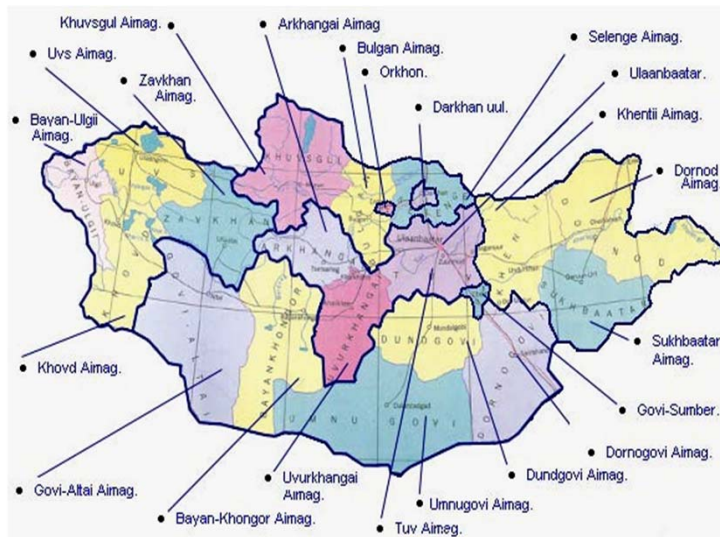# "Technology Commercialization, Demand and Collaboration in Mongolia"

Daejeon, Korea
22 October 2015

Country Profile of Mongolia

Territory	1.56 million sq.km
Population	3.1 million
GDP (current US$) (per capital) (IMF)	4,743 USD
GDP growth (annual)	7.4%
Literacy rate	98%
Rural population	37.3%
Administration	21 province, 310 soum centers
Unemployment	7.8 %
FDI	USD 4.1 bl USD (2015 june)

The Global Competitiveness Index of Mongolia

Key indicators, 2013

Population (millions) 2.9
GDP (US$ billions) 11.5
GDP per capita (US$) 3,972
GDP (PPP) as share (%) of world total 0.02

GDP (PPP) per capita (int'l $), 1990–2013
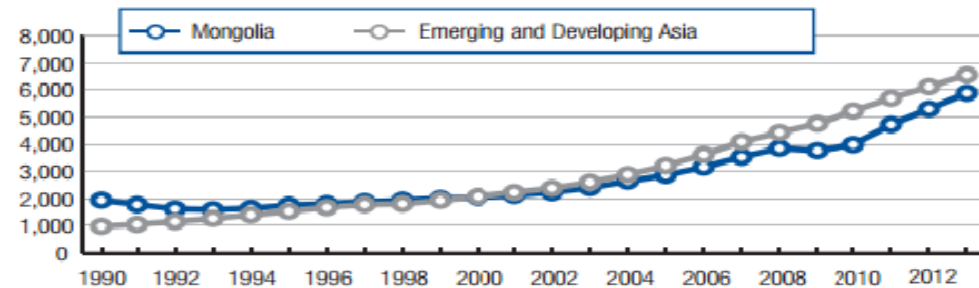
Global Competitiveness Index

