is limited capacity to implement competition law. Competition law is a complex reform area. It requires staff of the competition body to perform sophisticated economic analyses and distinguish between positive and negative effects, between varying motives for business behavior, and between permissible and impermissible degrees of restriction. The EU is currently providing technical assistance for competition issues and capacity building for the competition authority in Armenia.

17. Another example is IPR policy. Patents stimulate innovation by granting temporary monopoly rights to organizations that invest in innovation. Armenia ranks 103 out of 125 countries on the 2010 Intellectual Property Rights Index. This does not take into account IPR legislation that guides the commercialization of public research. Current IPR legislation gives the state IPR ownership rights and does not provide incentives for researchers in public institutions to patent and commercialize their research. This, in turn, deters private enterprises and foreign research institutes from entering into joint research projects with Armenian research institutes and acts as an impediment to venture capital investments.

18. The GoA is in the final stages of negotiation with USAID of a new major technical assistance program, of an estimated US$ 20 million value, which will include as one of its pillars support for improving the policy, legal and regulatory enabling environment for innovation.

### III. E-Society infrastructure background

19. Since 2007 Armenia enjoys a fully liberalized telecommunications sector, with three major competing mobile operators, numerous Internet Service Providers, and a number of new entrants capitalizing on new technologies such as WiMAX and 3G. Substantial growth over the past four

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years in mobile penetration, which has now exceeded 100%, places Armenia in third place within the CIS, ahead of its sub-regional neighbors, according to end 2008 data from the International Telecommunication Union (ITU)\textsuperscript{34}.

20. However, the level of Internet penetration is still far from being satisfactory. According to various estimates, including the 2008 industry survey by Enterprise Incubator Foundation (EIF) and ITU data, by end 2008 the number of Internet users in Armenia stood somewhere around 150,000-200,000 or 6.2\%\textsuperscript{35} of the entire population while the number of individual Internet accounts had reached around 90,000 or 3\% of the population. It should however be noted that while dial-up access is still prevalent among individual users (about 80\%), they are gradually shifting to broadband technologies like DSL, WiMAX and 3G.

21. Indeed, broadband subscribers, excluding 3G, were estimated by PSRC at around 10,000 in 2008, but a substantial growth was experienced in 2009 and the number of subscribers may have reached close to 75,000. According to data published by TeleGeography, household broadband penetration in Armenia for end 2009, stood at 8.3\%, ahead of Azerbaijan with 1.9\%, but behind Georgia (12.7\%), Ukraine (10.3\%), Moldova (11.4\%), Russia (22.6\%), and well below Estonia with 65.1\% and Western Europe, with typical household broadband penetration rates in excess of 60\%\textsuperscript{36}. Data for 3G subscribers is not yet available, given that it is a new offering in the market, but once accounted it is expected that the 2010 data will demonstrate important improvements.

22. Key major network operators in the telecommunications sector of Armenia include: Armentel, the former incumbent telecom provider known by its brand name Beeline, a vertically integrated fixed, mobile and Internet service provider, majority owned by Vimpelcom of Russia; Vivacell, the 2nd national mobile network provider, majority owned by MTS of Russia; Orange Armenia, the 3rd national mobile network provider, a wholly owned subsidiary of France Telecom; ADC (Armenian Data Company), an ISP positioned mainly for business customers in Yerevan; Arminco, ISP for business and residential customers in Armenia; ICON, an ISP focusing on residential customers in Yerevan; Cornet, a national ISP for business and residential customers; Ucom, a full service provider for residential and business customers in Yerevan; GNC-Alfa, national and international network service provider; Fibernet Communications, a national and international network service provider.

23. The liberalization efforts gained steam in February 2009, with the licensing of eight alternative operators for fixed telephony, which are investing in their own infrastructure. Despite the expiration of the monopoly of the former incumbent telecommunications network provider in October 2007, it was very hard for competitors to obtain access to the infrastructure of Beeline. Therefore major ISP’s and alternative carriers decided to build their own fiber optical networks, starting in Yerevan.

24. Beeline operates the most extensive fiber optic network in the country. Almost all main switches of the fixed network are connected via Beeline’s fiber optic backbone network. The two alternative national fiber optic network providers are Fibernet and GNC-Alfa. Both companies started with international connections from Yerevan to the borders of Iran and Georgia. Their

\textsuperscript{34} 2009 World Telecommunication/ICT Indicators.
\textsuperscript{35} 2010 The Little Data Book on ICT
\textsuperscript{36} TeleGeography GlobalComms database.
plans for 2010 include the connection of major cities (including the capitals of the individual Marzhes) and establishment of national ring configurations in order to improve network availability and coverage.

25. Competition in international connectivity since 2009 is already leading to significant price reductions and prices are estimated to further drop during 2010. At the end of 2009, the aggregate international capacity reached approximately 3 Gbps, provided by three different network providers: Beeline, Fibernet and GNC-Alfa. The Internet capacity by end 2010 is predicted to be approximately 6 Gbps. The average wholesale price per E1 half circuit per month for international connectivity was about US$ 450 at the end of 2009, while it had been around US$ 1,400 in 2008. The same bandwidth is expected to be offered for US$ 270 in 2010, but still needs to drop further, to below US$ 100, in order to be in line with prices charged in major European markets.

26. When it comes to services in the regions, however, the supply gaps are immense. For example, Beeline is the only network provider which owns fiber optic infrastructure within the regions connected to their central offices. The available bandwidth is insufficient, due to the lack of reliable broadband internet connections to the municipalities. Also, the existing infrastructure serving the government intranet is mainly based on connectivity to most ministries within Yerevan with broadband internet connections and LAN interconnectivity. All other connections to provinces and municipalities are based on public Internet connectivity only. Broadband backbone extensions to the regions are therefore urgently necessary to avoid a major digital divide from emerging within Armenia.

Government as a Major User of Telecommunications Services

27. As part of its strategy to promote the deployment of such a nationwide broadband backbone network, the GoA plans the creation of a government virtual private network (VPN) or intranet, an integrated voice and data platform, allowing for seamless interconnection of government agencies and public facilities like schools, health institutions, libraries, etc. The Ministry of Economy is in the process of compiling data on current government expenditure on telecommunications services. Preliminary estimates for central government alone put the figure at somewhere between US$ 10 and 15 million annually. By consolidating this spending and progressively channeling it to the VPN, government expects that it will at the same time save costs and increase the quality of telecommunications services provided to all public institutions.

28. Such government VPN will provide government with a future-proof platform to better manage costs and security of government communications and will in turn enhance the commercial viability of the national broadband backbone infrastructure. Once implemented, the government’s VPN will ensure effective and secure exchange of communication, thus saving time and reducing associated costs. From a long-term perspective, it will create an operational platform for provision of a wide range of online government services to both citizens and businesses (G2C and G2B), which again will result in cost reductions, increased revenues and overall improvements in quality of public services.

37 Ministry of Economy.
**Building blocks for an E-Society**

29. As Armenia is embracing the challenge of transforming to an e-society and the implementation of e-services, an interoperable enabling infrastructure becomes a necessity. The GoA is developing an e-society/e-government enterprise architecture (EA) providing a common framework that ensures general coherence among different information systems which will allow different government entities to not only coordinate the various e-society initiatives and to align information systems with overall business goals, but also will ensure interoperability and avoid duplicate investments. It will also permit the roll out of applications across government (and private sector) in a more efficient manner.

30. Within this context, a secure electronic means of user identification for accessing both public and private e-services becomes a crucial requirement, both as a key building block of the enterprise architecture and important enabler in the process of building an e-society. Hence, a secure, efficient, and affordable electronic Identification System (e-ID) is an essential element in the chain of trust that provides a framework for safe digital exchanges, both for the provision of government services on-line to citizens and businesses, as well as for the paperless flow of electronic documents with digital signatures between and within government entities.

31. The GoA has developed plans for establishing a public key infrastructure (PKI) for secure identification with citizen’s privacy protected and has started the process of creating a fully independent certification authority that would provide this service. In the case of Armenia, the GoA has considered it efficient to also integrate the issuance of physical ID cards with the electronic identification (certification) to guarantee efficiency, scalability and affordability of the solution.

32. Additionally a National Action Plan for the introduction of an electronic passport and an electronic ID card is recommended by the Organization for Security and Cooperation in Europe (OSCE) and the International Organization for Migration (IOM). Introduction of Identity and Travel Documents with Biometric Parameters also responds to a request to IOM made by Armenia in 2008 to provide relevant technical assistance which stems in part from IOM dialogue and relationship with the EU.

33. The convergence of all the various elements mentioned above including the prerequisites for introduction of electronic passports and identification cards with biometric data, and the required infrastructure for creating the building blocks for e-ID cards creates an opportunity to address these needs and fulfill these requirements in a coordinated and parallel manner. The potential to converge these two initiatives leads in the direction of creating the infrastructure that will allow for addressing both of these needs under a unified initiative dubbed “Digital Citizen”.

34. For the unique identification of citizens while receiving government or non-government e-services, a unique identification number needs to be used to ensure that each citizen would be uniquely identified in any system or database. The intention is also to have the social security card number embedded in the e-ID.

35. The GoA’s pension reform program intends to facilitate electronic pension account management through the web, which will require some form of e-ID. This will potentially ensure
100,000 – 150,000 users. Also, the healthcare system reform foresees that there will be a need for e-health services, which will also require some form of e-ID. In addition, it is expected that the creation of proper e-authentication mechanisms will create a platform for rapid development of e-banking services further promoting the development of the financial and banking sectors.

36. On the demand side, the level of personal computer (PC) penetration rates is a key measure of a country’s ICT development and e-readiness. Current PC penetration in Armenia is 9.7 per 100 people and internet penetration is 6.2 per 100 people\textsuperscript{38}. The PC penetration in Armenia is much lower than in other countries in the region that advocated and supported targeted ICT development programs such as Estonia (66.2 per 100 people), Latvia (60.4 per 100 people), Lithuania (54.4 per 100), Russia (31.9 per 100 people)\textsuperscript{39}. Further improvements in PC penetration and usage are critical for improving delivery of services to citizens, increase in productivity, and access to expanded educational opportunities.

37. Through its IT Sector Development Concept Paper\textsuperscript{40}, the GoA has laid out an ambitious 10-year plan to substantially increase computer and internet penetration rates in Armenia. The table below shows the GoA’s current targets:

<table>
<thead>
<tr>
<th>Penetration</th>
<th>2008</th>
<th>2018</th>
<th>CAGR, 10 year</th>
</tr>
</thead>
<tbody>
<tr>
<td>Household, PC</td>
<td>10%</td>
<td>70%</td>
<td>21%</td>
</tr>
<tr>
<td>Education sector, PC</td>
<td>10%</td>
<td>90%</td>
<td>25%</td>
</tr>
<tr>
<td>Government and state agencies, PC</td>
<td>10%</td>
<td>100%</td>
<td>26%</td>
</tr>
<tr>
<td>Population, internet</td>
<td>5-10%</td>
<td>90%</td>
<td>34%</td>
</tr>
</tbody>
</table>

38. Thus, considerable growth rates over 20% CAGR (compound annual growth rate) in computer usage and internet access are required to reach the target penetration rates. Assuming that Armenia has almost 800,000 households (~4.1 person per family, 3.2 million people), today only 80,000 families own a computer at home, while the 10 year target is around 560,000 families. To reach this target, at least 48,000 computers per year should be sold to the population. Current average annual sales cover only an estimated 30% of this target.

39. Affordability of PCs is however an issue in Armenia due in part to the lack of affordable consumer credit and the lack of trade credit for importers. To acquire a low-end new desktop computer with a monitor would require at least around AMD 180,000 in cash. According to the National Statistical Services of Armenia (NSSA), in 2008 the average monthly per capita income of households was AMD 29,572; in urban areas it was AMD 31,180 while in rural areas it was AMD 26,605. Further, according to NSSA, the average monthly per capita expenditure on non-food products was 16.4%. Thus, with four people per household on average, the monthly household income would be AMD 118,288 where AMD 19,400 per month is spent on non-food products. Obviously, if the average monthly household income is less than the cost of a new low-end computer and only about AMD 20,000 per month is spent on non-food items, it can be concluded that an average Armenian household cannot afford to buy a new computer for cash and innovative financing approaches will need to be put in place.

\textsuperscript{38} 2010 The Little Data Book on Information Communication Technologies
\textsuperscript{39} 2010 The Little Data Book on Information Communication Technologies
\textsuperscript{40} IT Sector Development Concept Paper, Annex to the RA Government Decree No. 35 dated August 28, 2008.
40. Current bank rates for consumer loans are 20-24% with at least 30% cash upfront payment for such loans with a loan period for computer equipment of around 12 months. In order to buy a computer for AMD 180,000 based on 20% rate / 30% cash / 12 months financing scenario, a consumer loan would require AMD 54,000 in upfront payment plus around AMD 12,000 per month for duration of 12 months. While the monthly payment is affordable to households with somewhat higher than average income, the upfront cash payment is a key deterrent for many to apply for a consumer loan. In addition, the calculations were made for the lowest end desktop computers that may not meet the quality requirements and demands of various population groups. Higher end desktop computers would cost AMD 240,000 or more with a monitor, while laptops are in the range of AMD 320,000 – 800,000 (these figures are cited for cash based purchases). Thus, almost all computers from low-end to high-end are practically out of reach for an average Armenian household.

41. The “Computer for All” program was designed to address the above issues by offering reduced pricing and financing schemes that would enable a larger number of Armenians to acquire new and higher quality computers, both desktops and laptops, and is expected to be applicable in the future as well to newer kinds of comparable access devices as they come into the market. This program is designed to support the implementation of the GoA’s ICT sector development strategy and the goals for increased computer penetration.

42. To validate the program design, a pilot stage was run for a six month period ending in April 2010. The pilot stage included one vendor, Unicomp (associated with HP) with participation of six shops in Yerevan, Gyumri and Vanadzor. One bank participated in the pilot, ACBA - Credit Agricole Bank, and the website www.computerforall.am was established to inform the public about the program.

43. The pilot stage has been assessed as successful and has validated the design of the program. In particular, it was found that demand for computers proved to be larger than initially anticipated: instead of 500 computers during the initial 6 months, it is estimated that close to 3,000 units were sold by the end of January 2010, and sales could average around 1,000 computers per month despite the limited size of the pilot. A detailed evaluation of the pilot stage is available in the project files.

IV. Innovation and Technology Absorption in Armenia

44. Innovation and technology absorption at the firm level are essential elements of building an inclusive e-society in Armenia, as firms are at the same time consumers and producers of information products and services. However, limited innovation in the private sector currently hinders economic diversification, industrial upgrading and access to global markets. Armenia ranks worse on the GCI’s “innovation and sophistication factors” pillar (112 out of 133) than on any other pillar. Armenia’s spending on R&D is low, although this is a key input for innovation and for building technology absorptive capacity. R&D expenditures represented only 0.21 percent of GDP in 2007.41 As a comparison, Belarus and China, both with approximately the same GDP per capita as Armenia, invest 0.97 and 1.49 percent of GDP in R&D respectively.42

41 UNESCO Science and Technology Statistics.
42 UNESCO Science and Technology Statistics.
High-income economies typically invest 2 to 3 percent. Moreover, most R&D in Armenia is conducted by the public sector. In OECD countries, two-thirds of R&D spending is made by the business sector, where it can most easily translate into commercial outputs.

45. Armenia shows limited ability to absorb, adapt and improve existing technologies, a key strategy for technological catch-up. Product quality is low and Armenian firms do not meet international quality standards. To compete on quality in global markets and attract FDI Armenia needs a core base of domestic firms able to provide goods and services produced according to international standards. According to the 2009 GCI, Armenia ranks 112 out of 133 countries with regards to the quality of suppliers. Adoption of modern management processes that support quality in firms is also low. In 2007, Armenia registered only roughly half the number of ISO 9001 quality management system certificates as Belarus, and a quarter that of Croatia or Spain when accounting for their relative industry value added.

46. While existing innovation performance is weak, entrepreneurship trends in Armenia show potential for bringing new products and services to the market. One measure of entrepreneurship activity is the rate of new firm formation in the formal sector. This rate tends to be higher as national per capita income increases. In Armenia, in 2007, more firms were formed relative to the working age population than in the vast majority of countries at or below its PPP income level. Only Moldova has a higher rate within this country group.

47. The recent emergence of a dynamic IT industry in Armenia illustrates the country’s potential for knowledge-based diversification. Within the IT industry, the software and services segment is particularly dynamic, having grown at an average rate of 27 percent per annum from 2000 to 2009. In 2009, the IT industry’s share in Armenia’s GDP was 1.1 percent, comparable to that of India (1.4%) and Germany (1.3%). The sector is globally-oriented. Around 55 percent of the industry’s output is exported to over 20 countries, and 40 percent of IT firms are foreign-owned. The largest share of exports, almost 60%, goes to the United States and Canada, the second largest is Europe with 24%, and third comes Russia and CIS with 22%. The industry employs a highly-skilled workforce and offers wages which are significantly higher than national averages.

48. A weak enabling environment, lack of sufficient skills and knowhow, and the absence of public support instruments for innovation all constitute barriers to innovation, technology absorption and knowledge-based enterprise growth in Armenia.

**Innovation Policy**

49. In any country, market and systemic failures result in underinvestment in innovation and technology absorption by the private sector and limited diffusion of knowledge and technology.

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43 Business R&D expenditure data for Armenia is not reported in UNESCO statistics but the 2007 European Commission report, *2007INNO-Policy TrendChart - Policy Trends and Appraisal Report – Armenia*, estimates it at less than half of total R&D.
45 ISO 2008 Survey of Certificates; World Development Indicators.
OECD countries resort to innovation policy to address these market gaps. The main types of innovation policy instruments aim to address financing gaps, institutional issues, infrastructure gaps, lack of coordination of complementary inputs, weak linkages between the different elements in the innovation system and capability and learning problems.

50. Armenia’s support for innovation is limited to supporting public research institutions and an overall innovation policy is lacking. However, a major upcoming USAID technical assistance program is expected to include support to cover this gap in the near term, through one of its proposed pillars focused on innovation. A public institution created with support from a previous World Bank project, the Enterprise Incubator Foundation (EIF), provides financial support for innovation and incubation services, but due to its size, its impact is limited. Knowledge-intensive firms, including high tech and IT industries, are constrained by low access to credit and commercial investments due to disproportionately high transaction costs, longer time horizons and lack of tangible collateral.

51. In contrast to developed countries, Armenia is short of appropriate financing mechanisms available to technology start-ups in the United States or Europe, such as venture funds and other institutional financial intermediaries focused on small and medium business financing. Both local and foreign investors are reluctant to invest in the Armenian technology sector because of the high risks associated with the industry and Armenia in general. One of the key factors behind this low interest is the lack of a clear exit strategy: few opportunities exist for investors to recoup their investments via common exit methods such as mergers and acquisitions, equity sales, or initial public offerings (IPO). Investment funds are scarce or not available at all for the ventures that have rates of return and level of riskiness comparative to those of the local tech projects.

52. Previous investment fund efforts in the region failed because of fund raising difficulties tied to the proposed management team’s lack of demonstrable track record, failure to commit sufficient capital, and high fee structure. These funds also engaged in extensive outreach, soliciting proposals from prospective target companies, but then failed to finance investment requests, damaging the perception of private equity investment among some business owners. These and other issues such as high transportation, communication, and legal costs create substantial difficulties for companies in the technology sector to obtain financing and, in turn, impede the growth of technology-intensive industries. Thus, creation of new financing mechanisms customized to the needs of the Armenian technology companies becomes increasingly important for the further development and growth of the Armenian technology sector.

53. The GoA aims to improve the environment for newly formed businesses, including through the availability of incubators and technoparks that would host not only start-ups but also operating companies. In the Armenian context, incubators and technoparks are planned to provide quality facility services: office space with all the necessary equipment, furnishing, communications, and services.

54. In addition, the industry needs a number of supporting activities and programs targeted at increasing the supply of qualified technical and business graduates; improving the quality of education at Armenian universities; offering continuous educational and training mechanisms and facilities; improving business environment and communications infrastructure; shifting the
industry's focus towards higher value-added products and services; increasing size and sophistication of the domestic IT market; improving access to foreign markets; enhancing company productivity and product development skills; and others.