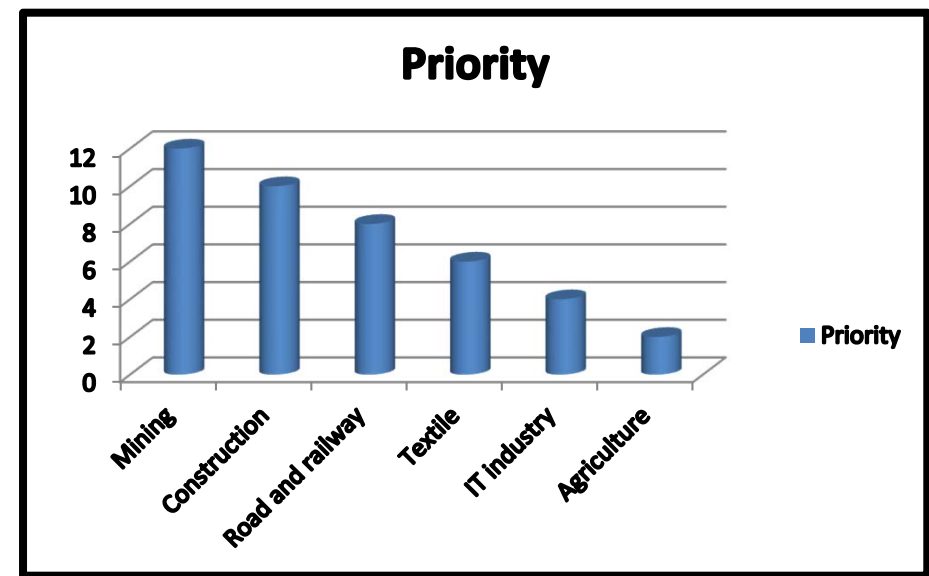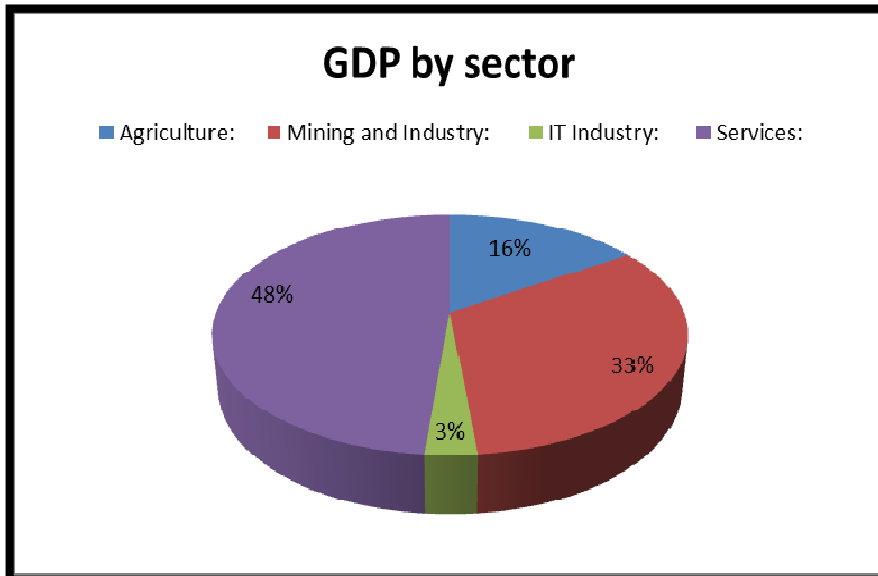|	Rank (out of 144)	Score (1–7)
GCI 2014–2015	**98**	**3.8**
GCI 2013–2014 (out of 148)	107	3.7
GCI 2012–2013 (out of 144)	93	3.9
GCI 2011–2012 (out of 142)	96	3.9
Basic requirements (49.3%)	**105**	**4.0**
Institutions	98	3.4
Infrastructure	112	2.9
Macroeconomic environment	125	3.8
Health and primary education	65	5.8
Efficiency enhancers (43.0%)	**92**	**3.8**
Higher education and training	68	4.4
Goods market efficiency	81	4.2
Labor market efficiency	42	4.5
Financial market development	124	3.2
Technological readiness	81	3.5
Market size	120	2.7

Stage of development
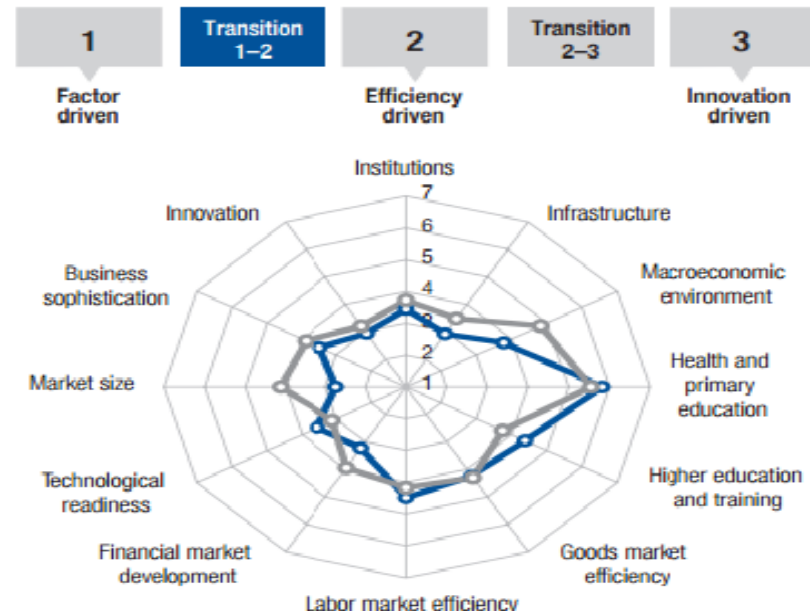
Source: The Global Competitiveness Report 2014–2015

Economic indicators

GDP Growth

(US$ bn)

Year	Value
2008	5.17
2009	4.57
2010	6.69
2011	7.94
2012	10.02

GDP CAGR (2008 – 2012): 17.8%

Foreign Direct Investment

Year	Value
2008	0.8
2009	1.0
2010	1.6
2011	5.3
2012	3.8

FDI CAGR (2008 – 2011): 85.0%

GDP by sector

- Agriculture: 16%
- Mining and Industry: 33%
- IT Industry: 3%
- Services: 48%

Priority

- Mining
- Construction
- Road and railway
- Textile
- IT Industry
- Agriculture
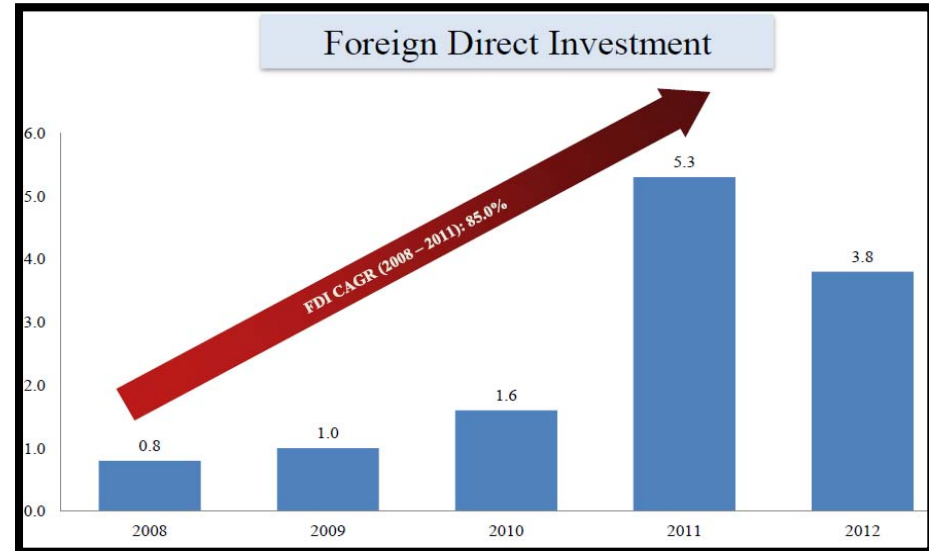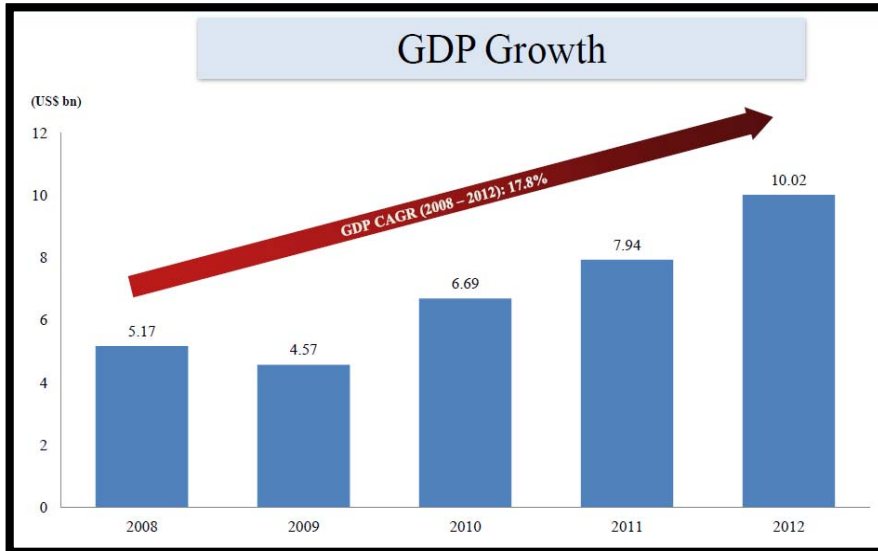
Source: Ministry of Economic Development

Foreign direct investment

FDI by Sectors in 2013.06.30

0.10 0.18 0.38

9.13

90.21

- Geological prospecting, oil exploration & mining
- Trade and catering service
- Bank and financing service
- Light industry
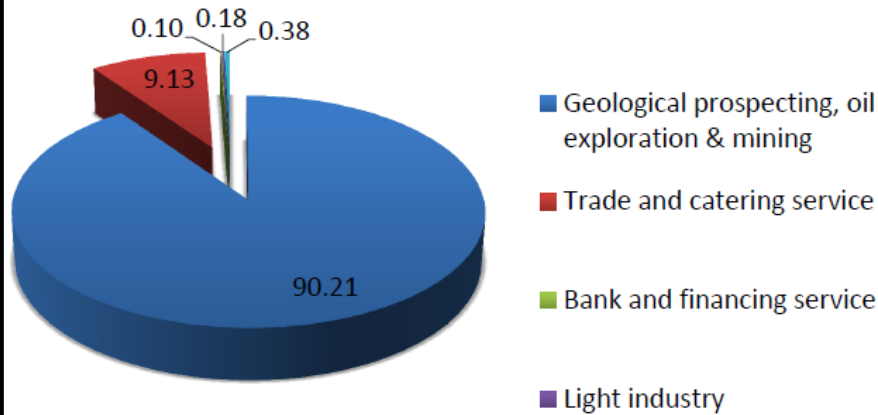
FOREIGN DIRECT INVESTMENT

	2010	2011	2012	2013-06
Total FDI inflow	USD1,0bln	USD4,9bln	USD4,4bln	USD1,4bln*
Number of countries	59	66	64	53*
Number of newly established entities	769	933	774	237*
Number of dissolved or deregistered as foreign invested companies	214	233	117	44*