Development of the IT/Knowledge-intensive industry

55. The local market is very narrow to absorb the expected growth of local IT/Knowledge-intensive firms. Export markets are considered as the main destination for IT products. There are different strategies to promote exports and as the international practice suggests, strong Government support through Development Agencies plays an important role. Specifically, well designed programs tailored to address the market needs would provide information support on opportunities in target markets through market research and development of export capabilities, as well as assistance in companies’ foreign economic endowments through matchmaking, marketing support and linking companies with foreign partners and country image building activities.

56. However, one of the major impediments to Armenian IT companies’ expansion is seen to be the limited scale of qualified workforce. A large pool of skilled labor is critical to IT/Knowledge-intensive industry development, while the relevant education sector suffers from being under-resourced. At the same time there is a low level of spending allocated to in-house training within companies.

57. Another constraint to IT sector expansion is the low productivity of companies. The majority of companies do not consider productivity as an important dimension for competitive strategies. In addition, there is a lack of formal standards for IT industry and a relevant standardization authority for the IT sector.

58. The GoA is determined to take advanced steps in improving the environment and consider establishment of a certification center, strengthening the capacity of the local certification agencies, expanding the scope of training centers, as well as conducting a series of workshops, seminars and trainings to demonstrate the benefits of adopting productivity monitoring and evaluation methods.

Regional Economic Development through Technology

59. Relevant infrastructure for business incubation and industry development is almost non-existent in the regions. Gyumri is the second largest city of the Republic of Armenia, with a population of 170,000 people, about 120km north-west from the capital city Yerevan. However, Gyumri is far behind Yerevan when it comes to the availability of modern office space, communication infrastructure, training facilities, assistance to start-ups and training and advisory services for firms.

60. Gyumri’s proximity to the border with Georgia, its short distance to the border with Turkey and its nascent cluster of technology-intensive firms active in various productive sectors, such as jewelry and fashion design, among others, provide some hope for regional economic development through intensive use of technology.
The GoA has developed a comprehensive strategic framework for transforming Gyumri into a “Technocity”. While current company base in Gyumri is modest, it has the potential to grow. The GoA’s vision for the Gyumri Technocity aspires at transforming this potential into reality. Current plans for the Technocity encompass several interlinked elements, including establishing and following an urban development strategy, creating a special economic zone and fostering identified sectors with future growth potential. Additionally, a special focus is to be given to the development of the centrally placed elements of the Technology Park, Free Zone, and Micro-enterprise and Tourism and urban regeneration equipped with broadband and connectivity. The World Bank and the GoA through a number of studies are seeking to confirm the potential for synergies and identify sequencing of these various approaches.

The first phase of this strategy calls for the creation of the Gyumri Technology Center (GTC), an enterprise incubator in downtown Gyumri, which will house high quality business facilities aimed at serving a cluster of technology-intensive firms in the city. GTC will allow reducing the operating costs of residents, achieving economies of scale and supporting the growth of the local business sector, by making it available and attractive to small and medium sized companies.

The GoA envisages that business incubators such as GTC could provide considerable support to local companies and would create the basis for the long-term development of knowledge-intensive industries in Gyumri. In addition, if successful, this incubation model could be considered in other regions of Armenia such as Vanadzor and Syunic.

V. Summary of major sector challenges which the project aims to address

105. Low level of Internet penetration: Access to broadband is currently at an insufficient level to achieve the government’s aspirations of a modern Information Society. According to the UN’s global e-government readiness reports for 2004, 2005 and 2008, Armenia was ranked behind 100 countries on the communication infrastructure indicator. Insufficient international connectivity and frequent cable damages and service disruptions often result in considerable outages disrupting the country’s Internet connectivity for several days in a row. The overall quality of the retail Internet remains far from being satisfactory.

106. Major inequalities in access to modern ICTs between the capital city and rural areas: This issue is compounded by high prices for advanced services, notably broadband Internet, to a large extent due to the lack of competition in access to international telecommunication networks and a dearth of investment in domestic backbone networks. Although after the liberalization of the Armenian telecom market the cost of international connections has substantially decreased, it is still notably higher in comparison to that of connections in European and certain CIS countries. The monthly fee for unlimited Internet traffic of ADSL technology at the speed of 1 Mbps stood in 2008 at US$ 80 in Armenia, US$ 10 in Georgia, US$ 40 in Azerbaijan, and US$ 28 in Turkey.

49 Current government estimates put this figure at around US$ 40 per month.

50 Mediamax New Agency, July 6, 2009: Quoted from the report of the Armenian office of Academy for Educational Development (AED) and the United States Agency for International Development (USAID) on the Armenian telecommunications sector.
107. **Lack of coordination of ICT development efforts:** As a result of the complexity of interactions between government entities, sometimes with overlapping responsibilities, and the cross-cutting nature of ICT, it is very difficult to coordinate the ICT-based development efforts in GoA, which leads to duplicating the investments and “stove-pipe” systems. This will present a major barrier to providing seamless e-services.

108. **Low level of PC penetration:** Current PC penetration in Armenia is 9.7 per 100 people and internet penetration is 6.2 per 100 people\(^5^1\), which is much lower than in other countries in the region that advocated and supported targeted ICT development programs such as Estonia (66.2 per 100), Latvia (60.4 per 100), Lithuania (54.4 per 100), Russia (31.9 per 100)\(^5^2\). Further improvements in PC penetration and usage are critical for improving delivery of services to citizens, increasing productivity, and expanding access to enhanced educational opportunities.

109. **Unaffordable prices for even low-end PCs:** To acquire a low-end new desktop computer with a monitor in Armenia would require at least around $450 in cash. In 2008, the average monthly per capita income in Armenia was $78\(^5^3\), which implies a monthly household income of $312 (assuming on average four people per household). With an investment cost higher than the average monthly household income, PCs are unaffordable for the local population. In addition, current bank rates for consumer loans are 20-24\%, and require a large upfront cash payment of 30 \% or more, and thus consumers are reluctant to obtain a loan to finance the purchase of a computer. There is therefore a need to offer specific pricing and loan schemes that would enable a larger number of Armenians to acquire new and quality computers (including desktops, laptops, and other comparable access devices).

110. **Fast obsolescence of specialized skills and migration of young talent:** This issue is mostly due to the lack of modern training infrastructure and a stagnant market for re-skilling, which leads to a disconnect between the training provided and the demands of the industry.

111. **Weak local entrepreneurship:** This is in large part related to the absence of support structures, lack of value chains, and low appreciation for the value of intangibles (brand names, business reputation, marketing and managerial skills, networks, etc.), which hamper all high tech industries, including IT. Professional advice, certification, sales promotion, training, is essential for industry development.

112. **Low access to credit and commercial investments:** High tech and IT industries are most impacted by this constraint in access to credit due to disproportionately high transaction costs, longer time horizons and lack of tangible collateral.

113. **Lack of adequate infrastructure for business incubation in the regions:** The absence of incubation and industry development facilities outside of Yerevan is striking, notably in Gyumri, being the second largest city in the country. Quality office facilities with relevant services at reasonable prices are important elements for supporting the domestic industry. Professional

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\(^5^3\) National Statistical Services of Armenia (NSSA).
advice, training, help with soft and hard technologies, marketing and fund raising are additional elements to help start-ups as well as existing companies.
Annex 2: Major Related Projects Financed by the Bank and/or other Agencies

Armenia E-Society and Innovation for Competitiveness Project (EIC)

World Bank Projects in Armenia

1. P044852 - Enterprise Incubator LIL. US$ 5 million. 2002-2006. The project piloted innovative private-public mechanisms for providing business development services to nascent enterprises and continuous education and training to students and professors, with a particular focus on the IT sector. The project supported the creation of the Enterprise Incubator Foundation (EIF), promoted employment creation and productivity improvements in the sector, attracted FDI in IT-related manufacturing, and piloted demand-driven mechanisms of continuous upgrading of IT skills of students, professors, enterprise managers and employees.

2. P060786 - Public Sector Modernization Project, Information technology component. The objective of the project is to enhance efficiency in public sector management through: (a) piloting innovations in selected institutions; and (b) improving transparency in government decision-making and policy implementation.

3. P107772 - Second Education Quality and Relevance (APL 2). The Project Development Objectives are: (i) enhance and facilitate school learning in general education and improve the school readiness of children entering primary education; and (ii) support the integration of Armenian Tertiary Education system into the European Higher Education Area.

4. P115109 - Access to Finance for Small and Medium Enterprises. The project objective is to maintain or increase Armenian small and medium enterprises' access to medium term finance. The project is designed to provide wholesale funding for on-lending to SMEs in urban, rural and peri-urban areas. It is foreseen a number of banks would be qualified as Participating Financial Institutions (PFIs).

5. PPIAF grants. Through an initial grant in 2001-2004, the World Bank provided assistance for the development of the Telecom Law and subsequent liberalization of the telecommunications sector. A second PPIAF grant in 2006-2009 provided assistance in the area of Universal Service Fund.

Projects Finance by Other Development Partners in Armenia:

6. USAID: Providing financing through GDA mechanism. USAID is also implementing a Competitive Armenia Private Sector Project.

7. USAID is now designing a new large project in mentioned areas but the scope is not finalized yet and they are actively coordinating with the World Bank not to overlap.

8. Other donors like EU, UN, IFC and others do not have major specific projects in these areas but some of their projects have an indirect relation to the mentioned area, such as SME development, improving regulatory environment, community building, etc.
9. P073458 - Bhutan - Private Sector Development Project. The objective of the project is to increase productive employment in Bhutan through promotion of enterprise development in the IT/ITES sector, enhanced IT skills, and improved access to finance.

10. P081771 - Sri Lanka - E-Lanka Development Project. The project development objective is to enhance growth and equity. The IT objective will be achieved by: developing leadership and skills in ICT; and creating employment in the ICT industry and ICT enabled services by enhancing the competitiveness of user industries and services.

11. P090695 - Kazakhstan - Technology Commercialization Project. The objective of this pilot project is to demonstrate significantly improved scientific performance and commercial relevance of research performed by inter-disciplinary teams of scientists selected through transparent competitive process. Specific IT Objectives: (1) number of completed technology audits; and (2) establishment of the Technology Commercialization Office.

12. P093610 - Ghana – eGhana. The objective of the Project is to assist the Recipient to generate growth and employment by leveraging ICT and public-private partnerships to i) develop the IT Enabled Services industry, and ii) contribute to improved efficiency and transparency of selected government functions through e-government applications.

13. P106589 - Mexico - Information Technology Sector Development Project. The general objective of the project is to contribute to developing the IT and ITES Industry in Mexico, by improving its human skills, infrastructure, links between local and global companies, financing and legal and regulatory framework.

14. P106752 - Argentina - Unleashing Productive Innovation Project. The objective of the project is to expand Argentina’s capacity to generate productive innovation in knowledge-based areas.
Annex 3: Results Framework and Monitoring
Armenia E-Society and Innovation for Competitiveness Project (EIC)

1. The table below summarizes the results monitoring framework, including the PDO outcome indicators and intermediate indicators identified for the project. In addition, a number of output indicators were identified to keep track of the individual activities. The comprehensive list of outcome and output indicators is contained in the detailed M&E report prepared under the PHRD grant and available in the project files.

<table>
<thead>
<tr>
<th>PDO</th>
<th>Project Outcome Indicators</th>
<th>Use of Project Outcome Information</th>
</tr>
</thead>
</table>
| Address constraints to competitive e-Society and enterprise innovation in Armenia by strengthening the underlying infrastructure and enabling environment. | - Access to internet services (% of population using the Internet)  
- Access to computers (% of population using a computer)  
- Development of Knowledge and Technology intensive industries (ratio of IT/ITES Sector\textsuperscript{54} revenue in GDP)  
- IT/ITES Sector Employment (number of people) | Assess progress towards meeting the project development objectives |

<table>
<thead>
<tr>
<th>Intermediate Outcomes</th>
<th>Intermediate Outcome Indicators</th>
<th>Use of Intermediate Outcome Monitoring</th>
</tr>
</thead>
</table>
| Component 1. e-Society Infrastructure Development | Increased access to affordable broadband services for citizens, businesses and public institutions | - Residential broadband household penetration  
- Business broadband penetration\textsuperscript{55}  
- Public sector institutions/ offices connected to broadband  
- Price of retail broadband access as a % of average monthly salary | Assess improvements in Armenia’s infrastructure for e-society |
| To equip citizens and businesses with a tool for identification and authentication for electronic transactions | - Number of electronic certificates issued | Monitor progress towards a more secure e-society environment |
| Increased access to affordable computers, content and e-services for citizens | - Number of households owning a computer purchased under the Computer for All program | Assess improvements in e-readiness of Armenian households |

\textsuperscript{54} IT services, Software, ISPs and engineering services.  
\textsuperscript{55} Number of corporate subscribers, data to be collected from ISPs.
Support innovation and technology start-ups through improved access to finance

- Number of Ideas/Matching grants approved
- Number of projects financed through the Venture Fund
- Number of projects prepared and presented to potential investors

Assess improvements in access to finance by technology-intensive firms

Gyumri Technology Center (GTC) established and contributes to the region’s enterprise innovation

- Number of enterprises benefited from GTC
- Occupancy rate of GTC

Assess impact of GTC in improving regional enterprise innovation environment

Enhanced capacity and growth of the IT/Knowledge-intensive sector

- Export of IT/ITES services (million USD)
- Amount of sales and investments generated by the representative office (million USD)
- Labor productivity in IT/ITES sector (thousand USD per employee)
- Number of manpower trained and certified under the project (number of people)

Monitor growth and competitiveness of the Armenian IT/Knowledge-intensive sector

2. It must be noted that the PDO indicators will require household and enterprise surveys, and hence it is expected that they will be reported three times during the life of the project: at project start, at mid-term and at project end. All other indicators will be collected more frequently, mostly on an annual basis. In addition, the participating agencies will keep track of output indicators associated with their particular activities, and will report on them to the World Bank ahead of every supervision mission, alongside the applicable intermediate and PDO outcome indicators, to assist in assessing progress towards meeting the PDO.

3. In addition to the above indicators, the project will monitor progress towards the government’s higher level objectives through the following indicators:

- Armenia’s ranking in WEF’s Global Competitiveness Report is increased
- Armenia’s ranking in UN’s E-government readiness index is improved
- Armenia’s ranking in WEF’s Global IT Report is increased

Arrangements for results monitoring

4. Monitoring and Evaluation (M&E) of project components, sub-components and activities will be a streamlined, integrated aspect of project implementation and management. Primary responsibility for results monitoring will fall on the NCFA, EKENG, EIF, with the support of FFPMC.

5. The following results monitoring arrangements are made for this project:

- An M&E training will be conducted by consultants and experts of the World Bank for the responsible agencies and their M&E delegates at the time of project launch. The training will cover the basics of: (a) monitoring and evaluation frameworks; (b) different types of indicators, including impact and outcome indicators; (c) collection efforts; and (d) reporting requirements for the World Bank project.
Data collection and reporting will be the ultimate responsibility of EIF, NCFA and EKENG with the support of FFPMC.

The Ministry of Economy will provide the World Bank with a comprehensive M&E report ahead of every supervision mission, at least semi-annually, showing progress towards project outcomes.

Data collection and reporting should be automated where possible, and be written into the TORs and technical specifications of systems or applications to be implemented by a vendor, where applicable.

Survey-based collection of results data will be included under the project.

The mid-term project review may offer the opportunity to amend the indicator series, or target values based on evolving circumstances.

Independent outcome evaluation will be undertaken at mid-term and at project completion to examine how project benefits are reaching independent beneficiaries.
### Arrangements for results monitoring

<table>
<thead>
<tr>
<th>Project Outcome Indicators</th>
<th>Baseline&lt;sup&gt;56&lt;/sup&gt;</th>
<th>YR1</th>
<th>YR2</th>
<th>YR3</th>
<th>YR4</th>
<th>YR5</th>
<th>Frequency and Reports</th>
<th>Data Collection Instruments</th>
<th>Responsibility for Data Collection</th>
</tr>
</thead>
<tbody>
<tr>
<td>Access to internet services (% of population using the Internet)</td>
<td>15%&lt;sup&gt;57&lt;/sup&gt;</td>
<td>20%</td>
<td>35%</td>
<td>50%</td>
<td></td>
<td></td>
<td>Mid-Term, End of Project</td>
<td>Bi-annual household survey</td>
<td>NCFA</td>
</tr>
<tr>
<td>Access to computers (% of population using a computer)</td>
<td>15%&lt;sup&gt;58&lt;/sup&gt;</td>
<td>20%</td>
<td>35%</td>
<td>50%</td>
<td></td>
<td></td>
<td>Mid-Term, End of Project</td>
<td>Bi-annual household survey</td>
<td>EIF</td>
</tr>
<tr>
<td>Development of Knowledge and Technology intensive industries (Ratio of IT/ITES Sector&lt;sup&gt;59&lt;/sup&gt; revenue in GDP)</td>
<td>1.5%</td>
<td>1.7%</td>
<td>1.9%</td>
<td>2.2%</td>
<td></td>
<td></td>
<td>Mid-Term, End of Project</td>
<td>Ministry of Economy IT Industry Report</td>
<td>EIF</td>
</tr>
<tr>
<td>IT/ITES Sector Employment (number of people)</td>
<td>5,190</td>
<td>5,700</td>
<td>6,300</td>
<td>6,900</td>
<td></td>
<td></td>
<td>Mid-Term, End of Project</td>
<td>Ministry of Economy IT Industry Report</td>
<td>EIF</td>
</tr>
</tbody>
</table>

| Intermediate Outcome Indicators                                                          |                        |      |      |      |      |      |                      |                              |                                  |
| Component 1. E-Society Infrastructure Development                                          |                        |      |      |      |      |      |                      |                              |                                  |
| Residential broadband household penetration                                               | 8.3%<sup>60</sup>      | 10%  | 15%  | 20%  | 25%  | 30%  | Annually              | PSRC annual report            | NCFA                             |
| Business broadband penetration<sup>61</sup>                                               | N/A<sup>62</sup>       |      |      |      |      |      | Annually              | PSRC annual report            | NCFA                             |
| Public sector institutions/offices connected to broadband                                 | N/A<sup>63</sup>       |      |      |      |      |      | Annually              | NCFA survey of government agencies | NCFA                             |
| Price of retail broadband                                                                  | 14%<sup>64</sup>       | 13%  | 11%  | 9%   | 7%   | 5%   | Annually              | ISP publicly                  | NCFA                             |

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<sup>56</sup> Baseline being collected through ongoing study financed under PHRD grant. Baseline and target values are expected to be completed by negotiations.

<sup>57</sup> Baseline is a government estimate, to be confirmed through household survey currently under way.

<sup>58</sup> Baseline is a government estimate, to be confirmed through household survey currently under way.

<sup>59</sup> Includes IT services, Software, ISPs and engineering services. Target values assume 15% annual growth.

<sup>60</sup> Household broadband penetration as of end 2009.

<sup>61</sup> Number of corporate subscribers, data to be obtained from ISPs.

<sup>62</sup> Baseline and targets to be estimated by NCFA prior to project launch.

<sup>63</sup> Baseline and targets to be estimated by NCFA prior to project launch.