MONGOLIA INFLATION RATE
Annual Change on Consumer Price Index
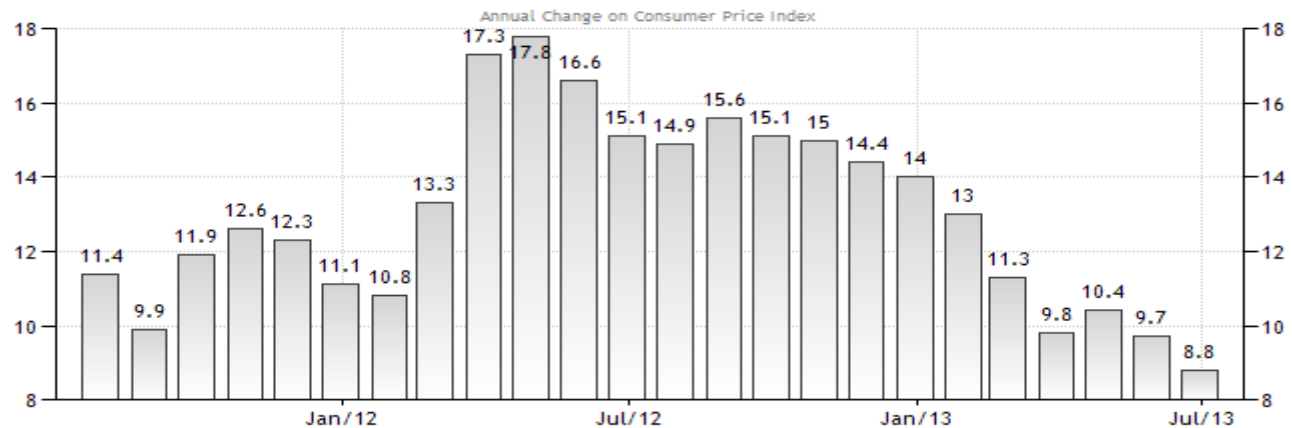
11.4 9.9 11.9 12.6 12.3 11.1 10.8 13.3 17.3 17.8 16.6 15.1 14.9 15.6 15.1 15 14.4 14 13 11.3 9.8 10.4 9.7 8.8

Jan/12   Jul/12   Jan/13   Jul/13

Source: Ministry of Economic Development

Foreign trade

Imports and exports
(Twelve-month percentage change in 3mma, Jan. 2008-July 2013)

Total turnover of foreign trade

EXCHANGE RATE

↑ - to depreciate
↓ - to appreciate
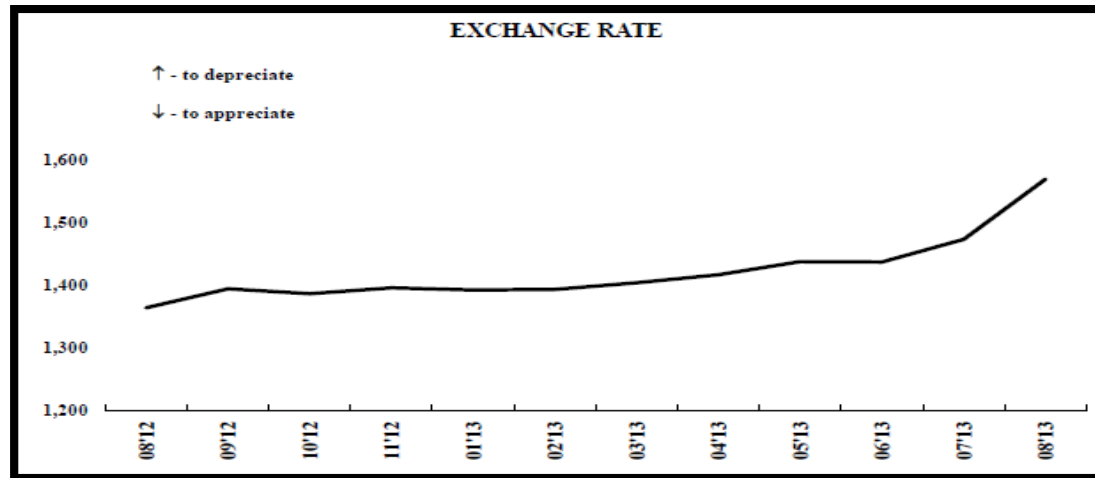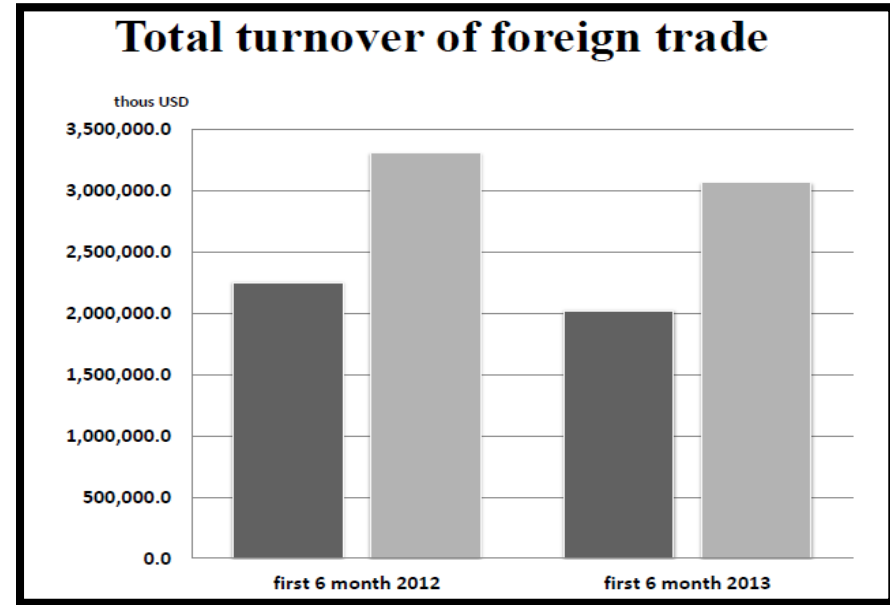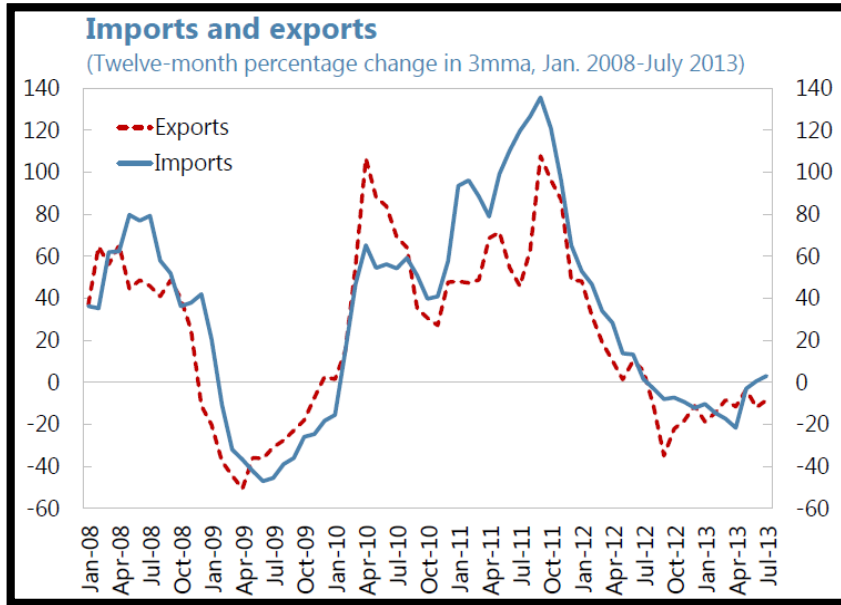
Source: Ministry of Economic Development

Export import

Exports by country
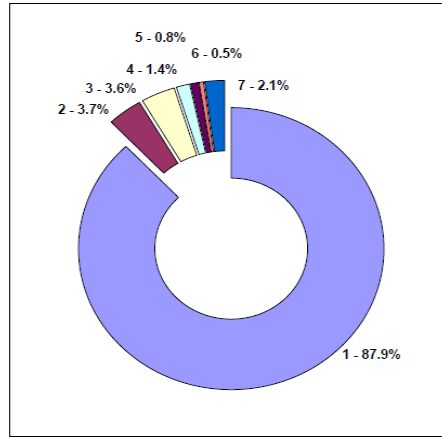
1 -	China	87.9%
2 -	Canada	3.7%
3 -	United Kingdom	3.6%
4 -	Russian Federation	1.4%
5 -	Italy	0.8%
6 -	Federal Republic of Germany	0.5%
7 -	Other	2.1%

*Source: National Statistical office*

Imports by countries of origin
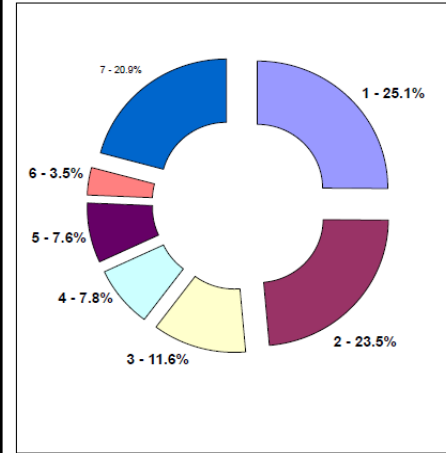
1 -	China	25.1%
2 -	Russian Federation	23.5%
3 -	United States of America	11.6%
4 -	Japan	7.8%
5 -	Republic of Korea	7.6%
6 -	Belarus	3.5%
7 -	Other	20.8%

Structure of export commodities
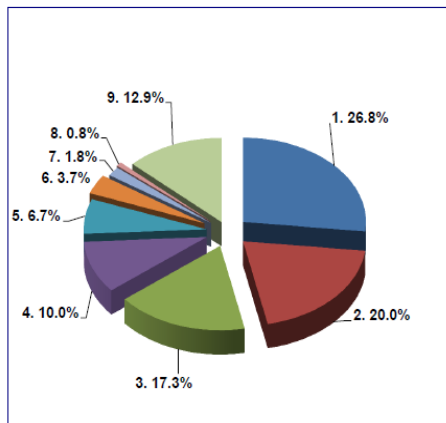
1 -	Coal	26.80%
2 -	Copper concentrates	20%
3 -	Iron ores and concentrates	17.30%
4 -	Crude oil.	10%
5 -	Gold,unwrought or in semi-manufactured forms.	6.70%
6 -	Zinc ores and concentrates	3.70%
7 -	Leucite; nepheline and nepheline syenite; fluorspar.	1.80%
8 -	Molybdenum ores and concentrates.	0.80%
9 -	Other	12.90%