<sup>64</sup> Estimated based on a monthly broadband subscription fee of 14,200 AMD and a monthly average salary of 101,800 AMD.
### Component 2. Fostering Enterprise Innovation

<table>
<thead>
<tr>
<th>Metric</th>
<th>2006</th>
<th>2007</th>
<th>2008</th>
<th>2009</th>
<th>2010</th>
<th>2011</th>
<th>Frequency</th>
<th>Reporting Agency</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of Ideas/Matching grants approved</td>
<td>0</td>
<td>3</td>
<td>8</td>
<td>8</td>
<td>8</td>
<td>0</td>
<td>Annually</td>
<td>EIF</td>
</tr>
<tr>
<td>Number of projects financed through the Venture Fund</td>
<td>0</td>
<td>0</td>
<td>1</td>
<td>3</td>
<td>5</td>
<td>3</td>
<td>Annually</td>
<td>Venture Fund</td>
</tr>
<tr>
<td>Number of projects prepared and presented to potential investors</td>
<td>0</td>
<td>0</td>
<td>3</td>
<td>9</td>
<td>15</td>
<td>9</td>
<td>Annually</td>
<td>EIF</td>
</tr>
<tr>
<td>Number of enterprises benefited from GTC</td>
<td>0</td>
<td>0</td>
<td>10</td>
<td>20</td>
<td>35</td>
<td>50</td>
<td>Annually</td>
<td>EIF</td>
</tr>
<tr>
<td>Occupancy rate of GTC</td>
<td>0</td>
<td>0</td>
<td>10%</td>
<td>30%</td>
<td>60%</td>
<td>80%</td>
<td>Annually</td>
<td>EIF</td>
</tr>
<tr>
<td>Export of IT/ITES sector (million USD)</td>
<td>71.56</td>
<td>94</td>
<td>109</td>
<td>125</td>
<td>144</td>
<td>165</td>
<td>Annually</td>
<td>Ministry of Economy IT Industry Report</td>
</tr>
<tr>
<td>Number of sales and investments generated by the representative office (million USD)</td>
<td>0</td>
<td>0.28</td>
<td>0.66</td>
<td>0.81</td>
<td>0.97</td>
<td>1.15</td>
<td>Annually</td>
<td>Sales Office reports</td>
</tr>
<tr>
<td>Labor productivity in IT/ITES sector (thousand USD per employee)</td>
<td>25</td>
<td>30</td>
<td>33</td>
<td>36</td>
<td>39</td>
<td>43</td>
<td>Annually</td>
<td>Ministry of Economy IT Industry Report</td>
</tr>
<tr>
<td>Number of manpower trained and certified under the project (number of people)</td>
<td>0</td>
<td>100</td>
<td>100</td>
<td>150</td>
<td>150</td>
<td>150</td>
<td>Annually</td>
<td>EIF</td>
</tr>
</tbody>
</table>

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65 Household survey under way. 10% estimated PC penetration for 2008.  
66 Computers sold under Computer for All pilot (6 months prior to project appraisal).  
67 Includes IT services, software, ISPs and engineering services (2009 data from MinEcon IT Industry Report). Target values assume 15% annual growth.
Annex 4: Detailed Project Description
Armenia E-Society and Innovation for Competitiveness Project (EIC)

1. It must be noted that the GoA has requested and obtained a Project Preparation Advance (PPA) to complement the PHRD grant and advance limited project implementation in a number of priority areas, notably the Digital Citizen and Computer for All programs, under sub-components 1.2 and 1.3, respectively. The PPA also includes some of the technical assistance described below for subcomponent 1.1 and for component 2.

COMPONENT 1: E-Society Infrastructure Development (US$ 12.7 mln)

2. The objective of this component is to increase access to affordable broadband services for citizens, businesses and public institutions, to equip citizens and businesses with a tool for identification and authentication for electronic transactions and to increase access to affordable computers, content and e-services for citizens.

3. To achieve this objective, this component will provide financing to support the design and development of the Armenian ICT infrastructure required for e-society through:

   a. **Nationwide Broadband Backbone and Government Network.** This sub-component will support deployment on a PPP basis of a nationwide broadband backbone network, which will facilitate broadband access throughout the country including in rural areas and with adequate international linkages, as well as with the necessary connections for public institutions throughout the country (government virtual private network). The sub-component will also provide necessary technical assistance for regulatory framework and backbone implementation.

   b. **Digital Citizen Program.** This sub-component will support the implementation of the Digital Citizen Program aimed at the development and distribution of electronic identification documents to equip citizens with a tool for identification, authentication and electronic signatures. As part of this sub-component, a Certification Authority for electronic signatures will also be established.

   c. **Computer for All Program.** This sub-component will promote increased computer penetration and digital literacy through a Computer for All Program, which will be financed through a Line of Credit for the Computer for All Program.

Sub-component 1.1: Nationwide Broadband Backbone and Government Network (US$ 7.9 mln)

4. The objective of this sub-component is to support the development of a world class ICT infrastructure serving major regions, communities, government and local self-government bodies and private industry in Armenia. This objective will be achieved through the roll-out on a PPP basis of a national broadband backbone network with adequate international linkages. The national backbone network will be the main platform for increased broadband access in rural areas, and in parallel will support the creation of a government virtual private network to provide
Internet connectivity to priority target users, including government agencies, schools and health care facilities throughout the country.

5. This sub-component will include the following activities among others:

**Activity 1.1.1: Technical Assistance for telecommunications regulatory framework and backbone implementation (US$ 0.4 mln)**

6. The project will build and complement technical assistance being provided by USAID in the telecommunications and broader ICT sector for legal and regulatory work. While USAID support encompasses a broader set of issues, including e-commerce legal and regulatory matters, the project will focus on financing consultancies aimed at modernizing the legal and regulatory framework for the telecommunications sector, in light of the international trend towards technological convergence between the telecommunications, IT and media sectors. The project will also provide ongoing technical assistance for the implementation of the bidding processes aimed at deploying the backbone network. An assessment of security issues related to the backbone network will be conducted, including an evaluation of the need to establish a Critical Information Infrastructure Protection (CIIP) system or a Computer Emergency Response Team (CERT) for broader ICT security issues. Support would be provided, among others, for: (i) further fine-tuning the regulatory framework for universal service, building on the work done under a PPIAF grant, to ensure private sector-led investment in provision of telecommunications services in rural areas, including addressing the issues of the radio spectrum, numbering plan, with an option for number portability; (ii) developing the regulatory framework for infrastructure sharing and open access, including regulation of bandwidth pricing, as well as to remove any remaining bottlenecks for a level playing field in international connectivity; (iii) developing adequate environmental guidelines for implementation of ICT infrastructure projects; (iv) preparing the Broadband Networks Operational Manual, finalizing the bidding documents and supporting the implementation of the bidding processes for the broadband backbone network and government private network, including an adequate communications campaign, as well as financing the cost of an independent verification agent to confirm that the construction and service delivery milestones have been met; and (v) providing technical assistance and capacity building support to the NCFA, to adequately respond to the challenges posed by convergence.

**Activity 1.1.2: Nationwide broadband backbone and government network development (US$ 7.5 mln)**

7. The project will provide financing for the public sector contribution that may be required for a primarily private sector-led deployment of a nationwide broadband backbone network that would reach the majority of 923 communities (hamaynk) in the country, including 100% of the 46 cities (kaghak). According to a study funded under the PHRD grant, the proposed backbone network would imply the roll-out of close to 600 km of fiber throughout the country. The network will also include last mile connectivity for public institutions throughout the country, including government offices, schools, hospitals, etc. The backbone network will be designed to enable for the future provision of retail broadband services with 100Mbps capacity. The government is also considering the option of reserving capacity or dark fiber on the backbone for the future creation of a National Research and Educational Network (NREN), in support of the
objectives of improving innovation in Armenia (see component 2). The public sector contribution will be structured as a combination of: (a) financial support to a winning bidder under an Output-Based Aid (OBA) tendering process; and (b) long-term commitment to pre-purchase capacity on the backbone for the provision of services to government. The PPPs will be implemented on the basis of performance-based contracts, following OBA approaches, whereby funds are disbursed on the basis of construction and service delivery milestones explicitly specified in the contract, and confirmed by an independent third party verification agent prior to disbursement. A Broadband Networks Operational Manual will be prepared detailing the flow of funds under this arrangement; the roles and responsibilities of the various parties involved, and will include as annexes the TORs for the independent verification agent and the necessary bidding documents, among others. The activity will be managed by NCFA on the basis of a Subsidiary Finance Agreement to be signed between NCFA and the Borrower. Terms and conditions of the PPP contracts will be outlined in the Operational Manual and detailed in the corresponding Broadband Networks Financing Agreements to be entered into between NCFA and the Beneficiaries.

8. Given the international experience with PPPs in telecommunications, the project will support the deployment of the backbone on a PPP basis, which will entail a robust contract structure where there would be an appropriate risk transfer to the private operator. The backbone network will be implemented on an open access basis designed in such a way that: (a) it does not constrain the development of private-sector competition from other backbone providers and promotes the development of competition in other market segments; (b) the private sector plays the central role in construction and operation of the network; and (c) the level of public financing required for the network is minimized.

9. The government intends to consolidate existing budgetary resources for telecommunications services through bulk purchase of capacity and communications services that would be based on the nationwide backbone network, to serve the connectivity needs of the government agencies and other priority target users for their own internal use and for provision of online services to citizens and businesses. In this context, the priority target users of this Government Virtual Private Network (VPN) include government agencies, schools and health facilities throughout the country. This activity may be implemented as a separate tendering process, or may be bundled with the implementation of the backbone network, bearing in mind that it involves not only the pre-purchase of the backbone capacity, but also the need to plan for the last mile connectivity.

Sub-component 1.2: Support to Digital Citizen Program (US$ 1.3 mln)

10. The main objective of this sub-component is to enhance trust and security in the provision of electronic services and hence promote further uptake of electronic services by citizens and businesses. This will be achieved through support to the creation of a national certification authority for electronic signatures, to be established on the basis of the Ministry of Economy’s E-Governance Infrastructure Project Implementation Unit (EKENG). The use of electronic signatures will provide citizens and businesses with a tool for electronic authentication for online transactions.
11. In addition, the government plans on further extending the use of electronic signatures through a parallel initiative funded from GoA own resources to develop and distribute electronic identification cards and biometric passports (e-ID documents), which will contain electronic signatures embedded in them, while at the same time explore innovative approaches like mobile ID solutions.

12. The objective is to modernize the population registry system and facilitate enhanced G2B and G2C online public services, using electronic signatures. It is expected that the e-ID card would include the necessary certificates to allow citizen access to multiple government systems, both on the web and in person, including electronic pension account management, healthcare system, among others, and serve as the platform for rapid development of e-banking and other e-commerce services. Adequate privacy safeguards will be implemented with the system to minimize risk of inappropriate use of the data.

13. The e-ID document system will be implemented on a PPP basis (on a Design-Build-Maintain approach) with a private vendor to implement and roll-out the e-ID document system. The core elements of the e-ID document system infrastructure include: a) Enrollment system, comprised of 61 enrollment stations throughout Armenia, which will be used to capture biometric data from the citizen compliant with international standards, fill in the electronic application form, and transfer the application and biometric data over a secure channel to the personalization system; b) Personalization system, which will serve as the basis for issuing biometric passports and e-ID cards, will handle all the card and passport personalization functions, and will also include an e-ID Document Production Subsystem and a User Management System to centralize the e-ID document production and handle all the officer management tasks, respectively; and c) Issuance of e-ID documents, which will be purchased in bulk from a competitively selected vendor and personalized through the subsequent application of the enrollment and personalization systems. The GoA plans to issue at least 200,000 e-ID cards per year, and at least 75,000 biometric passports the first year.

14. This sub-component will finance the following activities:
Activity 1.2.1: Technical Assistance for the Certification Authority and e-ID document system (US$ 0.4 mln)

15. This activity will finance technical assistance to support the establishment and operation of the Certification Authority. This will include conformance testing of the equipment purchased, further customization and configuration of software and hardware, and development of policies and procedures for the Certification Authority.

16. The project will also provide limited support for GoA’s initiative to establish and roll out on a PPP basis a secure and reliable authentication infrastructure (e-ID document system) for electronic transactions. In this context, the project will finance Technical Assistance to support implementation of the e-ID document system, by providing independent testing and verification of the functionality and security of the system, with the bulk of the investment funding for the system itself coming from GoA own resources.

17. The project will also include support for a communications and marketing campaign.

Activity 1.2.2: Establish Certification Authority (US$ 0.9 mln)

18. In order to introduce e-ID documents for citizens with an embedded digital signature, it will be necessary to establish the organizational and technical infrastructure for dealing with digital signatures and certificates. Armenia has established a Government-owned Joint-Stock Company, the E-Governance Infrastructure Project Implementation Unit (EKENG in Armenian), to serve as Trusted Root Certification Authority (CA) for all subordinate CAs and to implement a PKI infrastructure to issue certificates and digital signatures to be uploaded to e-ID cards. The project will finance a turnkey contract, which will include the necessary information technology goods and services, customization and training for establishing the Certification Authority. The technical specifications for the equipment have been prepared. It is expected that the bidding process can start prior to project effectiveness, and could be financed out of the PPA.

Sub-component 1.3: Computer for All Program (US$ 3.5 mln)

19. The overall objective of this sub-component is to increase computer usage in Armenia by offering to the population modern computers equipped with software and content at affordable prices. In particular, this sub-component will aim to increase the level of computer penetration in Armenia thus ensuring a sustainable, computer literate workforce; promote the Armenian ICT market by stimulating the development of the local hardware and software industries; increase Internet penetration and the number of people using online services, thus creating the basis for the introduction of new electronic services by the Government, businesses, educational institutions; and decrease the software piracy rate in Armenia through offering licensed preinstalled software package. The target of the program is to reach purchase rates of at least 10,000 computers per year. The program will be implemented through a PPP between the Government of Armenia, Enterprise Incubator Foundation, commercial banks, technology vendors, and their local distributors and retailers, and will remain open to other vendors and service providers, including telecommunications operators.

20. This sub-component will include the following activities among others:
**Activity 1.3.1: Line of Credit for the Computer for All Program (US$3.0 mln)**

21. A key element of the Computer for All Program, which will be financed under the project, will be a line of credit (LOC) to small borrowers through private financial institutions (PFIs) acting as financial intermediaries as per the guidelines of OP 8.30, para. 19. The Program will be structured as a PPP. In financial terms, the government’s contribution to the PPP will be the LOC and the private sector financial contribution will be made by participating PFIs on a 50/50 basis with their own capital.

22. **Overview of flow of funds**: Participating PFIs will pre-finance the Program through two vehicles: a) providing commercial loans to wholesale computer distributors (logistic centers) for the purchase of eligible goods (as defined below) in bulk for further resale through participating retailers, to ensure economies of scale and lower prices; and b) providing consumer credit to individuals for the purchase of eligible goods (using the same definition) through participating retailers. The eligible goods will constitute desktop or laptop computers, and related information technology equipment, bundled with other products and services such as software, content, internet access, and training tutorials. The detailed definition of eligible goods will be contained in the Computer for All Operational Manual.

23. Participating PFIs will advance funds of their own to issue loans to consumers and wholesalers for the purchase of such goods. On a monthly basis, upon the request of the PFIs and confirmation by EIF (as manager of the Program), FFPMC will reimburse the PFIs on the basis of actual loans signed and documentation showing that the eligible goods were indeed purchased with those loans. Given that participating PFIs will have committed to contributing half of the funds out of their own resources, the reimbursement will only be for 50% of the loan amounts. The terms and conditions and details of the interaction between FFPMC, EIF, Central Bank of Armenia (CBA) and the participating PFIs will be outlined in the Operational Manual and further detailed in the Master Loan Agreements (MLAs) signed by all four parties. The diagram below summarizes the flow of funds under the Program.
24. The funds will be available nationwide and participating PFIs will be selected by the Borrower in accordance with CBA and World Bank guidelines, as outlined below. It is anticipated that a minimum of two banks will participate in the program complementing the LOC with their own additional resources. At a minimum, this contribution will match the US$3 million provided under the project. However, it is estimated that the PFIs contribution to the program could reach as much as US$ 5 million per year.

25. Terms and conditions of MLAs and Sub-Loans. A market based interest rate structure will be used by PFIs in the provision of sub-loans to wholesale computer distributors and consumers. Currently suggested conditions by PFIs for consumer loans assume 24 month credit term or 1 month cash installment and no upfront payments. PFIs will be bearing credit risk and will be responsible for repayment of the loan to the government. The CBA will provide qualified PFIs with a five year revolving facility, in accordance with the MLA. The CBA will offer AMD funding to PFIs on a variable rate, based upon the mid-point between the re-financing rate and the five year sovereign bond yield. The project will provide technical assistance to PFIs to improve market prospects and operational capacities such as marketing and awareness building, risk management and logistics supported by use of information system, but it will not provide any interest rate subsidies or differentiated cost of computers to consumers. The IBRD loan will be passed on to PFI’s and final borrowers in local currency, therefore not triggering foreign exchange risk.

26. Eligibility and monitoring of PFIs. The eligibility criteria for PFIs are defined in the Computer for All Operational Manual and are in compliance with OP 8.30. PFIs will be required to (i) demonstrate adequate profitability, capital and portfolio quality as confirmed by audited financial statements prepared and audited acceptable to the WB, (ii) acceptable level of loan collections, (iii) appropriate capacity for implementation, (iv) capacity to mobilize domestic
financial resources, (v) managerial autonomy and commercially oriented governance, (vi) appropriate prudential policies, administrative structures and business procedures.

27. Financial performance indicators for PFIs will be used for M&E along with project performance indicators. Indicators will be agreed during project negotiations, described in the Computer for All Operational Manual and reported during project implementation on an annual basis. These indicators will include financial sustainability of PFI, capital adequacy, and profitability (ROA), quality of portfolio administration.

28. *Technical aspects of the Program.* The following describes the various elements of the program, as depicted in the diagram below, and further explained in the Operational Manual:

i. *Vendors,* selected on a competitive basis for participation in the program, are responsible for building and managing the manufacturing, distribution of computers, and their delivery to Armenia, as well as assistance in development and implementation of an online CRM portal.

ii. *Logistic Center,* are local wholesalers, distributors or dealers, who manage a local logistic stock of computers. The distributors or dealers play a key role within the distribution network and are responsible for periodic ordering of computers from international vendors based on the analysis of current and projected sales, customs clearance and transportation of the stock to the relevant logistic stock, monitoring of the retailers and their sales, contract processing, and payment of commissions to the retailers, providing technical and maintenance services to the customers as part of the warranty, invoicing the program management unit and receiving payments from it, and maintaining the online reporting tool. The logistic stock is composed of regional centers where computer stock for the particular region is stored. These centers will be located at key retail partners that will also provide, in addition to stock maintenance and retailing, basic computer maintenance and warranty services to the customers.

iii. *Retailers or POSs* will be mostly either specialized computer stores or electronics shops that have experience with selling and providing basic service options for computer equipment. It is envisaged that the retailers will be trained in order to provide quality sales and support services to the customers. Retailers (electronics/computer stores) are located throughout Armenia and responsible for: providing high-quality retail services to the customers, assisting in customer credit approvals, reporting sales and other relevant information through the online portal.

iv. *Program management unit (PMU)*, run by EIF, manages the Computer for All Program and is responsible for developing and managing of the entire program and its separate components, working with the Government and the donors on various program related issues, managing the Revolving Fund in the most effective and efficient manner, monitoring sales, shipments, credits, and other factors to meet the program goals, paying through the logistic center for all shipped computer at agreed dates.
v. *Commercial banks* are responsible for assisting PMU and program partners in developing a viable credit financing mechanism, conducting credit checks and issues credit approvals to relevant customers through the online CRM portal, developing credit agreements with the approved customers, monitoring the credit payments by the customers, transferring credit funds at agreed dates to the PMU.

29. The Operational Manual for the Computer for All Program details the criteria for selection of banks, vendors and other program partners, including procurement and disbursements arrangements. Specifically, the Manual addresses the following: (i) Program Management mechanism, and program governance; (ii) Implementation Plan; (iii) Terms and conditions of MLAs and sub-loans; (iv) supporting infrastructure, eligibility criteria for partners and implementation logistics, including CRM, Logistic Center, and Points of Sale, among others.

*Activity 1.3.2: Technical Assistance to Implement the Computer for All Program (US$ 0.5 mln)*

30. The project will also finance technical assistance for the ongoing implementation of the initiative, including support for public information campaigns, training, etc. This activity will support development and management of the entire program, including maintenance and management of the CRM portal, the program’s website; supporting a PR communications and marketing campaign; monitoring shops (POSs) participating in the program to ensure they adhere to the program and contractual obligations; conducting periodic training of shop
personnel; providing call center assistance to customers and shops; developing strategy and partnerships for appropriate content development; and conducting periodic surveys on program implementation.