Structure of import commodities
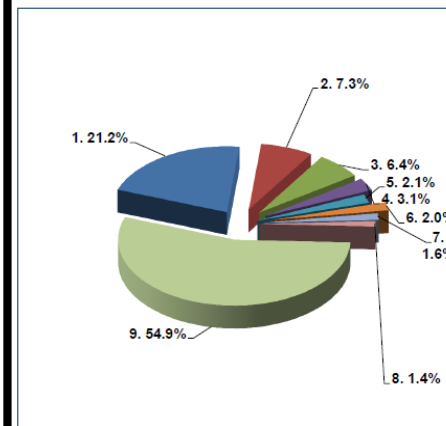
1 -	Petroleum products.	21.20%
2 -	Motor vehicles for the transport of goods.	7.30%
3 -	Motor cars and other motor vehicles principally designed for the transport of persons .	6.40%
4 -	Self-propelled bulldozers, angledozers, graders, levellers, scrapers, mechanical shovels, excavators,tamping machines and road rollers.	3.10%
5 -	Machinery for sorting,screening,crushing,mixing earth.	2.10%
6 -	Parts suitable for use solely or principally with the machinery.	2%
7 -	Electrical apparatus for line telephony or line telegraphy.	1.60%
8 -	New tyres.	1.40%
9 -	Other	54.90%

Source: Ministry of Economic Development

ICT Sector Contribution

Total income of ICT sector (bil.MNT)
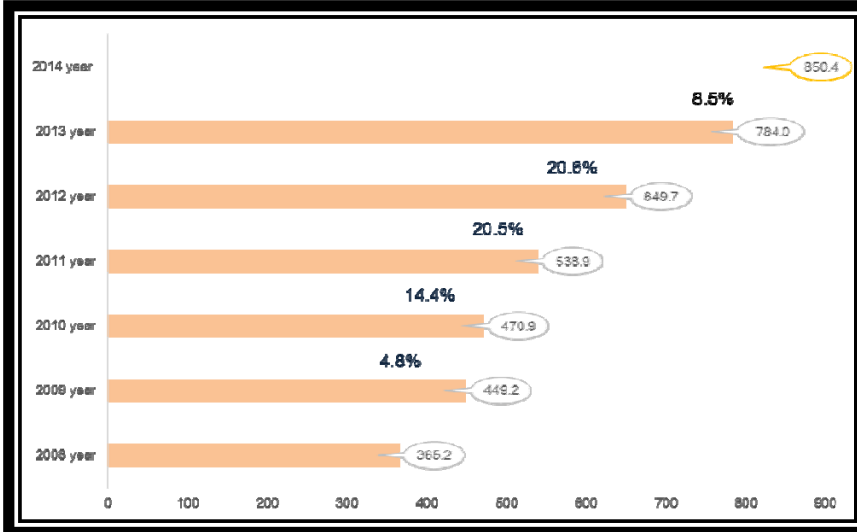
Total income market share (Bil. MNT)

Total investment of ICT sector
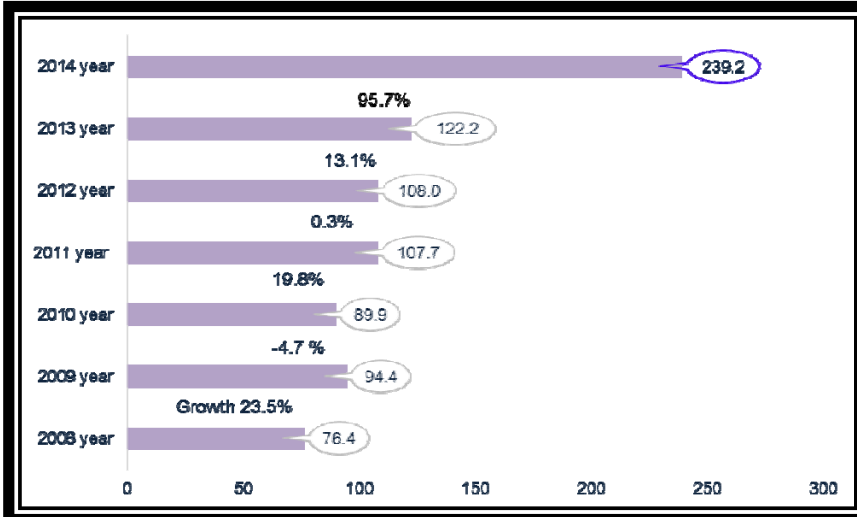
Total found raising to state budget from ICT sector
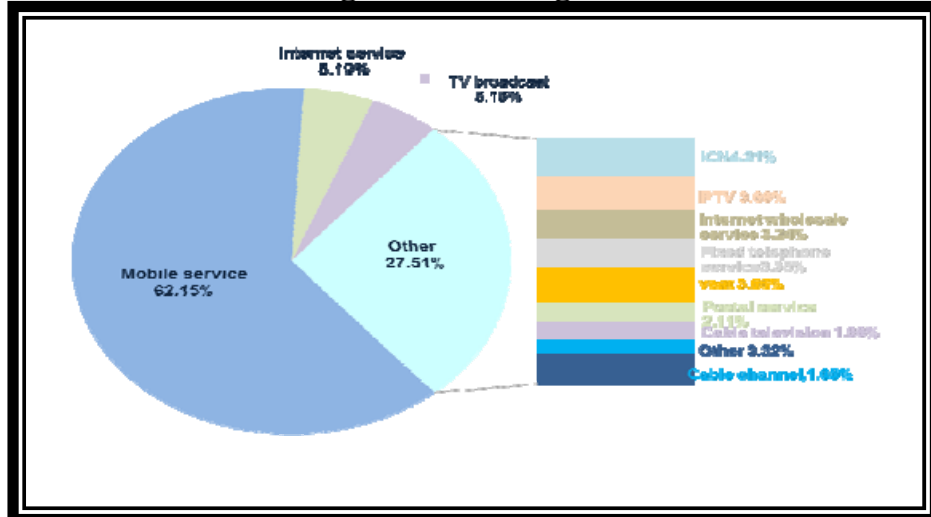
Source: Communications Regulatory Commission, Annual report – 2014