COMPONENT 2: Fostering Enterprise Innovation (US$ 10.2 mln)

31. The objective of this component is to promote the creation, growth and competitiveness of knowledge and technology-driven enterprises68, while at the same time encouraging traditional sectors to adopt new technologies. This component will focus on supporting programs, financial mechanisms and infrastructure that will create a favorable environment for knowledge and technology-driven companies, by financing activities under the following three sub-components:

a. Financial Support for Innovation in Knowledge and Technology-intensive Firms. This sub-component will finance: (i) Ideas generation mini grants ($2-10 k) for business plan and proof of concepts for innovative ideas, and innovation matching grants for product or process adaptation, improvement and development ($10-150k); (ii) public contribution towards establishing a Seed and Early Stage Venture Fund, including management team remuneration; and (iii) Innovation Brokerage Team remuneration.

b. Establishment of Gyumri Technology Center. This sub-component will finance works, goods and consulting services for the establishment of a technology center in Gyumri to provide technology support and incubation services to local firms and entrepreneurs as an important piece in the government’s strategy for regional economic development in the Gyumri marz.

c. Support to IT/Knowledge-intensive Industry Development. This sub-component will finance activities aimed at enhancing the competitiveness of Armenian IT and knowledge-intensive firms by: (i) promoting international sales and foreign direct investment, through a Silicon Valley Sales Force Representation Office and managerial secondments; and (ii) facilitating access to know-how and new technologies and promoting productivity improvements, through technical assistance and training for skills development and certification.

Sub-component 2.1: Financial Support for Innovation in Knowledge and Technology-intensive Firms. (US$ 4.7 mln)

32. The objective of this sub-component is to stimulate the rate of technology absorption, technology transfer, innovation and commercialization in the private sector, foster collaboration between research and industry, and promote the development of new knowledge- and technology-driven companies across Armenia, including a regional innovation promotion emphasis in the Gyumri region.

68 Knowledge and technology-driven enterprises include technology-based firms (e.g. IT firms), as well as firms that compete on the basis of product, process or service innovation. Innovation can be either incremental or radical, and either new to the Armenian market or new to the world.
33. This sub-component will finance: (i) *Ideas generation mini grants* ($2-10 k) for business plan and proof of concepts for innovative ideas, and *innovation matching grants* ($10-150 k) for product or process adaptation, improvement and development; (ii) public contribution towards establishing a Seed and Early Stage Venture Fund, including management team remuneration; and (iii) establishing and remunerating an Innovation Brokerage Team.

**Activity 2.1.1: Ideas Generation Mini Grants and Innovation Matching Grants (US$ 1.0 mln)**

34. Enterprise Incubator Foundation of Armenia, initially established as a foundation under the 2001 World Bank project, has demonstrated expertise in the screening and selection process for similar programs (Microsoft Innovation grants, Science Technology Entrepreneurship program, etc.) and has the capacity to administer and monitor this program. EIF is therefore proposed as a candidate to operate the Ideas Generation Grants and Innovation Matching Grants.

35. The Ideas Generation Grants and Innovation Matching Grants program will be administered through national competition across Armenia, providing up to US$ 900,000 in grants financed under the Project. Among these, in support of the Government’s objectives to promote regional development, the Project has earmarked up to US$ 200,000 in Matching Grants for firms in the Gyumri region. A *steering board*, preferably the same as the steering board for the Seed and Early-Stage Venture Fund (see activity 2.1.2) will be used to oversee the management of the Ideas Generation Grants and Innovation Matching Grants.

36. Both kinds of Grants will be managed as a single program with different beneficiary eligibility criteria, maximum size of grants and eligible expenditures, as described in the Grants Operational Manual. In both cases, eligible expenditures will be goods and services, as further described in the Grants Operational Manual. No works will be financed through the grants. Subprojects financed by these Grants will be selected on the basis of competitive calls for proposals. In the case of innovation matching grants, the beneficiaries will be expected to match the Grants with an equal amount of resources from their own resources. The Grants will be managed by EIF on the basis of a Subsidiary Finance Agreement to be signed between EIF and the Borrower. Terms and conditions of the Grants will be outlined in the Operational Manual and detailed in the corresponding Grant Agreements to be entered into between EIF and the Beneficiaries. Any advanced funds not invested in subprojects prior to the closing of the project would be returned to the World Bank.

37. This activity will include the following:

1. *Ideas Generation Grants* ($2-10K). The objective of the *Ideas* mini-grant program is to determine the commercial feasibility of innovative ideas. The program will provide grant financing in the range of $2-10K to enable students, scientists, entrepreneurs to demonstrate the technical feasibility of their laboratory discoveries or process solutions. The purpose is to enable them to develop a business plan and detailed marketing strategy. The grants will be awarded on a competitive basis. Grant applications will be peer reviewed by Armenian and international technology and commercial experts.
ii. **Innovation Matching Grants ($10-150K).** The objective of Innovation Matching Grants is to convert research into commercial applications by supporting two types of activities in enterprises: (i) advanced activities in research that can lead to full prototype development; (ii) adoption of existing technologies, product and process improvements, through appropriate technology transfer. Some of these grants will be collaborative in nature. These collaborative grants are intended to promote joint research of Armenian firms and both domestic and foreign industry, as well as research institutions. Armenia’s research institutes and universities need help in obtaining contracts for joint research with industry, outsourced corporate R&D, and new product development.

**Activity 2.1.2: Seed and Early-stage Venture Fund (US$ 3.3 mln)**

38. This activity will pilot a Seed and Early-Stage Venture Fund (the “Fund”) that would comprise a limited public contribution of up to US$ 3 million, financed under the project, and up to one half of the total fund equity. This activity also will complement to Access to Finance for SME Project which aims to widen the access to finance for small and medium enterprises in Armenia’s financial sector.

39. This pilot fund would provide a demonstration effect of the commercial viability of early stage funds for technology and high growth potential knowledge-based start-ups helping attract Venture Capital (VC) funds and creating a critical mass of early stage investments and market agents such as lawyers and management consultants. The legal framework for VC funds is considered to be sound and will be verified by the review conducted under this subcomponent. The Fund would be established as an independent legal entity with the purpose of making equity investments in early stage technology and knowledge-based companies, and would be privately managed.

40. The fund manager would be responsible *inter alia* for actively seeking deals, presenting them to the investment committee, monitoring performance of approved investments, supporting portfolio companies and regularly informing the steering board on the fund’s performance. The fund would have a steering board where private investors and representatives of the Ministry of Economy would participate according to the share of equity investments. The steering board will establish guidelines for the Funds’ investments and participation of investors in Fund equity. An investment committee will have the authority to make all investment decisions. The investment guidelines would follow commercial practices common to venture capital funds, contain financing limits per company, and restrictions on lending to related parties. The investment committee would report to the steering board for information. In addition, the steering board would receive reports from an annual independent audit that would have the responsibility to ensure that the service agreement is being followed and transparency in information and decision criteria is being achieved within the limits of commercially sensitive disclosure. The annual

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69 Although no universal definition exists, we view seed and early-stage investments as first and second rounds of institutional funding for companies less than 5 years old and not part of a larger business group. They are typically small, rarely exceeding $200,000 and thus generate disproportionately large transaction costs justifying initial public subsidy.
independent audit, which is common practice in the VC industry, would also help the World Bank’s monitoring of the Fund. Subprojects financed by the Fund would have to comply with commercial practices acceptable to the World Bank, environmental and social safeguards and the negative list contained in the Fund Operational Manual.

41. The Fund is expected to produce commercial returns in 8-10 years after creation, in line with international experience, meaning several years after the project is closed. After this period, the fund may be liquidated and equity contributions and commercial gains would be returned to investors. The draft by-laws, investment guidelines and Operational Manual of the Fund would be cleared by the World Bank. Up to US$ 1 million could be advanced to the Fund Account once the disbursement condition is met, namely the private manager for the Fund has been selected, the draft by-laws, investment guidelines and Fund Operational Manual acceptable to the Bank have been adopted, the Fund has been incorporated, and the private investors have committed resources to the fund.

42. The financing advanced to the Fund will be considered eligible expenditures once the VC Fund invests them in subprojects for eligible expenditures, as reported in the Fund’s annual external audit. Any advanced funds not invested in subprojects prior to the closing of the project would be returned to the World Bank. The full description of Fund governance, eligible subprojects and expenditures, and flow of funds will be further defined in the Seed and Early-Stage Venture Fund Operational Manual. This activity will be managed by the Fund on the basis of a Subsidiary Finance Agreement to be signed between the Fund and the Borrower. Terms and conditions of the financing to be provided by the Fund will be outlined in the Seed and Early-Stage Venture Fund Operational Manual and detailed in the corresponding Sub-financing Agreements to be entered into between the Fund and the Beneficiaries.

43. If the private financing that had been initially committed is not disbursed to the Fund within the period agreed with the investor, the public contribution would be reduced accordingly (to maintain the one-half ceiling). In addition, if a minimum amount of private sector investment has not been raised by a given period (both amount and period are defined in the Seed and Early-Stage Venture Fund Operational Manual based on inputs from the PHRD grant) then resources allocated to the Fund will be reallocated to another activity. Under the same PHRD grant a consultant with international experience is hired to design the Fund operation which, inter alia, will describe the process of attracting and maintaining the interest of private investors in the Fund.

44. This activity complies with the objectives of the OP 8.30, in particular financing real sector investment needs and promoting private sector development (in this case new technology and knowledge-based sectors) and fostering the development of participating financial intermediaries (in this case venture capital funds). The design and governance features of the proposed Fund will ensure that the Fund complies with OP 8.30 guidelines. The establishment of the Fund will require a government decree.

45. **Fund Management Team.** The Project will provide an up to 50% contribution towards the management fee of the Fund. While the exact management structure and incentive scheme is to be further defined in the Fund Operational Manual the fixed management fee financed under the project is estimated at approximately US$ 300,000 for four years of operation to be provided on
a sliding scale basis to assure sustainability of the Fund after the project’s closure (e.g. from 75% in year 1 to 25% in year 4).

46. The selection process for the management team of the Fund would take place through an international competitive selection process. The evaluation committee would include both international and national expert(s). The competitive selection may include as one of its key criteria the amount of equity the private management agent proposes to bring to match public funds. Using this and other criteria covering, for example, the experience and skills of the proposed team, the proposals would be ranked. The highest ranked proposal would then be invited to negotiate the management contract.

**Activity 2.1.3: Innovation Brokerage (US$ 0.4 mln)**

47. This activity would seek to catalyze a market for specialized business development services that are able to transform technology and innovation ideas into commercial projects acceptable for early stage venture capital or other investors. The key lesson from other countries that have attempted to introduce early stage funding pinpoints to the need of parallel activities that will facilitate the availability of “deal flow” i.e., investment ready projects. Recognizing this, the subcomponent would support the formation of innovation brokerage team that would assist an entrepreneur in all stages of the incubation cycle. More specifically, the functions of the “deal flow” promoters would comprise (i) assessing the technological viability of the project; (ii) estimating the commercial potential of the innovation; and (iii) generating, presenting and marketing new information about the project.

48. By contrast to existing incubation structures, the innovation brokerage team would be remunerated on a combination of a flat-fee and a success-fee basis, providing the incentives for agents to actively seek out and nurture technological ideas with commercial potential and identify external finance.

49. The innovation brokerage team would be a team of consultants selected through a competitive bidding process. The evaluation committee would include both international and local expert(s).

50. To simplify contractual arrangements, deal flow generation in Armenia will consist of the following elements/principles (amounts provided for illustration purposes):

- A basic flat management fee for running the project management facility of up to US$ 400,000

- A success fee based on:

  - Funded business plans: a fee per each business plan prepared and funded by investors in the amount of $20,000 per proposal (to be financed by the project or other sources), but not more than for 5 business plans per year

  - Raising investments: 12% of total investment committed to a deal, but not more than $250K per year. This success fee does not preclude innovation brokers’ participation
in the equity of the company created and participate in any other way in the upside potential of the company.

- Contracts generated between businesses and research institutions (universities and public research institutes) in the amount of 10% of the contract size not to exceed $100K per year.

51. The total amount of the public remuneration consultants receive for the deal flow facility cannot exceed US$ 800,000 during the life time of the project. Given the uncertainty regarding the possibly flow of deals, the innovation brokerage team will be small (2-3 brokers) in the early stages of the project, and will be scaled up as the flow of eligible investment opportunities increases.

Sub-component 2.2: Establishment of Gyumri Technology Center (US$ 2.9 mln)

52. The objective of this sub-component is to provide Gyumri firms and entrepreneurs with access to know-how, services and facilities which are currently unavailable in the Gyumri region. This sub-component will provide support for firms (both existing and start-ups) with potential to grow and compete initially in local and eventually in international markets on the basis of technological upgrading. This will be achieved by facilitating firms’ access to knowledge and supportive technology infrastructure.

53. The Gyumri Technology Center (GTC), established as a Foundation, will offer technology extension services, training, technology support facilities and an incubation program to firms and potential entrepreneurs in the Gyumri area. GTC will also offer facilities for regional economic development programs sponsored by other organizations. A detailed description of program offerings will be included in the Project Implementation Plan and will reflect findings of the feasibility study and business plan developed under the PHRD grant.

54. GTC will facilitate the emergence of innovative start-ups during the early stages of development, when they are most vulnerable to market risks and face a steep learning curve. It will provide technological support and workforce training to SMEs in the region, most of which are currently unaware of their technological needs and have difficulty accessing and absorbing relevant technologies and know-how. It will foster knowledge and business linkages among firms, universities and sources of finance both within and outside the region. It will also foster the development of a market for business and industrial development services by drawing on external private and academic organizations to provide services to firms. This subcomponent will finance the following activities:

Activity 2.2.1: Establishment of Gyumri Technology Center (US$ 2.2 mln)

55. This activity will include the following:

i. **Refurbishment of the building to house the Gyumri Technology Center:** The government will assign to GTC an existing government-owned building of approximately 5,000 square meters. The building will require major refurbishment. This activity will finance civil works in an estimated amount of US$ 1.7 mln.
Refurbishment will be conducted on the basis of an engineering design developed under the PHRD grant.

ii. *Office Furniture, LAN and Equipment:* Upon completion of civil works, this activity will finance US$ 0.5 million of capital goods required for GTC management offices and programs hosted by GTC, as described in the Operational Manual. These goods will include a local area network (LAN) for the entire facility, as well as furniture and office equipment for GTC and individual program management purposes, as well as furniture and office equipment for technical support and training purposes. Goods will also include specialized technological equipment for program purposes described in the Operational Manual.

**Activity 2.2.2: Support to Gyumri Technology Center Operation (US$ 0.5 mln)**

56. This activity will include the following:

i. *Technology Center Manager:* This activity will finance the remuneration of a full-time Technology Center Manager in the amount of US$ 0.1 mln for a three-year period. The Manager will be responsible for administrative, operational, financial and legal issues related to GTC. The Manager will also be responsible for marketing GTC, for raising funds for programs, operational costs and capital expenditures, and for forging relations with the community. The Manager will be responsible for implementing the programs described in the Operational Manual. The GoA will cover the salaries of at least two full-time deputies to assist the Technology Center Manager.

ii. *Building the Capacity of the Management Team:* This activity will finance consulting services for the development of the skills and knowledge of the management team up to US$ 0.1 mln. The management team includes the Technology Center Manager, as well as the GTC deputy managers and the managers of the programs financed by the Project, as defined in the GTC Operational Manual. Covered activities will finance training, mentorship, twinning programs, consulting and participation in international incubation and SME support center networks in Armenia and abroad. This activity will not cover the salaries of the management team, except for the manager, as indicated above, since these costs will be contributed by the GoA state budget.

iii. *Operating expenses.* This activity will finance operating expenses for the GTC including utilities, office supplies and maintenance costs for an amount of US$ 0.3 million over three years, starting in the second year of the project. Funding will be provided in a declining scale over the three year period so as to create incentives for financial sustainability.

**Activity 2.2.3: GTC Technology Extension Program (US$ 0.2 mln)**

57. This activity will support the design and provide co-financing with government for a business development services program aimed at upgrading the technological capabilities of
SMEs in the region over a three year period. Services include advice, technical support and training services provided both directly by program staff itself as well as by third-party service providers. The exact mix of services, the service delivery model and the organizational structure of the program is described in the GTC Operational Manual (internal GOA documents). These draw on the GTC feasibility study financed under the PHRD grant, as well as from international best practices in technology extension programs. The activity will finance the program management team and third-party contracts required for program delivery.

**Sub-component 2.3: Support to IT/Knowledge-intensive Industry Development (US$ 2.60 mln)**

58. The objective of this sub-component is to enhance the technological absorptive capacity and innovation in existing firms and the growth of knowledge and technology-driven firms. The sub-component will promote enterprise-led innovation by supporting skills and technology development, and firms’ linkages with demanding international markets and Armenian research capabilities. This will be achieved by facilitating firms’ access to foreign markets, knowledge and business services.

59. This sub-component involves a series of measures aimed at increasing the competitiveness of IT and knowledge-intensive firms by enabling access to know-how and new technologies, promoting productivity improvements as well as facilitating the operation of the Armenian IT Sales Force Representation in Silicon Valley to promote products of the Armenian IT/Knowledge-intensive industry and measures aimed at improving the managerial capabilities of entrepreneurs in the Armenian IT and knowledge-intensive sectors. This will involve the following:

**Activity 2.3.1: Industry promotion and managerial secondment (US$ 1.05 mln)**

60. The main objective of this activity will be to identify demand for Armenian IT products and establish a niche in which Armenia can play a global role, building on the successful experience of EIF. This will involve the following:

i. **Sales Force Representation in Silicon Valley.** This activity, estimated at US$ 0.6 million, will support the establishment of the Armenian IT/Knowledge-intensive industry Sales Force Representation Office in Silicon Valley, through co-financing with the private sector in a PPP modality of consulting services for managing the representation office. The government portion of the PPP, financed through the project, would be contingent on available private sector co-financing, as per the requirements established in the Sales Force Representation Office Operational Manual, acceptable to the Bank. Specific functions of the representation office would include IT and knowledge-intensive sector promotion and other image building activities, identification of export and FDI opportunities, matchmaking, lead generation, supporting exporters in their export activities. By base scenario in 5-year perspective one representation office is forecasted to generate 2.5 mln USD deals for Armenian IT companies, with 9.7 USD generated sales per USD spent. The cumulative subsidy need by the representation office will count up to 260 thsds USD. In the base scenario case the annual funding need will decrease over
the years and account only about 20,000 USD in the fifth year. In the optimistic scenario the Project may become sustainable covering the total costs from generated revenues after 4th year of operation.

ii. Managerial Secondments. This activity will also co-finance secondments or internships of management of local companies to identified companies in Silicon Valley, and other major target markets for Armenian IT products and services. The objective will be to expose Armenian managers to managerial practices in the target markets, establish contacts and generate leads for future business. These secondments and internships will be organized in close cooperation with the Sales Representation.

Activity 2.3.2: Skills development and productivity improvement (US$ 1.55 mln)

61. The main objective of this activity will be support workforce development and productivity improvement for the IT sector by financing the following:

i. Skills development. The activity will co-finance training activities linked to industry and market requirements as well as contribute towards assessment of graduates’ readiness for employment. Specifically, this activity will support the establishment of at least two training and certification facilities in IT/knowledge-intensive industry. This program will be implemented in partnership, including co-financing, with top educational institutions in Armenia and private partners such as Microsoft, Intel, Cisco, Oracle, HP, National Instruments, other interested multinational partners, and the Government. In order to ensure that training and other educational programs are targeted to the market needs the project will promote expanded cooperation between GOA, universities, other educational centers and private sector through scholarships, certification subsidies, IT voc-tech trainings as well as initiate short-term programs at universities for quick training and retraining of specialists, and leverage e-education content formation.

ii. Productivity improvement. This activity will support the development of national capacity in international standards, by providing financial assistance for local training and consulting firms to pass the necessary qualification requirements in order provide certification and training in such standards as IT PMP, COBIT and CMMI, as well as to assist firms to acquire such certifications and standards. The program will be particularly aimed at small and medium IT/Knowledge-intensive enterprises.

COMPONENT 3: Project Management (US$ 1.1 mln)

62. This component will finance necessary activities for adequate project management, including monitoring and evaluation, and PR communications campaigns. Specifically, it will support technical assistance, capacity building and incremental operating costs, including travel, as needed for project management, for EKENG, EIF, NCFA, as well as FFPMC. This component will also support the establishment of a regularly updated monitoring and evaluation system
(preferably on a web-based platform) and will finance project audits, as well as any necessary beneficiary audits as per the Project Implementation Plan.
## Annex 5: Project Costs

### Armenia E-Society and Innovation for Competitiveness Project (EIC)

<table>
<thead>
<tr>
<th>Project Cost By Component and/or Activity</th>
<th>Local (US$ million)</th>
<th>Foreign (US$ million)</th>
<th>Total (US$ million)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Component 1. E-Society Infrastructure Development</strong></td>
<td>2.76</td>
<td>11.04</td>
<td>13.8</td>
</tr>
<tr>
<td>1.1 Nationwide Broadband Backbone and Government Network</td>
<td>1.72</td>
<td>6.87</td>
<td>8.59</td>
</tr>
<tr>
<td>1.2 Support to Digital Citizen Program</td>
<td>0.28</td>
<td>1.13</td>
<td>1.41</td>
</tr>
<tr>
<td>1.3 Computer for All Program</td>
<td>0.76</td>
<td>3.04</td>
<td>3.80</td>
</tr>
<tr>
<td><strong>Component 2. Fostering Enterprise Innovation</strong></td>
<td>2.22</td>
<td>8.87</td>
<td>11.09</td>
</tr>
<tr>
<td>2.1 Financial Support for Innovation in Knowledge and Technology-driven Firms</td>
<td>1.02</td>
<td>4.09</td>
<td>5.11</td>
</tr>
<tr>
<td>2.2 Establishment of Gyumri Technology Center</td>
<td>0.63</td>
<td>2.52</td>
<td>3.15</td>
</tr>
<tr>
<td>2.3 Support to IT/Knowledge-intensive Industry Development</td>
<td>0.57</td>
<td>2.26</td>
<td>2.83</td>
</tr>
<tr>
<td><strong>Component 3. Project Management</strong></td>
<td>0.24</td>
<td>0.96</td>
<td>1.20</td>
</tr>
<tr>
<td><strong>Total Baseline Cost</strong></td>
<td>5.22</td>
<td>20.87</td>
<td>26.09</td>
</tr>
<tr>
<td>Physical Contingencies (10%)</td>
<td>0.52</td>
<td>2.09</td>
<td>2.61</td>
</tr>
<tr>
<td>Price Contingencies (5%)</td>
<td>0.26</td>
<td>0.98</td>
<td>1.24</td>
</tr>
<tr>
<td><strong>Total Project Cost (1)</strong></td>
<td>6.00</td>
<td>23.94</td>
<td>29.94</td>
</tr>
<tr>
<td>Interest during construction</td>
<td>0.00</td>
<td>0.00</td>
<td>0.00</td>
</tr>
<tr>
<td>Front-end Fee</td>
<td>0.00</td>
<td>0.06</td>
<td>0.06</td>
</tr>
<tr>
<td><strong>Total Financing Required</strong></td>
<td>6.00</td>
<td>24.00</td>
<td>30.00</td>
</tr>
</tbody>
</table>

(1) Identifiable taxes and duties are US$6m and the total project cost, net of taxes, is US$24. Therefore, the share of project cost net of taxes is 80%.
1. Responsibility for the project lies fully in the Ministry of Economy, which will have the overall project coordination role. High-level management of the project and strategic policy guidance in its implementation will be carried out by a Project Steering Committee (PSC), set up in accordance with the requirements of Government Decree 765 of Dec. 27, 1999 (Credit Governance Board), chaired by the Minister of Economy with right of veto, and with representation of several key participating institutions: Ministry of Economy, the Ministry of Finance, the Ministry of Transport and Communications (MTC), the Public Services Regulatory Commission (PSRC), the Foreign Financed Projects Management Center (FFPMC), the Enterprise Incubator Foundation (EIF), the National Competitiveness Foundation of Armenia (NCFA), the E-Governance Infrastructure Project Implementation Unit OJSC (EKENG).

2. Day-to-day management of specific activities under the project would be assured by the EIF, NCFA and EKENG, alongside FFPMC, which will manage the fiduciary aspects of the project.

3. EIF, NCFA and EKENG will be responsible for the technical aspects of their respective sub-components and activities, i.e. preparing and monitoring implementation plans (work programs and budgets) for their own sub-components and activities, drafting TORs, preparing technical specifications, participating in selection processes, signing contracts and monitoring the performance of consultants/suppliers, collecting project monitoring indicators and handling any other project implementation matters in accordance with the Project Implementation Plan (PIP).

4. FFPMC shall be responsible for the fiduciary aspects of the Project, which will be conducted in a timely manner in accordance with World Bank guidelines: (i) procurement of goods, works and non-consultant services and selection of consultants; (ii) financial management, including maintaining accounts, preparing financial management accounts and getting the accounts audited; and (iii) disbursements, including preparation and submission of withdrawal applications on behalf of EIF, NCFA and EKENG for their respective sub-components and activities. On overall project financial management and procurement issues the FFPMC will report directly to the PSC. FFPMC will also perform the role of Secretary to the PSC.

5. NCFA will be responsible for sub-component 1.1, Nationwide Broadband Backbone Infrastructure and Government Network. NCFA will coordinate the participation of other key government stakeholder agencies, in particular the MTC and the PSRC, among others.

6. EKENG will be responsible for sub-component 1.2, Digital Citizen. EKENG will coordinate the participation of other key government stakeholder agencies including Ministry of Interior, Central Bank of Armenia, and other government agencies.

7. EIF will be responsible for sub-component 1.3, Computer for All Program, as well as the entire component 2, Fostering Enterprise Innovation. EIF will coordinate the participation of other key stakeholders, including Central Bank, Competition Authority, Ministry of Science and Education, among others.

8. Below is the chart that represents the proposed implementation arrangements.
9. **Financial management capacity.** FFPMC successfully implements the Public Sector Modernization (PSMP) project and Social Protection Administration Project (SPAP) as well as several small stand alone grants. There were no weaknesses in the financial management arrangements at FFPMC. FFPMC has adequate Financial Management Manual (FMM) which will be updated prior to project implementation to reflect the activities of the EIC project. However, the fund flow and controls arrangements under various subcomponents of the project will need to be described in the respective operational manuals. FFPMC has adequate Financial Management Manual (FMM) which will be updated prior to the project implementation to reflect the activities of EIC project. The controls over funds flow in relation to (i) activity 1.1.2, Nationwide Broadband Backbone Network, will be described in the Broadband Networks Operational Manual acceptable to the Bank; (ii) activity 1.3.1, Line of Credit for the Computer for All Program, will be described in the Computer for All Operational Manual acceptable to the Bank; (iii) activity 2.1.1, Ideas Generation Grants and Innovation Matching Grants, in the Grants Operational Manual acceptable to the Bank; and (iv) activity 2.1.2, Seed and Early-Stage Venture Fund, in the Seed and Early Stage Venture Fund Operational Manual acceptable to the Bank.
10. **Procurement capacity** The risks associated with procurement and the mitigation measures were identified in the procurement capacity assessment of FFPMC conducted during the pre-appraisal mission of April 2010. The procurement arrangements of FFPMC have been reviewed as part of this capacity assessment and have been found to be satisfactory. However, given that a number of packages with high IT content, PPPs and output based aid (OBA) are expected to be financed under this project, it is recommended to further enhance the capacity of FFPMC procurement staff with specialized training on IT procurement, PPPs and OBA including the use of the Bank’s standard bidding documents for IT procurement.

11. **Technical and managerial capacity**: The capacity of EIF, EKENG and FFPMC were also assessed by the Bank team. All three institutions are well staffed: EIF has 11 professional staff, EKENG also has 11 staff and NCFA has 35 staff, though only two are participating in the project. All three institutions have well established managerial practices and procedures. Staff has relevant qualification for managing current tasks, but the capacity assessment has revealed the need to strengthen that capacity in order to implement the EIC project. The team has discussed and agreed with the three institutions the need to acquire additional resources through selection of consultants under the project, which have already been included in the project budget and procurement plan. In particular, EIF will require a team of about 10 to manage the Computer for All program, and another 8 consultants to manage the other activities under EIF (Venture Fund, brokerage team, sales office, skills development, among others). EKENG will require 5 new specialized staff to manage security, software development and legal aspects of the program. NCFA will require an additional 3-4 staff to manage the broadband component, including project manager and assistant manager, telecommunications expert and legal expert.
1. **Country Issues.** According to the latest Doing Business Survey 2010, Armenia was among the top-rated CIS countries and scored well vis-à-vis many other developed and developing countries (43rd out of 183). At the same time, the latest Transparency International’s Corruption Perception Index 2009, indicating the perceived level of public-sector corruption, ranked Armenia 120 in the list of 180 countries. A Country Procurement Assessment Review (CPAR) done in 2009 also concluded that public procurement environment is in mid to high risk category.

2. The 2005 Country Financial Accountability Assessment (CFAA) report concluded that the overall fiduciary risk in Armenia is significant. The key reasons are: (i) inadequate capacity of core control and supervisory agencies performing the audits within the public sector; and (ii) although most of the basic laws are in place with respect to various entities’ (private sector and public enterprises, including state non-commercial organizations) financial reporting, the compliance remains a problem and authorities need to improve the quality of auditing, monitoring and supervision. The PEFA assessment report published in October 2008 also demonstrates that several critical Public Financial Management (PFM) elements including internal controls, internal and external audit, and financial reporting are still weak.

3. It is planned to use the country Treasury system for the funds flow (including for DAs and counterpart funding) under the project. The use of the country other PFM systems for the project implementation will be considered, as the government progresses with the below PFM reforms.

4. Since the CFAA and the CPAR reports were delivered, some reforms were initiated regarding the PFM. Specifically, following the amendment to the Constitution of the Chamber of Control (COC-Armenian Supreme Audit Institution), it gained more independence from the Parliament, and the new Law on COC, which needs further improvement, to realign it with international standards and best practices, has been adopted. The internal audit reform is under implementation, with the Government strategy in place supported by Internal Audit IDF grants provided to support implementation of the strategy. The MOF also adopted an action plan for implementation of the IPSAS in the Government sector and now is designing a detailed timeline for the transfer to cash basis IPSAS and then to accrual. The reforms in adopting IPSAS in the public sector are also supported by the Bank via separate IDF grants.

5. In spite of the above, the fiduciary risk of the stand-alone financial management arrangements for majority Bank-financed investment projects in Armenia is considered as moderate to low. The government counterpart funding is assessed to be adequate for a number of years including for 2009, despite the impact of the financial and economic crisis on the state budget.

6. Specific procedures are developed by the project to secure proper financial accountability of this project and to minimize project financial management risks. Additional financial management arrangements in the project will include the audit of project and the entity financial

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71 Risk of illegal, irregular or unjustified transactions not being detected, measured on a four point scale according to the CFAA Guidelines (low, moderate, significant or high).
statements by independent auditor acceptable to the Bank, in accordance with term of reference acceptable to the Bank.

7. The country residual risk is assessed to be moderate.

8. **Risk Assessment and Mitigation.** The overall FM risk for the project before mitigation measures is assessed to be significant and after mitigation measures, the risk is moderate. Although the project will be implemented in an environment of high perceived corruption, adequate mitigation measures are in place to ensure that the residual risk is acceptable. The table below summarizes the FM assessment and risk ratings of this project:

<table>
<thead>
<tr>
<th>INHERENT RISKS</th>
<th>FM Risk</th>
<th>Risk Mitigating Measures</th>
<th>Residual Risk</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Country level</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Transparency International’s Corruption Perception Index 2009 identified corruption as an issue. CFAA report addressed overall fiduciary risk as significant. PEFA assessment of critical PFM elements as weak. Weak PFM institutions (additional information is included in country issues in the previous section)</td>
<td>S</td>
<td>• Chamber of control has become independent and is being strengthened. • Internal audit reforms under way. • Public sector accounting standards being improved. • FFPMC is to maintain an independent financial management system, use of private auditors.</td>
<td>M</td>
</tr>
<tr>
<td><strong>Entity level</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Risk of political interference in entity’s management. There could be several entities involved in the project implementation including new Fund to be established.</td>
<td>S</td>
<td>Board composition and structure of FFPMC will provide for independence of the entity. The POM, Broadband Networks Operational Manual, Computer for All Operational Manual, Grants Operational Manual and Seed and Early Stage Venture Fund Operational Manual will clearly describe the interrelations among the implementing entities involved in the project and controls over flow of documents and funds.</td>
<td>M</td>
</tr>
<tr>
<td><strong>Project level</strong></td>
<td></td>
<td></td>
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</tr>
<tr>
<td>Project is small sized, with Treasury used for flow of funds from Bank and Government with risk of inefficiency of the operations on the Treasury (also impacted by the financial crisis) resulting slow funds disbursement.</td>
<td>S</td>
<td>Implementation arrangements that allow close monitoring of Treasury operation under the project, including monitoring the GCF through monthly reports.</td>
<td>M</td>
</tr>
<tr>
<td><strong>OVERALL INHERENT RISK</strong></td>
<td>S</td>
<td></td>
<td>M</td>
</tr>
</tbody>
</table>

**CONTROL RISKS**

<table>
<thead>
<tr>
<th>Budgeting</th>
<th>FM Risk</th>
<th>Risk Mitigating Measures</th>
<th>Residual Risk</th>
</tr>
</thead>
<tbody>
<tr>
<td>Good Budgeting system. Budget is</td>
<td>L</td>
<td>No additional mitigation measure required</td>
<td>L</td>
</tr>
<tr>
<td>Risk Mitigating Measures</td>
<td>Risk</td>
<td>Residual Risk</td>
<td></td>
</tr>
<tr>
<td>-----------------------------------------------------------------------------------------</td>
<td>------</td>
<td>---------------</td>
<td></td>
</tr>
<tr>
<td>prepared in much detail which is necessary for monitoring the project</td>
<td>L</td>
<td>L</td>
<td></td>
</tr>
<tr>
<td><strong>Accounting.</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>The FM staff has extensive experience in the Bank FM and disbursement procedures, including IFRs preparation. The accounting software is adequate.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>The internal control system of the FFPMC is sound. However, there are grant/credit line and Venture Fund (VF) components under the project with operational arrangements to be finalized.</td>
<td>S</td>
<td>M</td>
<td></td>
</tr>
<tr>
<td>Funds Flow. Government and the Bank funds will flow through designated accounts in Treasury.</td>
<td>S</td>
<td>M</td>
<td></td>
</tr>
<tr>
<td>The Funds Flow will be exercised by FFPMC. The funds flow arrangements in relation to (i) activity 1.1.2, Nationwide Broadband Backbone Network, will be described in the Broadband Networks Operational Manual acceptable to the Bank; (ii) activity 1.3.1, Line of Credit for the Computer for All Program, will be described in the Computer for All Operational Manual acceptable to the Bank; (iii) activity 2.1.1, Ideas Generation Grants and Innovation Matching Grants, in the Grants Operational Manual acceptable to the Bank; and (iv) activity 2.1.2, Seed and Early-Stage Venture Fund, in the Seed and Early Stage Venture Fund Operational Manual acceptable to the Bank.</td>
<td>S</td>
<td>M</td>
<td></td>
</tr>
<tr>
<td>Financial Reporting The IFRs of active projects were always received on time and found to be acceptable to the Bank.</td>
<td>L</td>
<td>L</td>
<td></td>
</tr>
<tr>
<td>Auditing No issues have arisen in the audits of the two active Bank-financed projects implemented by FFPMC.</td>
<td>M</td>
<td>M</td>
<td></td>
</tr>
<tr>
<td><strong>OVERALL CONTROL RISK</strong></td>
<td>S</td>
<td>M</td>
<td></td>
</tr>
</tbody>
</table>
9. **Strengths.** The significant strengths that provide a basis for reliance on the project financial management system include: (i) significant experience of FFPMC’s FM staff in implementing Bank-financed projects for past several years; (ii) adequate accounting software utilized, (iii) FM arrangements similar to the active projects implemented by FFPMC and found to be adequate, (iv) no issues arisen in the audits of the active Bank-financed projects (and grants) implemented by FFPMC, and (v) IFRs and audit reports on the active projects (and grants) always received on time and found to be acceptable to the Bank with no major issues observed.

10. **Weaknesses and Action Plan.** There were no weaknesses identified at FFPMC. However, the fund flow and controls arrangements under various subcomponents of the project will need to be described in the respective operational manuals. FFPMC has adequate Financial Management Manual (FMM) which will be updated prior to the project implementation to reflect the activities of EIC project. The controls over funds flow in relation to (i) activity 1.1.2, Nationwide Broadband Backbone Network, will be described in the Broadband Networks Operational Manual acceptable to the Bank; (ii) activity 1.3.1, Line of Credit for the Computer for All Program, will be described in the Computer for All Operational Manual acceptable to the Bank; (iii) activity 2.1.1, Ideas Generation Grants and Innovation Matching Grants, in the Grants Operational Manual acceptable to the Bank; and (iv) activity 2.1.2, Seed and Early-Stage Venture Fund, in the Seed and Early Stage Venture Fund Operational Manual acceptable to the Bank.

11. **Implementing Entity.** Day-to-day management of specific activities under the project would be assured by the Enterprise Incubator Foundation (EIF), the National Competitiveness Foundation of Armenia (NCFA), the E-Governance Infrastructure Project Implementation Unit OJSC (EKENG), alongside Foreign Financing Projects Management Center (FFPMC), which will manage the fiduciary aspects of the project. The residual risk associated with FFPMC is moderate with little likelihood of external intervention to modify the structure and staff of the organization.

12. **Budgeting and Planning.** FFPMC is capable of preparing relevant budgets. Financial Manager prepares the project annual budget in co-operation with procurement specialists. The annual budget is based on the procurement plan, which is regularly updated. The budget is classified by categories, components, and sources of funds. All changes in procurement plan are reviewed by the FFPMC Director agreed in advance with the Bank and with MOF, and only then the changes are incorporated in the annual budget. The risk associated with planning and budgeting is assessed as low.

13. **Accounting Staffing.** The accounting staff at FFPMC consists of an experienced financial manager, an experienced chief accountant and a financial specialist. The financial manager
previously worked at the similar position in another PIU implementing the Bank-financed projects. The financial manager is responsible for budgeting, withdrawal applications preparation, control over statutory accounting and over payments to contractors, and reporting to the WB, MoF and other relevant local authorities. The chief accountant is responsible for statutory accounting and payments to contractors, reporting to the Tax Service and other relevant local authorities. The financial specialist is responsible for bookkeeping and posting of the accounting transactions in the software. The financial manager participated in the regional joint financial management (FM) and Disbursement workshop organized by WB in June 2007 and April 2010 in Yerevan, and in WB Joint Fiduciary Workshop in Tbilisi in November 2009. The risk associated with staffing is assessed as low.

14. **Information Systems.** FFPMC utilizes 1C accounting software. It has fully-integrated accounting and financial management software modules adapted to be used for Bank-financed projects. The software is capable of producing IFRs automatically. For the reconciliation purposes the IFRs are also prepared in the Excel. The risk associated with information systems is assessed as low.

15. **Accounting Policies and Procedures.** The accounting system of FFPMC is maintained according to Accounting Standards of the Republic of Armenia (ASRA). For reporting purposes FFPMC uses cash basis IPSAS. The current chart of accounts will be adapted to the EIC project’s requirements. The risk associated with accounting policies and procedures is considered as low.

16. **Internal Controls and Internal Audit.** The internal controls at the FFPMC are found to be sound. FFPMC maintains separate project FMMs for active projects and grants. All the payments for operating expenses are authorized by the director and then processed by the chief accountant based on the financial manager’s approval. All the payments are made via bank transfers, with no petty cash held. The FFPMC operating expenses budget is prepared by the Financial Manager and is reviewed by the director, MoF and approved by the Project Management Board. All employees have employment contracts. There are also contracts with services providers (internet, phone, etc). The FFPMC financial management system is adequate for processing and maintaining SOE documentation. Stocktaking is performed annually. All fixed assets (FAs) of FFPMC are on the balance sheet of MOF. FFPMC maintains lists of FAs assigned to each employee and FAs registration cards. FFPMC regularly reconciles the projects’ accounting records with the WB disbursement data via the Client Connection system. The formal XDR reconciliation is also conducted on a regular basis (usually at least once a month) in the Excel spreadsheet. The reconciliation between the project accounting records and the DAs is done once a day when there are movements on the accounts. Considering the small size of FFPMC, no internal audit function exists or is required; however the MOF’s internal audit unit performs ad hoc audits. FFPMC will develop/update its Financial Management Manual (FMM) to reflect the activities of EIC project, which will be part of POM. Proper controls need to be established over funds flow in relation to (i) activity 1.1.2, Nationwide Broadband Backbone Network, will be described in the Broadband Networks Operational Manual acceptable to the Bank; (ii) activity 1.3.1, Line of Credit for the Computer for All Program, will be described in the Computer for All Operational Manual acceptable to the Bank; (iii) activity 2.1.1, Ideas Generation Grants and
Innovation Matching Grants, in the Grants Operational Manual acceptable to the Bank; and (iv) activity 2.1.2, Seed and Early-Stage Venture Fund, in the Seed and Early Stage Venture Fund Operational Manual acceptable to the Bank. The risk associated with internal controls and internal audit before mitigation is substantial and after mitigation is considered as moderate.