ICT latest policy

Source: White paper of development of information and communications technology of Mongolia – 2013

Legal framework

- Telecommunications law 2001, 2004, 2008
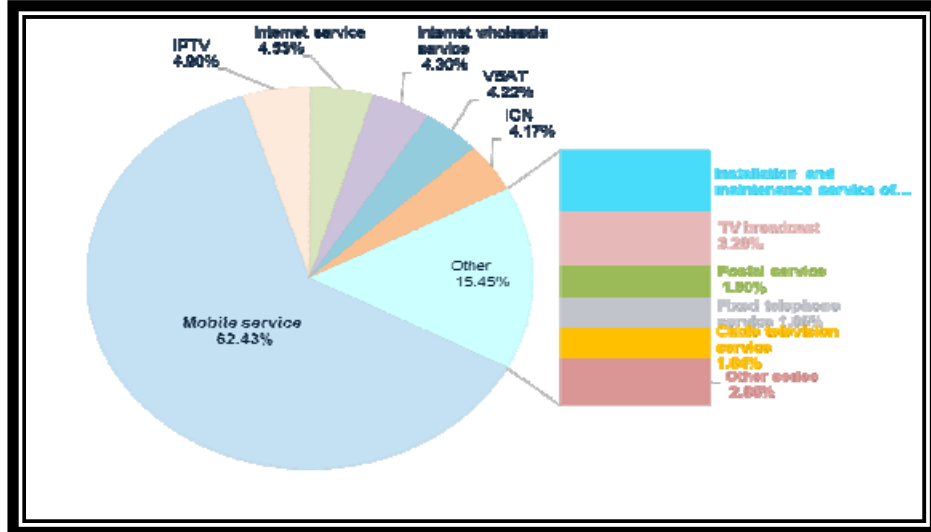
- Foreign Investment Law 1993

- Strategic Entities Foreign Investment Law (SEFIL) in the May 2012 and its regulations March 2013

- Investment Law October 2013

- Securities law 2004, 2013

- Corp Income tax (CIT) 2008

- Personal Income Tax (PIT) laws 2008

- Value added Tax (VAT) 2008

Cooperation background

❖ **<u>Long history</u>**; According to a history, since the mid 400 AD started. In 479 AD, Mongol Nurin Khan negotiated with the Korean Goguryo King to establish an alliance and invade Manchu-descent Didogan.

❖ **<u>Diplomatic relations</u>** between Mongolia and South Korea were established relatively late, in 1990, despite the ancient ties between the two nations.

❖ **<u>High-level Visits</u>** Between Mongolia and Republic of Korea (1999.05. President Kim Dae-jung, 2006.05. President Roh Moo-hyeon, 2011.08. President Lee Myung-bak)

❖ As of November 2011, ROK is the **<u>fifth</u>** largest investment partner of Mongolia.

❖ The **investment** sectors include following :

- **44.4%** is trade and public catering services,
- **11.1%** is geology, mining exploration and production,
- **4.3%** is information and communications technology,
- **3.3%** is health and beauty sector, and
- **36.9%** is other sectors. Totally, 279.7million USD. (as of 2010)

❖ **1973** Korea-invested companies are registered in Mongolia.

Introduction MeGO

VISION

We envision a community in which every citizen can benefit from the use of advanced and innovative technology for their gratification.

MISSION

Our mission is to provide ICT and e-Government capacity building and technology support for the Government, Business, Citizen and Research organizations to achieve mission-driven results, which deliver long term citizen benefits from e-services.

Introduction MeGO

WHAT WE DO

- We do believe that our vision and mission statement will guide us to develop and deploy the Mongolian e-government/e-security training curriculums with their strategic plan by using variety of strategic development and collaboration of our experts in these major.
- E-Government NGO of Mongolia is dedicated to deliver most advanced innovation and technology to the Mongolian Government and business for its best performance.
- Our strategy is to build a bridge between Government, Business, Research and Training institutes and Technology through our NGO. We believe that effective communication between Government, Business, and NGO is the key to the Mongolian successful ICT development, and e-services delivery.
- E-Government NGO of Mongolia is planning to establish a professional network between developed countries and Mongolia in the field of information technology, information security (IS) and education.