17. **Financial Reporting.** Project management-oriented Interim Un-audited Financial Reports (IFRs) will be prepared under EIC project. FFPMC will produce a full set of IFRs every three months throughout the life of the project. The format of IFRs has been agreed during the assessment (incorporated into the FMM) which includes: (a) Project Sources and Uses of Funds, (b) Uses of Funds by Project Activity, (c) Project Balance Sheet, (d) Designated Account Statements, and (e) SOE Withdrawal Schedule. These financial reports will be submitted to Bank within 45 days of the end of each calendar quarter. The first quarterly IFRs will be submitted after the end of the first full calendar quarter following the initial disbursement. The risk associated with reporting and monitoring is assessed as low.

18. **External Audit.** No issues have arisen in the audits of previous and current Bank-financed projects implemented by FFPMC. The audit of EIC project and Venture Fund (VF) to be established under the project will be conducted (i) by independent private auditors acceptable to the Bank, on terms of reference (TOR) acceptable to the Bank and procured by FFPMC, and (ii) according to the International Standards on Auditing (ISA) issued by the International Auditing and Assurance Standards Board of the International Federation of Accountants (IFAC). The MOE has agreed that it will publish (posting on its website) the audit reports for the project and the entity within two weeks of receipt of the report from the auditors. Following the Bank's formal receipt of these reports from the Borrower, the Bank will make them available to the public in accordance with the World Bank Policy on Access to Information.

19. The FFPMC’s current auditing arrangements are acceptable to the Bank, and it has been agreed that similar audit arrangements will be adopted for EIC project’s and the entity’s financial statements audit.

20. The sample TOR acceptable to the Bank and to be used for the project and entity audit was provided to FFPMC. If the period from the date of effectiveness of the loan to the end of the borrower’s fiscal year is no more than six months, the first audit report for the project may cover financial statements for the period from effectiveness to the end of the second fiscal year. The contract for the audit may be extended from year-to-year with the same auditor, subject to satisfactory performance. The cost of the project audit will be financed from the proceeds of the loan, while the cost of VF audit will be covered by VF. The following table identifies the audit reports that will be required to be submitted by the project implementation agency together with the due date for submission.

<table>
<thead>
<tr>
<th>Audit Report</th>
<th>Due Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>Continuing Entity financial statements— Venture Fund</td>
<td>Within six months of the end of each fiscal year/reporting period after the first deposit into the Venture Fund is made, and also for the reporting period when the project was closed</td>
</tr>
<tr>
<td>The financial statements include (i) Statement of Financial Position, (ii) Statement of Comprehensive Income, (iii) Statement of Changes in Equity, (iv) Statement of Cash Flows, and (v) notes, comprising a</td>
<td></td>
</tr>
</tbody>
</table>

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summary of significant accounting policies and other explanatory information.

Project financial statements (PFS).
The PFS include (i) Project Balance Sheet, (ii) Sources and Uses of Funds, (iii) Uses of Funds by Project Activity, (iv) SOE Withdrawal Schedule, (v) Designated Account Statement, (vi) Notes to the financial statements, and (vii) Reconciliation Statement.

Within six months of the end of each fiscal year and also at the closing of the project

21. A technical or performance audit will be conducted by an independent third party verification agent and on the TOR acceptable to the Bank prior to the disbursement of the funds to the private operators under Subcomponent 1.1.2.

22. In addition, the Armenian Chamber of Control, the country’s supreme audit institution, performs ad hoc external audits of the FFPoMC and projects under its implementation with findings usually shared and discussed with the Bank. The risk associated with external audit is considered moderate.

Funds Flow and Disbursement Arrangements

23. Withdrawal schedule. The table below shows the total project funding by disbursement category.

<table>
<thead>
<tr>
<th>Description</th>
<th>Amount of the Loan Allocated (expressed in USD)</th>
<th>Percentage of Expenditures to be financed (exclusive of taxes)</th>
</tr>
</thead>
<tbody>
<tr>
<td>(1) Goods, works, consultants’ services, Training and Incremental Operating Costs for the Project</td>
<td>5,940,000</td>
<td>100%</td>
</tr>
<tr>
<td>(2) Sub-financing:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>(a) under the Part A.1(b) of the Project (Nationwide Broadband Backbone and Government Network)</td>
<td>7,500,000</td>
<td>100%</td>
</tr>
<tr>
<td>(b) under the Part A.3 of the Project (Computer for All Program)</td>
<td>3,000,000</td>
<td>100%</td>
</tr>
<tr>
<td>(c) under the Part B.1 (a) of the Project (Ideas Generation Grants and Innovation Matching Grants)</td>
<td>900,000</td>
<td>100%</td>
</tr>
<tr>
<td>(d) for Sub-projects under Part B.1 (b) of the Project (Seed and Early Stage Venture Fund)</td>
<td>3,000,000</td>
<td>50%</td>
</tr>
<tr>
<td>(3) Consultants’ services and</td>
<td>600,000</td>
<td>100%</td>
</tr>
</tbody>
</table>
24. **Retroactive financing.** Retroactive financing will be provided under the project for payments made prior to the date of this Agreement, except that withdrawals up to an aggregate amount not to exceed $1,228,000 equivalent may be made for payments made prior to this date but on or after September 2, 2010 (but in no case more than one year prior to the date of this Agreement) for Eligible Expenditures under the Category (1) in the table, provided that the pertinent obligations and/or conditions set forth in this Agreement, in respect of the relevant Eligible Expenditure, have been complied with or met. The services, civil works, and goods to be eligible for retroactive financing should be contracted following World Bank’s "Guidelines: Procurement under IBRD Loans and IDA Credits" dated May 2004, revised October 2006; and "Guidelines: Selection and Employment of Consultants by World Bank Borrowers" dated May 2004, revised October 2006, and the provisions stipulated in the Legal Agreements. All procurement contracts proposed under retroactive financing will be subject to the Bank’s prior review.

25. **Designated Account.** To ensure that funds are readily available for project implementation, the Foreign Financed Projects Management Center (FFPMC) at the Ministry of Finance would open, maintain and operate two Designated Accounts (DA) at the Treasury: (i) Designated Account A for payments made under disbursement categories 1, 2 (c) and 3, and (ii) Designated Account B for payments made under disbursement category 2 (d) (Venture Fund). Deposits into and payments from the DAs will be made in accordance with the provisions stated in the loan agreement. Disbursements under this loan will be transaction-based and include withdrawal applications for advances, direct payments, reimbursements and special commitments. Withdrawal applications will be prepared by the FFPMP and signed by authorized signatories, as designated by the representative of the borrower. The name of each of the authorized signatories and their corresponding specimen of signature will be submitted to the Bank before the first disbursement is claimed.

26. The authorized ceiling of the DAs would be US$1,800,000 for categories 1, 2 (c) and 3 and $1,000,000 for category 2 (d) (Venture Fund). Authorized Advances (as said term is defined in Section IV.A.2 of Schedule 2 to the Loan Agreement) to the Second Designated Account will be limited to US$ 1,000,000 and subsequent replenishments will follow the procedures stipulated in said Section.

27. The amount to be claimed and advanced under the first application would be determined based on initial project needs. The FFPMP would claim the remainder of the advance when the
project has reached an advanced stage of implementation. The Designated Account A would be replenished monthly based on withdrawal applications supported by appropriate documentation, or when half of the advance to the DA has been utilized, whichever occurs first. The Designated Account A will be audited annually by external auditors acceptable to IBRD as part of the overall project audit. Advances and replenishments to Designated Account B will be made in accordance with specific provisions stated in the disbursement letter and legal agreement.

28. **Statement of Expenditures.** All applications for withdrawal of proceeds from the grant account will be fully documented, except for expenditures under contracts with an estimated value of: (a) US$2,000,000 or less for works; (b) US$300,000 or less for goods; (c) US$100,000 or less for consulting firms, and (d) US$50,000 or less for individual consultants, as well as all training and workshops, which will be claimed on the basis of Statement of Expenditures (SOEs). The documentation supporting expenditures will be retained at the FFPMC and will be readily accessible for review by the external auditor and periodic Bank supervision missions. All disbursements will be subject to the conditions of the Loan Agreement and disbursement procedures defined in the Disbursement Letter.

29. The funds flow arrangements in relation to (i) activity 1.1.2, Nationwide Broadband Backbone Network, will be described in the Broadband Networks Operational Manual acceptable to the Bank; (ii) activity 1.3.1, Line of Credit for the Computer for All Program, will be described in the Computer for All Operational Manual acceptable to the Bank; (iii) activity 2.1.1, Ideas Generation Grants and Innovation Matching Grants, in the Grants Operational Manual acceptable to the Bank; and (iv) activity 2.1.2, Seed and Early-Stage Venture Fund, in the Seed and Early Stage Venture Fund Operational Manual acceptable to the Bank, and regularly monitored by FFPMC.

30. The Bank may, upon the Borrower’s request, and presentation to the Bank of evidence acceptable to the Bank showing that: (i) the Venture Fund has been created as provided in Part B.1 (b) of the Project; (ii) a financial management assessment of the Venture Fund has been carried out in a manner acceptable to the Bank; and (iii) the manager for the Venture Fund has been selected in a manner acceptable to the Bank, deposit into the Second Designated Account, an advance of the proceeds of the Loan up to an amount not to exceed $1,000,000 (the Authorized Advance) to finance Eligible Expenditures under Category (2) (d).

31. The risk associated with funds flow and disbursement after mitigation is considered as moderate.

32. **Implementation Support and Supervision Plan.** As part of its project implementation support and supervision missions, the Bank will arrange risk-based FM missions within a year since the project effectiveness, and then at appropriate intervals. During project implementation, the Bank will review the project’s FM arrangements in the following ways: (a) review the project’s quarterly IFRs as well as the project’s and the entity’s annual audited financial statements and auditor’s management letter and remedial actions recommended in the auditor’s management letters; and (b) during the Bank’s on-site implementation support and supervision missions, review the following key areas (i) project accounting and internal control systems; (ii) budgeting and financial planning arrangements; (iii) disbursement management and financial flows, including counterpart funds, as applicable; and (iv) any incidences of corrupt practices involving project resources. An FM assessment of the Venture Fund will be carried out upon
establishment of the fund (refer to the Funds Flow and Disbursement Arrangements section). As required, a Bank-accredited Financial Management Specialist will be involved in the supervision process.
Annex 8: Procurement Arrangements
Armenia E-Society and Innovation for Competitiveness Project (EIC)

A. General

Procurement for the E-Society and Innovation for Competitiveness Project will be carried out in accordance with the World Bank’s "Guidelines: Procurement under IBRD Loans and IDA Credits" published May 2004 and revised in October 2006 and May 2010 (Procurement Guidelines); and "Guidelines: Selection and Employment of Consultants by World Bank Borrowers" published May 2004 and revised in October 2006 and May 2010 (Consultant Guidelines) and the provisions stipulated in the Loan Agreement (LA). The various procurement actions under different expenditure categories are described in general below. For each contract to be financed under the LA, the various procurement or consultant selection methods, the need for pre-qualification, estimated costs, prior review requirements, and time frame have been agreed between the Borrower and the Bank in the Procurement Plan (PP). The PP will be updated at least annually or as required to reflect the actual project implementation needs and improvements in institutional capacity. A General Procurement Notice (GPN) was published on October 15, 2010 in UNDB on-line and in its printed version as well as in dgMarket online. Specific Procurement Notices (SPN) will be published for all ICB procurement and Consulting contracts as per Guidelines as the corresponding bidding documents and RFPs become ready and available.

B. Assessment of the Agency’s capacity to implement procurement

A Country Procurement Assessment Report (CPAR) for the Republic of Armenia was completed in June 2009. The Armenian Public Procurement Law (PPL) is generally comparable with internationally accepted public procurement legislation. However, there are certain gaps in the legal and regulatory framework and institutional capacity for procurement that remain to be addressed. The current CPAR concludes that Armenia should be rated as mid to high risk country.

An assessment of the capacity of the Foreign Financing Projects Management Center (FFPMC) to undertake project procurement was conducted by the Bank during pre-appraisal and is included in the project files. Procurement activities will be carried out by FFPMC in close coordination with MoE, EKNEG, EIF and NCFA. FFPMC has served as the Government’s project as a fiduciary agent for almost 40 World Bank Projects and therefore have extensive experience in managing World Bank Projects in accordance with World Bank and other donors’ procurement guidelines. The strengths that provide the basis of reliance on the project procurement management system include: (i) Project procurement independence through the establishment of a dedicated Fiduciary Unit (FFPMC) with suitable staffing structure; (ii) already gained significant experience with the World Bank procurement policies and procedures; and (iii) general perception that Bank-financed projects are fair in their handling of procurement. However, there is some concern over how efficiently it will be possible to coordinate implementation activities of the technical/working groups created, namely EKENG, EIF and NCFA. According to local legislation, each project should have a Project Management Board chaired by the relevant line Minister. Among the activities delegated to the Board is approval of
the bidding documents and award decisions when the contract amount exceeds US$50,000 equivalent. Under the project, it is anticipated that the MoE will chair the Board. Since FFPMC is not under the administrative control of the MoE, it will be important to clearly define responsibilities and accountabilities for all parties involved in the project implementation. The responsibilities should be mentioned in the Project Implementation Plan (PIP) along with detailed description of procurement methods and procedures to be adopted under the Project. Given the innovative and complexity of the project, which includes high IT content packages, PPPs and OBA approach it is recommended to further enhance the capacity of the FFPMC procurement specialist assigned to this project with specialized training on IT procurement. Procurement risk is rated as substantial after the proposed mitigation measures highlighted in para C below.

C. Procurement risk assessment

The overall procurement risk is rated substantial. The risks associated with procurement and the mitigation measures were identified in the procurement capacity assessment of FFPMC conducted during the pre-appraisal mission of April 2010 and are summarized in the table below.

Table 1: Summary Risk Assessment and Proposed Action Plan

<table>
<thead>
<tr>
<th>Proposed Action Plan</th>
<th>Perceived Risk</th>
<th>Mitigation Measures</th>
<th>Timeframe</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Ratings of Risk</td>
<td>Ratings of Residual Risk</td>
<td></td>
</tr>
<tr>
<td>As per the current CPAR dated June 2009, Armenia is rated as Mid to High risk country.</td>
<td>S</td>
<td>The Team will enforce strict compliance with the World Bank’s Procurement and Consultants Guidelines, Anti-Corruption Guidelines and procurement arrangements for the project as specified in the OM; Grants/Fund Manuals and in the Procurement Plan.</td>
<td>M</td>
</tr>
<tr>
<td>Scope is complex and preparation of Broadband and Certification Authority Bidding Documents/ Evaluation of bids and contract negotiations may become a challenge.</td>
<td>H</td>
<td>Consultant with experience and knowledge in (i) broadband with output based aid approach and (ii) preparation of Certification Authority technical specifications should assist IAs in preparing of bidding document; evaluating the bids and contract</td>
<td>S</td>
</tr>
</tbody>
</table>
negotiations.
evaluating the bids and contract negotiations.

Complexity of the various sub-financing schemes foreseen under the project, including Computer for all, grants, and venture fund | H | Operational Manual to clearly detail the selection process and reporting arrangements acceptable to the Bank. Bank to review the first three contracts under each scheme. | S | During project implementation.

Limited experience within FFPMC in preparation of Broadband/IT bidding packages. | H | FFPMC PS to attend training in procurement of IT systems. | S | Project Launch; ILO training and during Supervision missions.

Local legislation requires each project should have a Project Management Board chaired by the relevant line Minister (Minister of Economy will chair the Board) | H | FFPMC is not under the administrative control of the MoE, it will be important to define responsibilities and accountabilities of all parties involved in project implementation. | S | Responsibilities and accountabilities to be clearly stated in the Operational Manual by Negotiation.

H: High; S: Substantial; M: Moderate and L: Low

D. Procurement implementation and arrangements

Procurement activities will be carried out by FFPMC in close coordination with MoE, EKENG, EIF and NCFA.

Procurement of Works: Civil works under the project will include refurbishment of (i) the Gyumri Technology Center which may involve refurbishment of an existing government-owned building (component 2.2.1) and (ii) renovation of Training and Certification Facilities (component 2.3.2).

Procurement of Goods: Goods contracts to be procured under this project will include broadband backbone network; equipment for the Certification Authority; office furniture, ICT equipments and LAN for Gyumri Technology Center; and equipment for Training and Certification Facilities.

The following methods of procurement will be followed:

International Competitive Bidding (ICB): Goods estimated to cost US$300,000 and more equivalent per contract will be procured using ICB procedures in accordance with the Bank’s Procurement Guidelines. Limited International Bidding (LIB) is not envisaged at this stage. If
the need arises during implementation and justified, Bidders shall be invited in accordance with the provisions of paragraph 3.2 of the Guidelines. The procurement will be done using the Bank’s SBD for all ICB and National SBD agreed with and satisfactory to the Bank. For Certification Authority the Bank’s SBD for Supply and Installation of Information Systems (single stage) may be adopted and adjusted to the PPP modality agreed with the borrower. Nationwide Broadband Backbone and Government Network bidding will be conducted according to the provisions of paragraph 3.13a, 3.14, and 3.15 of the Guidelines. Since the Bank has no standard bidding documents for this type of procurement, the bidding documents will be prepared by the borrower in consultation with the Bank and must be satisfactory to the Bank.

**National Competitive Bidding (NCB):** Works estimated to cost less than US$2,000,000 equivalent per contract and Goods estimated to cost less than US$300,000 equivalent per contract will be procured according to NCB procedures in accordance with paragraphs 3.3 and 3.4 of the Bank’s Procurement Guidelines. The updated Europe and Central Asia sample documents on the National Competitive Bidding (NCB) will be used.

**Shopping (SH):** This procedure will be used for simple, readily available off-the-shelf Goods, including hardware and software, furniture, office and computer equipments, etc. All items would have standard specifications, estimated to cost less than US$100,000 equivalent per contract. As for the small/minor Works, some packages of the required refurbishment will be procured under Shopping procedures as they are estimated to cost less than US$100,000 equivalent per contract. This procedure will be based on obtaining and comparing price quotations from at least three suppliers in case of goods or contractors in case of civil works in accordance with paragraph 3.5 of the Procurement Guidelines. The evaluation of quotations shall follow the same principles as of competitive bidding.

**Direct Contracting:** When certain goods are available only from a particular supplier or in cases where compatibility with existing equipment so requires, these goods may be procured following the Direct Contracting method with prior approval from the Bank and in accordance with paragraph 3.6 of the Procurement Guidelines.

**Sub-loans to Financial Intermediaries:** Procurement of goods and services under subprojects financed through Sub-loans to (i) commercial banks for the support of the computer for all program under sub-component 1.3; and (ii) seed and early stage venture fund will be carried out in accordance with paragraph 3.12 of the guidelines on Commercial Practices in accordance with established private sector practices which are acceptable to the Bank, as further defined in the respective Operational Manual. No works will be financed under such loans. It should be ensured that there is no conflict of interest and procedures will be detailed out in the respective Fund operational manuals respectively. The total aggregate amount for Financial Intermediary Loans is US$ 6 million.

**Grants for subprojects:** Subprojects addressed to individuals, public, private or public-private beneficiaries would be financed through competitive grants under sub-component 2.2 of the project for (i) ideas grants and innovation matching grants; and (ii) GTC Technology extension grants. Procurement of goods and services would be carried out in accordance with paragraph 3.12 of the guidelines on Commercial Practices and in accordance with procedures detailed in the Grants Operational Manual. No works will be financed under such grants. Grantees will
decide what investments to make in accordance with the competitively selected proposal. The grant application will contain a business plan including a list of the goods and services to be procured and their estimated cost. Grants under the program would be publicly announced and awarded through open competitions. The total aggregate amount for grants is US$ 0.7 million.

**Selection of Consultants:** Consultants’ services contracts to be procured under this project will include technical assistance for the legal and regulatory framework on PPPs; support to backbone implementation; TA for certification authority; assessment of the policy environment for innovation and knowledge-intensive sectors; policy design and implementation; improvements to legal framework for competition protection and capacity building for competition authority; technical assistance to the incubation management; business development services, project audit, etc. Contracts with consulting firms will be awarded following the procedure of quality and cost based selection (QCBS); procedure of quality based selection (QBS) would be followed for assignments which meet the requirements of paragraph 3.2 of the consultants guidelines; procedure of fixed budget (FBS) would be followed for assignments which meet the requirements of paragraph 3.5 of the consultants guidelines; and procedure of single source selection (SSS) would be followed for assignments which meet the requirements of paragraph 3.10-3.12 of the consultant guidelines and will always require the Bank’s prior review regardless of the amount. Consulting services estimated to cost less than $200,000 equivalent per contract under this project will be procured following the procedures of selection based on consultant’s qualifications (CQS). Procedures of selection of individual consultants (IC) would be followed for assignments which meet the requirements of paragraph 5.1 and 5.3 of the Consultant Guidelines. Under the circumstances described in paragraph 5.4 of the Consultant Guidelines, such contracts may be awarded to individual consultants on a sole-source basis. Least cost selection (LCS) would be used for assignments for selecting the auditors for auditing the project accounts. For all contracts to be awarded following QCBS, QBS, LCS, and FBS, the Bank standard request for proposal will be used. Short lists of consultants for services estimated to cost less than $100,000 equivalent per contract may be composed entirely of national consultants in accordance with the provisions of paragraph 2.7 of the Consultant Guidelines.

**Selection of consultants through Commercial Practices:** In few instances, selection of consultants under subprojects financed through Sub-loans for the seed and early stage venture fund under sub-component 2.2 will be carried out in accordance with paragraph 3.14 of the guidelines. In these cases, the Sub-Borrower may follow well-established private sector or commercial practices, acceptable to the Bank, as detailed in the Fund Operational Manual. The total aggregate amount for Selection of consultants through Commercial Practices is estimated at US$1 million.

**Training Activities:** Training is an integral element of the project’s capacity building. The project will finance training programs which will include workshops, beneficiaries training, study tours, local and regional training. Such training programs, particularly study tours would be included in larger TA contracts with firms to reduce administrative burden on the FFPMC. Training should be identified and expenditures relating to such training should be described in the OM. Estimated budget, list of participants and draft agenda for training event will be subject to the World Bank’s prior review. Expenditure items for training activities, including study tours would be reported under SOEs. The status of the training plans would be included as part of the quarterly progress reports. Training under the project is envisaged for component 2.3.1,
Capacity Building Training of Trainers; institutional capacity building for innovation; training/Internship for GTC; industry promotion tours and training for FFPMC staff. An Annual Training Plan and Annual Operating Costs Plan will be prepared and submitted to the Bank at the beginning of each year for review and approval. After the Bank's approval of these plans; activities can be implemented in line with the plans without seeking the Bank's clearance for each activity.

**Project Implementation Plan (PIP):** The overall project procurement procedures, thresholds, SBDs, RFPs, evaluation reports, contracts to be used for each procurement method, as well as model contracts for works and goods procured, will be presented in the POM.

**Operating Costs:** are set aside for (i) Computer for all program; (ii) Innovation; (iii) GTC; and (iv) NCFA, EKENG, EIF FFPMC. “Operating Costs” means expenditures incurred on account of Project implementation by the FFPMC, EIF, EKENG and NCFA such as office supplies, minor office equipment, vehicle rental, operation and maintenance, costs for fuel, equipment and software maintenance, literature, and FFPMC, EIF, EKENG and NCFA staff salaries (excluding Government officials’ salaries) training, field trips, meetings, lodging, per diem and travel costs related to the Project, communication costs, utilities, mass media and printing services, reasonable banking charges and advertisement costs, and other expenses that may be agreed with the Bank during the Project implementation; and (b) “Training” means expenses incurred by the FFPMC, the EIF, EKENG and the NCFA in connection with carrying out training activities under the Project, including travel costs and per diem for local trainees and trainers, study tours and workshops, rental of facilities and equipment and training materials and related supplies.

**Project Preparation Advance:** In order to jump start the priority activities, the Borrower has requested and obtained a project preparation advance (PPA) of US$ 3 million which will cover eleven consultancy services for components 1 and 2 and two goods contracts for component 1. All procurement actions under the PPA shall be reviewed by the Bank.

**Any Other Special Procurement/Selection Arrangements:** A sole source selection is envisaged for the (i) Broadband Coordinator, (ii) Project Manager for Computer for All, and (iii) Design coordinator for Gyumri. These candidates were hired competitively under the PHRD grant and meet the provisions of para 5.4 of Bank’s guidelines.

**Filing and records keeping:** It was agreed that FFPMC will maintain complete records under the proposed project for each activities, which will include complete procurement documentation for each contracts, including bidding documents, RFPs, advertisements, bids received, bid evaluations, no objections, letters of acceptance, contract agreements, bid security, advance payment guarantee, performance security, photocopies of invoices and payments and related correspondence etc. Contract award information will be promptly recorded and contract rosters maintained. Agreed reporting format are included in the operation manual.

**Procurement Plan**

The Procurement Plan which provides the basis for the procurement methods and time frame of the implementation for key contracts for works, goods and consultants’ services expected under the Project are being prepared. Procurement under the project will be carried out in accordance
with the procurement plan. No procurement, regardless of the value, will be done unless it has been approved under the procurement plan by the Bank. Any change in the estimated cost of any contract will promptly be conveyed to the Bank for its approval. The Procurement Plan will be closely monitored and updated in agreement with the Project Team annually or as required to reflect the actual project implementation needs and improvements in institutional capacity. This plan has been agreed between the GoA and the Project Team on October 7, 2010, and is available on the Bank’s external website. It will also be available in the project’s database and on the Bank’s external website.

**Frequency of Procurement Supervision**

In addition to the prior review supervision to be carried out by the Bank team, the capacity assessment of the FFPMC recommends post reviews to be carried on at least one in five (20% percent) of the contracts subject to post review during the review period. It is expected that a supervision mission in the field will be conducted every six months during which post reviews will be conducted.

**Additional Provisions for National Competitive Bidding**

In order to ensure economy, efficiency, transparency and broad consistency with the provisions of Section I of the Guidelines, the criteria specified in the capacity assessment and the FA shall be followed in procurement under National Competitive Bidding procedures. Such clarifications as described in the CPAR are required for compliance with the provisions of the Procurement Guidelines and shall be included in the FA.

**Anti Corruption Measures**: Procurement capacity assessment included certain recommendations on strengthening procurement including on the anti-corruption aspects of project implementation. These included such measures as review of Anti-Corruption guidelines, signing of “Declaration of Impartiality” letters by Evaluation Committee members, etc.
### Initial Procurement Plan Dated October 7, 2010

#### a) Works and Goods

<table>
<thead>
<tr>
<th>Package No.</th>
<th>Description/ Location</th>
<th>No. of Packages</th>
<th>Procurement Method</th>
<th>Review By Bank (PRIOR / Post)</th>
<th>Invitation Date</th>
<th>Expected Bid-Opening Date</th>
<th>Contract Award Date</th>
<th>Start Date</th>
<th>Completion Date</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>A</td>
<td>C</td>
<td>D</td>
<td>E</td>
<td>F</td>
<td>G</td>
<td>H</td>
<td>I</td>
</tr>
<tr>
<td>1. WORKS</td>
<td></td>
<td></td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2.2.1-W-1</td>
<td>GTC Refurbishment</td>
<td>1</td>
<td>NCB</td>
<td>Prior</td>
<td>12-Jan-11</td>
<td>23-Feb-11</td>
<td>24-Mar-11</td>
<td>07-Apr-11</td>
<td>06-Jul-11</td>
</tr>
</tbody>
</table>

**2. GOODS**

<table>
<thead>
<tr>
<th>Package No.</th>
<th>Description/ Location</th>
<th>No. of Packages</th>
<th>Procurement Method</th>
<th>Review By Bank (PRIOR / Post)</th>
<th>Invitation Date</th>
<th>Expected Bid-Opening Date</th>
<th>Contract Award Date</th>
<th>Start Date</th>
<th>Completion Date</th>
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<tr>
<td>1.1.2-G-1</td>
<td>Broadband PPP</td>
<td>1</td>
<td>ICB</td>
<td>Prior</td>
<td>23-May-11</td>
<td>04-Jul-11</td>
<td>02-Aug-11</td>
<td>16-Aug-11</td>
<td>12-Feb-12</td>
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<tr>
<td>1.2.2-G-1</td>
<td>Hardware/software development/customization/training for Certification Authority (CA)</td>
<td>1</td>
<td>ICB</td>
<td>Prior</td>
<td>22-Nov-10</td>
<td>03-Jan-11</td>
<td>01-Feb-11</td>
<td>15-Feb-11</td>
<td>14-Aug-11</td>
</tr>
<tr>
<td>2.2.1-G-1</td>
<td>Equipment and LAN for GTC</td>
<td>1</td>
<td>ICB</td>
<td>Prior</td>
<td>08-Oct-11</td>
<td>19-Nov-11</td>
<td>18-Dec-11</td>
<td>01-Jan-12</td>
<td>31-Mar-12</td>
</tr>
</tbody>
</table>

**Legend:**

- **ICB =** International Competitive Bidding (in accordance with section 2 of the Guidelines)
  
  - For works contracts valued at or more than ≥ US$2,000,000
  
  - For goods contracts valued at or more than ≥ US$300,000

- **NCB =** National Competitive Bidding (in accordance with section 3.3 of the Guidelines)
  
  - For works contracts valued less than ≤ US$2,000,000
  
  - For goods contracts valued less than ≤ US$300,000

- **LIB =** Limited International Bidding (in accordance with section 3.2 of the Guidelines)

- **DC =** Direct Contracting (in accordance with section 3.6 of the Guidelines)

- **SH =** Shopping (in accordance with section 3.5 of the Guidelines)
  
  - For works and goods contracts valued at or less than ≤ US$100,000. The aggregate amount of goods to be procured through the shopping method is estimated at $500,000.

- **FI =** Loans to Financial Intermediaries. Commercial Practice threshold up to $2million for goods and works.

- **BOO/BOT/BOOT =** BOO/BOT/BOOT, Concessions and Similar Private Sector Arrangements

**Prior review:**

- For Works contracts: All ICB contracts. All NCB contracts of USD1,000,000 equivalent or more including the first two contracts regardless of value of contract.

- For Goods contracts: All ICB contracts. All NCB contracts of USD 200,000 equivalent or more including the first two contracts regardless of value of contract.

- Direct Contracting: All
### b) Consultants’ Services

<table>
<thead>
<tr>
<th>Package No.</th>
<th>Description of Assignment/ Location</th>
<th>Selection Method</th>
<th>Review by Bank Prior / Post</th>
<th>Advertisement for EOI Date</th>
<th>Expected Proposal Submission Date</th>
<th>Contract Award Date</th>
<th>Start Date</th>
<th>Completion Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>B</td>
<td>D</td>
<td>E</td>
<td>F</td>
<td>G</td>
<td>H</td>
<td>I</td>
<td>J</td>
</tr>
</tbody>
</table>

#### 3. CONSULTANTS’ SERVICES

1.1.1-C-1 TA and capacity building on Convergence for PSRC  
QCBS  
Prior  
6-Oct-11  
29-Nov-11  
22-Jan-12  
10-Feb-12  
31-Oct-12

1.2.1-C-1 Technical assistance for testing and verification of eID and the Certification Authority systems  
QCBS  
Prior  
17-Feb-11  
12-Apr-11  
05-Jun-11  
24-Jun-11  
14-Mar-12

2.1.2-C-2 Seed and Early-stage Venture Fund Management  
QCBS  
Prior  
05-Jan-11  
28-Feb-11  
23-Apr-11  
12-May-11  
20-May-12

2.1.2-C-3 Industry promotion (US Rep Office)  
QCBS  
Prior  
01-Dec-10  
24-Jan-11  
19-Mar-11  
07-Apr-11  
15-Apr-12

2.1.2-C-3 Capacity Building Training of Trainers  
QCBS  
Prior  
3-Mar-11  
26-Apr-11  
19-Jun-11  
08-Jul-11  
16-Jul-12

2.3.2-C-1 Industry Certification/Productivity Improvement  
QCBS  
Prior  
10-Apr-11  
3-Jun-11  
27-Jul-11  
15-Aug-11  
23-Aug-12

2.3.2-C-2 Entrepreneurship Training Firm  
QCBS  
Prior  
03-Mar-11  
26-Apr-11  
19-Jun-11  
08-Jul-11  
16-Jul-12

3.1.1-C-2 Monitoring and Evaluation  
QCBS  
Prior  
31-Aug-11  
24-Oct-11  
17-Dec-11  
05-Jan-12  
18-Apr-12

3.1.1-C-2 Project Audit  
LCS  
Prior  
09-Aug-11  
30-Sep-11  
23-Nov-11  
12-Dec-11  
20-Dec-12

1.1.1-C-2 Broadband local coordinator  
SSS  
Prior  
11-Nov-10  
18-Nov-10  
28-Nov-10

2.2.1-C-2 Design Supervisor  
SSS  
Prior  
04-Apr-11  
11-Apr-11  
21-Apr-11

#### Legend

- **QCBS** = Quality and Cost-based Selection (in accordance with sections 2.1 - 2.28 of the Consultant’s Guidelines)
- **QBS** = Quality Based Selection (in accordance with section 3.2 the Consultant’s Guidelines)
- **FBS** = Fixed Budget Selection (in accordance with section 3.5 the Consultant’s Guidelines)
- **CQ** = Consultants Qualifications (in accordance with section 3.7-8 of the Consultant’s Guidelines)
- **LCS** = Least-Cost Selection (in accordance with section 3.6 of the Consultant’s Guidelines)
- **SSS** = Single source Selection (in accordance with section 3.9-13 of the Consultant’s Guidelines)
- **CP** = Commercial Practices (in accordance with section 3.14 the Consultant’s Guidelines)
- **IC** = Individual Consultant (in accordance with section V of the Consultant’s Guidelines)

#### Prior Review

For firms: All contracts equal to USD 100,000 or more.  All CQ contracts more than USD 100,000 and all SSS contracts.

For individual consultants: All contracts equal to USD 50,000 equivalent or more.  All SSS contracts and all TORs,
Annex 9: Economic and Financial Analysis
Armenia E-Society and Innovation for Competitiveness Project (EIC)

1. Under the PHRD grant a detailed study was financed to finalize the design of the Monitoring and Evaluation System and conduct an economic and social impact assessment of the project. The study was conducted by the Armenian economic analysis firm Economy and Values Research Center (EV Research Center). The results of the impact analysis are contained in this annex as a summary of the detailed analysis contained in the Report on Monitoring and Evaluation System and Impact Assessment Framework.

2. The E-Society Infrastructure Development component of the project is expected to have the following positive economic and social impacts:

<table>
<thead>
<tr>
<th>Short term</th>
<th>Long term</th>
</tr>
</thead>
<tbody>
<tr>
<td>Increase of ISP sector revenues</td>
<td>Emergence of new jobs enabled by the use of ICT tools, computers, internet services and upgraded human capital</td>
</tr>
<tr>
<td>Private investment in the regional broadband backbone and digital-infrastructure of the country</td>
<td>Emergence of business providing ICT enabled services</td>
</tr>
<tr>
<td>Increased rate of co-ordination of the public institutions by the Government through centralized electronic framework</td>
<td>Optimization of Government expenditure on communication expenses</td>
</tr>
<tr>
<td>Jobs created in the construction and maintenance process of the nationwide broadband backbone and in local ISPs</td>
<td>Greater e-participation in the society</td>
</tr>
<tr>
<td>Improved chance of regional integration with other communities and nationwide programs</td>
<td>Tax revenues due to long-term positive externalities of the regional broadband network and e-transactions</td>
</tr>
<tr>
<td>Building successful case of PPP</td>
<td>Better public governance</td>
</tr>
<tr>
<td>Tax revenues generated from increased sales of the internet services and computers</td>
<td>Increased exports ICT enabled goods and services</td>
</tr>
<tr>
<td></td>
<td>Better educational opportunities/E-learning</td>
</tr>
<tr>
<td></td>
<td>Greater opportunities for social exchange</td>
</tr>
<tr>
<td></td>
<td>Increased access to information</td>
</tr>
<tr>
<td></td>
<td>Reduction in environmental pollution</td>
</tr>
</tbody>
</table>

Note: H=High, M=Medium, L=Low

3. The Fostering Enterprise Innovation component of the project is expected to have the following positive economic and social impacts:
4. To illustrate the magnitude of these impacts, a number of them were quantified using methodologies detailed in the above-mentioned report. The results are summarized below.

5. Direct impact on net tax gains from facilitated Internet penetration growth. The project will boost ISP sector revenues and hence generate additional tax revenues for Government. To estimate the Project impact on the aforementioned variables two scenarios of development have been considered. In the first case the ISP sector will experience a regular growth without Project while in the second case ISP sector growth will be facilitated by the Project activities which will accelerate usage of internet services. The results of the estimate show that in the 10 year timeframe the net gain from the accelerated internet usage will be the following:

- Net increase of accumulated revenues may equal US$ 117 mln (difference of the total accumulated revenue of ISPs in the Scenario 1 and 2);
- Net increase of Government tax revenues including social payments may equal US$ 27 mln (difference of the total accumulated tax revenues from ISPs in the Scenario 1 and 2);
- The Net present value (NPV) for the Government will be US$ 12.6 mln at 10% discount rate.
6. **Economic impact of broadband growth.** This impact was estimated on the basis of recent evidence documented by the World Bank (every 10% increase in broadband penetration contributes to economic growth by 1.38%)\(^\text{72}\), and by UNCTAD (one percent increase in country's ICT infrastructure generates 0.10-0.15% increase in per capita GDP)\(^\text{73}\). As a result, it is estimated that, if Armenia succeeds to reach the current average level of broadband penetration in the Eastern European countries (15%) then its contribution to GDP growth will account about 2%.

7. **Economic impact of venture fund.** It is expected that the VC investment will support increased revenues of investee companies. Assuming that the VC investment generates 20% IRR within the investment horizon of 7 years then it may support an increase in sales of investee companies by at least the factor of 3 in 7 years. As it is supposed that VC will target innovative companies with higher rate of R&D intensity it could be expected that it will trigger private R&D investment in the invested companies. A US$ 6 mln VC investment\(^\text{74}\) could support the generation of cumulative volume of private R&D ranging US$ 25-55 mln within 7 years. Additionally, this amount will be coupled with the R&D investment facilitated by the Idea and Innovation Matching grants. With the assumption that it will generate additional private R&D expenditures proportional to the Projects inputs the volume of R&D expenditures elicited by the innovation grant component may total US$ 1.5 mln.

8. **Direct impact on jobs and IT/ITES revenues.** According to preliminary estimates, the sales force initiative is anticipated to generate US$ 2.5 mln sales deals during the lifetime of the Project in the base scenario which may reach US$ 4 mln in the optimistic scenario. If the sector labor productivity continues to grow with same growth rate as it was during 2006-2009 (6% per annum) then it may be anticipated that new contracts will lead to creation of 60-90 new jobs in the short-run. But in the long-run it is anticipated that this will lead to higher volume of exports through upgraded market linkages and increased opportunities for exports of the innovative technology/knowledge intensive sector\(^\text{75}\).

9. In conclusion, it is expected that the Armenia E-Society and Innovation for Competitiveness Project is potentially laying the foundation for increased opportunities in R&D, investment and employment in the economy. It also potentially triggers increased production and increased volume of exports. In the long-term the aforementioned leads to GDP growth and overall competitiveness increase. The two components of the Project create additional synergy through inter-linkages and inter-related activities and impacts. It appears that the Project will have more significant positive impacts in the long-run rather than in the short-run, in line with its objective to create a truly knowledge-based economy.

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\(^\text{72}\) Information and Communications for Development 2009, World Bank.

\(^\text{73}\) Impact of ICT on economic growth in developing countries, 2006, UNCTAD.

\(^\text{74}\) It is assumed that the public contribution will be at maximum level of $3 millions with proportional contribution from private investors.

\(^\text{75}\) According to UNSTAD (UN, 2008) high-tech exports make up only 1 percent of Armenian exports and high-tech imports make up only 5.8 percent of total imports (on average from 2002-2008). These poor indicators document the poor performance of R&D in Armenia and apparent weaknesses in commercialization of the above-mentioned.
Annex 10: Safeguard Policy Issues

Armenia E-Society and Innovation for Competitiveness Project (EIC)

1. **Social.** The Operational Policy 4.12 will not be triggered for this project. Overall, the activities supported under the Project would not cause a loss of livelihood for the poor or vulnerable people. Project activities will be governed under the screening procedure that will be spelled out in the Operational Manual, to ensure no impact that will trigger OP 4.12 will indeed occur. The PIU would send to the task team the project implementation reports in which compliance with the policy requirements would be confirmed.

2. The Project will support developing a nationwide broadband backbone network based on a private-public partnership (PPP). It is expected that this activity will primarily finance the installment of networks and other minor works, all of which would be conducted within the existing Right-of-Way and without disturbing roadside businesses or causing any impact that will trigger OP 4.12. Nonetheless, the PPP contract will include clauses that will ensure no such impact would actually occur.

3. The project will also support the provision of mini grants and establishment of the Gyumri Technology Center. The Operational Manual will spell out screening procedures so the grants will not support activities that will require purchasing of private land by grant recipients. The Gyumri Technology Center will be established on the public land and its establishment would not require acquisition of private land.

4. **Environmental.** The Project is rated as environmental Category B due to infrastructure investments planned under its components 1 and 2. Civil works to be financed from the Project proceeds are not expected to have any significant or irreversible impacts, because the works for laying optic fiber cables will follow the right-of-way of the existing motor roads or other major infrastructure (power, pipelines, railways) and the premises for Gyumri technology center will be provided through the rehabilitation of the existing building. Expected negative impacts of these works are minor and typical for any small scale civil works, such as inconvenience from disrupted traffic, generated noise, dust, and vibration; generation of access material from earth works and other construction waste; pollution of air and water from the operation and servicing of the construction machinery; and potential harm to the visual appearance of construction sites due to improper reinstatement. These risks may be effectively mitigated through the application of general good construction practice and the adherence to the recommendations provided in the environmental management documents developed for the Project according to the requirements of OP/BP 4.01 Environmental Assessment. Provision of the broadband backbone infrastructure implies installation of the wireless towers. Depending on the choice of location for the placement of these towers, their construction and operation may affect valuable natural habitats and also cause mortality of birds due to aerial collisions. Therefore, OP/BP 4.04 Natural Habitats is triggered to ensure adequate screening and selection of the potential locations of wireless towers. Earth works in undeveloped landscapes may come across chance finds and OP/BP 4.11 is triggered to secure proper handling of any elements of presently unknown historical heritage in case they are encountered.
5. Future operation of the e-society technical infrastructure and the Gyumri technology center will increase efficiency of the governance and improve the business environment in Armenia. The only potential long term negative impact is expected from periodic minor maintenance works on the installed wireless towers; though the strictly localized and modest nature makes this impact insignificant.

6. The Borrower commissioned a comprehensive study to develop Environmental and Social Management Framework (ESMF), which provides an overview of the telecommunications sector in Armenia, describes the legal and institutional context for the Project implementation, lists the main expected environmental and social impacts of the e-Society and digital inclusion infrastructure, and recommends measures for their mitigation. As a result of the ESMF study OP/BP 4.04 Natural Habitats and OP/BP 4.11 Physical Cultural Resources have been triggered in addition to the OP/BP 4.01 Environmental Assessment triggered at the concept stage. Environmental Checklist for Small Construction and Rehabilitation Activities was used to carry out a simplified environmental overview of the rehabilitation of Gyumri technology center and to develop an Environmental Management Plan for it.

7. Responsibility for the project implementation lies fully in the Ministry of Economy, which will have the overall project coordination role. High-level management of the project will be carried out by the PSC. Day-to-day management of specific activities under the project will be assured by the respective agencies, namely: NCFA will take lead on the provision of the nationwide broadband backbone infrastructure (under component 1), EKENG will head the E-citizen program (also under component 1), while the EIF will be in charge of fostering enterprise innovation, including establishment of the Gyumri technology center (under component 2). FFPMC will be responsible for the financial management, disbursement, and procurement under the project. FFPMC, operating under the Ministry of Finance for a number of years, has an extensive experience of contract management under the Bank financed projects. FFPMC and the Ministry of Economy will sign civil works contracts on behalf of the Borrower and will oversee quality of works, including their environmental compliance.

8. On July 13, 2010 the ESMF for the broadband backbone infrastructure and the simplified EMP (environmental checklist) for the Gyumri technology center were disclosed in-country through the Internet and on July 14, 2010 a stakeholder meeting was held to discuss the project design and its technical implication, including these environmental documents. The meeting participants in general welcomed the measures proposed in the environmental documents for avoiding or mitigating possible negative impacts. Suggestions were made to further clarify the roles and responsibilities of various agencies involved in the screening process. These suggestions have already been incorporated. On July 15, 2010, a discussion of the preliminary design of Gyumri technology center was held in Gyumri municipality, at the office of the municipal chief architect, with participation of all concerned parties. The finalized ESMF and EMP were posted in the Infoshop on September 3, 2010.
Annex 11: Project Preparation and Supervision

Armenia E-Society and Innovation for Competitiveness Project (EIC)

1. The table below summarizes the project preparation and implementation schedule. This schedule is subject to change based on the final results of the PHRD grant.

<table>
<thead>
<tr>
<th>Event</th>
<th>Planned</th>
<th>Actual</th>
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</thead>
<tbody>
<tr>
<td>PCN review</td>
<td>June 25, 2009</td>
<td>June 25, 2009</td>
</tr>
<tr>
<td>Initial PID to PIC</td>
<td>June 17, 2009</td>
<td>June 17, 2009 / Oct. 30, 2009</td>
</tr>
<tr>
<td>Initial ISDS to PIC</td>
<td>June 17, 2009</td>
<td>June 17, 2009 / Nov. 2, 2009</td>
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<tr>
<td>Quality Enhancement Review</td>
<td>April 26, 2010</td>
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<tr>
<td>Decision Meeting</td>
<td>September 2, 2010</td>
<td>September 2, 2010</td>
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<td>Appraisal</td>
<td>September 7, 2010</td>
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<td>Negotiations</td>
<td>September 30, 2010</td>
<td>October 6, 2010</td>
</tr>
<tr>
<td>Board/RVP approval</td>
<td>November 30, 2010</td>
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<tr>
<td>Planned date of effectiveness</td>
<td>January 10, 2011</td>
<td></td>
</tr>
<tr>
<td>Planned date of mid-term review</td>
<td>January 10, 2013</td>
<td></td>
</tr>
<tr>
<td>Planned closing date</td>
<td>December 31, 2014</td>
<td></td>
</tr>
</tbody>
</table>

2. Key institutions responsible for preparation of the project:

- Ministry of Economy
- National Competitiveness Foundation of Armenia (NCFA)
- E-Governance Project Implementation Unit of the Ministry of Finance (EKENG)
- Enterprise Incubator Foundation (EIF)
- FFPMC of the Ministry of Finance

3. Bank staff and consultants who worked on the project included:

<table>
<thead>
<tr>
<th>Name</th>
<th>Title/Role</th>
<th>Unit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Juan Navas-Sabater</td>
<td>Lead ICT Policy Specialist, TTL</td>
<td>TWICT</td>
</tr>
<tr>
<td>Karen Grigorian</td>
<td>Senior Economist, Co-TTL</td>
<td>ECSF2</td>
</tr>
<tr>
<td>Sandra Sargent</td>
<td>Operations Officer</td>
<td>TWICT</td>
</tr>
<tr>
<td>Seda Pahlavooni</td>
<td>e-Government Specialist</td>
<td>TWICT</td>
</tr>
<tr>
<td>Jean-Louis Racine</td>
<td>Science, Tech. &amp; Innov. Specialist</td>
<td>ECSF2</td>
</tr>
<tr>
<td>Natasha Kapil</td>
<td>Private Sector Development Specialist</td>
<td>ECSF1</td>
</tr>
<tr>
<td>Yevgeny Kuznetsov</td>
<td>Senior Economist</td>
<td>PRMED</td>
</tr>
<tr>
<td>Deepak Bhatia</td>
<td>Regional ICT Coordinator for ECA</td>
<td>TWICT</td>
</tr>
<tr>
<td>Randeep Sudan</td>
<td>Practice Leader E-Gov/IT Industry</td>
<td>TWICT</td>
</tr>
<tr>
<td>Michael Edwards</td>
<td>Lead Financial Sector Specialist</td>
<td>ECSF2</td>
</tr>
<tr>
<td>Isfandyar Zaman Khan</td>
<td>Financial Sector Specialist</td>
<td>ECSF1</td>
</tr>
<tr>
<td>Oleg Petrov</td>
<td>E-Development Thematic Group Coord.</td>
<td>TWICT</td>
</tr>
<tr>
<td>Lyudmila Bujoreanu</td>
<td>Consultant</td>
<td>TWICT</td>
</tr>
<tr>
<td>Marc Jean Yves Lixi</td>
<td>Senior Operations Officer</td>
<td>AFTRL</td>
</tr>
<tr>
<td>David Satola</td>
<td>Senior Counsel</td>
<td>LEGPS</td>
</tr>
</tbody>
</table>
4. Bank funds expended to date on project preparation:
   1. Bank resources: $340,000
   2. Trust funds: $990,000 (PHRD)
   3. Total: $1,330,000

5. Estimated Approval and Supervision costs:
   1. Remaining costs to approval: $50,000
   2. Estimated annual supervision cost: $150,000
Annex 12: Documents in the Project File
Arménie E-Société et Innovation pour la Compétitivité

1. Project Concept Note.
3. Integrated Safeguards Data Sheet.
4. Minutes of the PCN review meeting.
5. PPF request package.
7. Environmental and Social Management Framework (ESMF).
16. Report on Broadband Backbone component. DETECON.
19. e-ID Action Plan, EKENG OJSC.
23. Armenia IT Sector, EIF, 2009

### Annex 13: Statement of Loans and Credits

**Armenia E-Society and Innovation for Competitiveness Project (EIC)**

<table>
<thead>
<tr>
<th>Project ID</th>
<th>FY</th>
<th>Purpose</th>
<th>Original Amount in US$ Millions</th>
<th>Difference between expected and actual disbursements</th>
</tr>
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<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>IBRD</td>
<td>IDA</td>
</tr>
<tr>
<td>P116681</td>
<td>2010</td>
<td>IRRIGATION REHABILITATION EMERGENCY PROJ</td>
<td>30.00</td>
<td>0.00</td>
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<tr>
<td>P107772</td>
<td>2009</td>
<td>2nd Education Quality &amp; Relevance APL2</td>
<td>0.00</td>
<td>25.00</td>
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<tr>
<td>P115109</td>
<td>2009</td>
<td>Access to Finance for SME</td>
<td>50.00</td>
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<tr>
<td>P115486</td>
<td>2009</td>
<td>LIFELINE ROADS IMPROVEMENT PROJECT</td>
<td>36.60</td>
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<tr>
<td>P104467</td>
<td>2007</td>
<td>HLTH SYS MOD (APL2)</td>
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<td>22.00</td>
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<tr>
<td>P099630</td>
<td>2007</td>
<td>Judicial Reform Project 2</td>
<td>0.00</td>
<td>22.50</td>
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<tr>
<td>P094225</td>
<td>2007</td>
<td>SIF 3</td>
<td>0.00</td>
<td>33.00</td>
</tr>
<tr>
<td>P057880</td>
<td>2006</td>
<td>URBAN HEAT</td>
<td>0.00</td>
<td>15.00</td>
</tr>
<tr>
<td>P083352</td>
<td>2006</td>
<td>RENEW ENERGY</td>
<td>0.00</td>
<td>5.00</td>
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<tr>
<td>P087011</td>
<td>2006</td>
<td>RUR ENT &amp; AGRIC DEVT</td>
<td>0.00</td>
<td>22.00</td>
</tr>
<tr>
<td>P099832</td>
<td>2006</td>
<td>AVIAN FLU - AM</td>
<td>0.00</td>
<td>6.25</td>
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<tr>
<td>P087641</td>
<td>2005</td>
<td>YEREVAN WATER/WW SERVS</td>
<td>0.00</td>
<td>20.00</td>
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<tr>
<td>P087620</td>
<td>2004</td>
<td>SOC PROT ADMIN</td>
<td>0.00</td>
<td>5.15</td>
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<tr>
<td>P088499</td>
<td>2004</td>
<td>IRRIG DAM SAFETY 2</td>
<td>0.00</td>
<td>6.75</td>
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<tr>
<td>P074503</td>
<td>2004</td>
<td>EDUC QUAL &amp; RELEVANCE (APL #1)</td>
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<td>P073974</td>
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<td>HEALTH SYS MOD (APL #1)</td>
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<td>P063398</td>
<td>2004</td>
<td>MUN WATER &amp; WW</td>
<td>0.00</td>
<td>43.00</td>
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<tr>
<td>P060786</td>
<td>2004</td>
<td>PUB SECT MOD</td>
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<td>10.15</td>
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<tr>
<td></td>
<td></td>
<td>Total:</td>
<td>116.60</td>
<td>298.80</td>
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### ARMENIA

**STATEMENT OF IFC’s Held and Disbursed Portfolio**

In Millions of US Dollars

<table>
<thead>
<tr>
<th>FY Approval</th>
<th>Company</th>
<th>Committed</th>
<th>Disbursed</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>IFC</td>
<td>IFC</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Loan</td>
<td>Equity</td>
</tr>
<tr>
<td>2002</td>
<td>ACBA Leasing</td>
<td>2.00</td>
<td>0.27</td>
</tr>
<tr>
<td>2004</td>
<td>Armeconombank</td>
<td>2.00</td>
<td>0.00</td>
</tr>
<tr>
<td>2000</td>
<td>Hotel Armenia</td>
<td>0.00</td>
<td>0.00</td>
</tr>
<tr>
<td>2004</td>
<td>Hotel Armenia</td>
<td>0.00</td>
<td>0.00</td>
</tr>
<tr>
<td>2006</td>
<td>Inecobank</td>
<td>3.00</td>
<td>1.30</td>
</tr>
<tr>
<td>2006</td>
<td>NAREK</td>
<td>5.20</td>
<td>0.00</td>
</tr>
<tr>
<td></td>
<td>Total portfolio:</td>
<td>12.20</td>
<td>1.57</td>
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<tr>
<td>FY Approval</td>
<td>Company</td>
<td>Approvals Pending Commitment</td>
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<tr>
<td>------------</td>
<td>---------</td>
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<tr>
<td></td>
<td></td>
<td>Loan</td>
<td>Equity</td>
</tr>
<tr>
<td></td>
<td></td>
<td>0.00</td>
<td>0.00</td>
</tr>
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</table>

Total pending commitment: 0.00 0.00 0.00 0.00


Annex 14: Country at a Glance

Armenia E-Society and Innovation for Competitiveness Project (EIC)

### Armenia at a glance

#### Poverty and Social

<table>
<thead>
<tr>
<th></th>
<th>2008</th>
<th>2009</th>
</tr>
</thead>
<tbody>
<tr>
<td>Population, midyear (millions)</td>
<td>Armenia: 3.1</td>
<td>Asia: 441</td>
</tr>
<tr>
<td>GNI per capita (Atlas method, US$)</td>
<td>3,350</td>
<td>7,418</td>
</tr>
<tr>
<td>GNI (Atlas method, US$ billions)</td>
<td>10.3</td>
<td>3,274</td>
</tr>
</tbody>
</table>

#### Key Economic Ratios and Long-Term Trends

<table>
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<tr>
<th></th>
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<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>GDP (US$ billions)</td>
<td>1.5</td>
<td>9.2</td>
<td>11.9</td>
<td>11.5</td>
</tr>
<tr>
<td>Gross capital formation/GDP</td>
<td>19.1</td>
<td>37.8</td>
<td>40.8</td>
<td>40.8</td>
</tr>
<tr>
<td>Exports of goods and services/GDP</td>
<td>19.0</td>
<td>19.2</td>
<td>14.7</td>
<td>14.7</td>
</tr>
<tr>
<td>Gross domestic savings/GDP</td>
<td>-14.7</td>
<td>17.8</td>
<td>16.8</td>
<td>16.8</td>
</tr>
<tr>
<td>Gross national savings/GDP</td>
<td>-2.1</td>
<td>31.1</td>
<td>30.2</td>
<td>30.2</td>
</tr>
<tr>
<td>Current account balance/GDP</td>
<td>-21.3</td>
<td>-6.4</td>
<td>-11.6</td>
<td>-11.6</td>
</tr>
<tr>
<td>Interest payments/GDP</td>
<td>-2.0</td>
<td>1.2</td>
<td>0.7</td>
<td>0.7</td>
</tr>
<tr>
<td>Total debt/GDP</td>
<td>42.6</td>
<td>31.6</td>
<td>28.7</td>
<td>28.7</td>
</tr>
<tr>
<td>Total stock of debt/exports</td>
<td>11.0</td>
<td>6.5</td>
<td>3.2</td>
<td>3.2</td>
</tr>
<tr>
<td>Present value of debt/stock of debt</td>
<td>-29.0</td>
<td>21.2</td>
<td>-21.2</td>
<td>-21.2</td>
</tr>
<tr>
<td>Present value of debt/exports</td>
<td>-78.0</td>
<td>65.3</td>
<td>65.3</td>
<td>65.3</td>
</tr>
</tbody>
</table>

#### GDP Growth

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>GDP (average annual growth)</td>
<td>-4.7</td>
<td>11.3</td>
<td>13.7</td>
<td>6.8</td>
</tr>
<tr>
<td>GDP per capita</td>
<td>-3.0</td>
<td>11.4</td>
<td>13.6</td>
<td>6.6</td>
</tr>
</tbody>
</table>

#### Structure of the Economy

<table>
<thead>
<tr>
<th></th>
<th>1998</th>
<th>2007</th>
<th>2008</th>
</tr>
</thead>
<tbody>
<tr>
<td>Agriculture</td>
<td>34.0</td>
<td>20.3</td>
<td>17.8</td>
</tr>
<tr>
<td>Industry</td>
<td>30.8</td>
<td>43.9</td>
<td>45.0</td>
</tr>
<tr>
<td>Manufacturing</td>
<td>21.9</td>
<td>19.9</td>
<td>14.7</td>
</tr>
<tr>
<td>Services</td>
<td>35.2</td>
<td>36.8</td>
<td>37.2</td>
</tr>
<tr>
<td>Household final consumption expenditure</td>
<td>103.6</td>
<td>72.0</td>
<td>72.7</td>
</tr>
<tr>
<td>General gov't final consumption expenditure</td>
<td>111.1</td>
<td>103.3</td>
<td>116.4</td>
</tr>
<tr>
<td>Imports of goods and services</td>
<td>52.8</td>
<td>39.2</td>
<td>39.8</td>
</tr>
</tbody>
</table>

#### Growth of Capital and GDP

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Growth of capital and GDP (%)</td>
<td>10.3</td>
<td>10.3</td>
<td>10.3</td>
<td>10.3</td>
</tr>
</tbody>
</table>

#### Growth of Exports and Imports

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Growth of exports and imports (%)</td>
<td>-10.3</td>
<td>-10.3</td>
<td>-10.3</td>
<td>-10.3</td>
</tr>
</tbody>
</table>

Note: 2008 data are preliminary estimates.
This table was produced from the Development Economics LDB database.
* The diamonds show four key indicators for the country (in bold) compared with its income-group average. If data are missing, the diamond will be incomplete.