Cooperation with Government

Cooperation with Government organization

- ❖ Ministry of Education, Culture and Science (MECS)

- ❖ Information Technology, Post and Telecommunications Authority

- ❖ Communications Regulatory Commission

- ❖ Science and Technology Fund

- ❖ National IT Park (NITP)

Cooperation with companies

Cooperation with companies & SME

❖ Arvis Systems /B.Jargal, SalesDirector/
   Tel:99118261 jack@arvisys.mn

❖ MedMongol /Tseden Khaliunaa, CEO/
   Tel:99068377 haliunaa@medmongol.com

❖ Summit Computer Technology /T.Ganbat, CEO/
   Tel:976-99119920 ganbat@summit.mn

❖ Super Assist Systems LLC : /Director - Buriad Erdenebayar/
   Tel : 976-99180541   erbrmn@super-assist.com

❖ Microciti LLC: /Director - Tsend Nyamkhuu/
   Tel : 976-96660246 nyamkhuu@microciti.com

❖ MXC LLC: /Batsaikhan- Sales Director/
   Tel:976- 99052673 Batbileg@mxc.mn

Present activities

Present activities

International:

- The FCO's cyber security capacity building programme 2015-16

Local:

- Consulting service for Supply chain management system - (Mining company)
- Consulting service for ERP supplier selection module - (Mining company)
- Consulting service for warehouse RFID - (Mining company)
- Tech survey with National Technology park

Expectation

**Further MeGo & companies expecting activities
in Technology Commercialization**

– Establishment of a cooperative network between Korea and Mongolia to transfer emerging technology and outsourcing Mongolian IT entrepreneurs.

– Establishment of IT, and Information Security training center for government officials and enterprises.

– Promotion of e-government applications.

– Conducting scientific research on technology need, diffusion and forecasting.

– Active cooperation with GCC in ICT field.

– Make a bridge between Mongolian and Korean entrepreneurs

Survey

COMPANY PROFILE
SUMMIT COMPUTER TECHNOLOGY LLC
2014

summit computer technology

Information Technology and Consumer electronics

Information technology solution

- System integration
- Infrastructure services
- Professional consultancy
- Information technology audit, outsourcing
- Network solutions
- Network management
- Server management
- Security services

- Summit is major Information Technology company in Mongolia
- 150 professionals throughout the country
- 20% certificated engineers
- Yearly revenue 30 000 000 USD
- More than 60 projects per year

- **Critical power local leader**
- **System integrator data center area**
- **Structure cabling local leader**
- **10 years in business**
- **Strong engineering capability**

Survey

VISION

Our vision is to help people and companies to increase their effectiveness, efficiency and creativeness through the use of IT technologies. We aim at delivering services that meets needs and demands of our customers and establishing long-term partnership with them.

- ❑ **Super Assist system LLC was founded in 2010**

- ❑ **Our activities**

  - ❑ **Software development**

    - ▪ **Windows application**

    - ▪ **Web application**

    - ▪ **Mobile application**

  - ❑ **IT consulting services**

- ❑ **Main fields and direction of system development**

  - ❑ **Medical system development**

  - ❑ **Logistic system development**

  - ❑ **Database management system**

  - ❑ **System development for education sector**

MedInfo

Survey

MICROCITI LLC

Our Vision. Innovative technology solution provider.

Our Mission. Bringing latest technology solutions for our customers at most affordable costs.

Our Strategy. Research -> Diversification -> Sustainable growth.

Company name	MICROCITI
CEO	Nyamkhuu Tsend
Business Line	ICT, Agriculture, Food
City/Country	Ulaanbaatar, Mongolia
Website	www.microciti.com; www.usal.mn;
Contact	Tel +976 9666-0246; E-mail: nyamkhuu@microcit.com;
Foundation	2006

МЕД МОНГОЛ ХХК

VISION:

To be leading company in IT based medical field

Expectation (Mongolian companies)

1	**Livestock house management system having a high-rise structure (based on a distributed sensor network)**	TT/CP	This system is an integrated monitoring system for livestock house management using a distributed sensor network. It includes installation of monitoring sensor for environment (temperature, humidity, ammonia, carbon dioxide, and roughness), operating properly housing facilities with the given conditions (lighting, ventilation fans, scrapers, etc.), and maintaining the prime conditions for breeding. It can be controlled by integrated monitoring and smart devices.	Yes(●) No( )	ETRI
2	**Smart Agriculture Plant System (SAPSys)**	PL/CP	This is a hardware and software platform of smart agriculture plant and consists of control technologies, interface, and smart system using a wireless sensor network for optimal growing environment. It is available to share various DB of food growth through cloud system.	Yes(●) No( )	KETI/맥스포
3	**Smart Cold Chain System**	TT/CP	This system is an integrated system of sensor tags, readers, and service software to manage and control temperature each product as well as vehicle and storage. It can provide temperature history of each product unit to consumers by maintaining the freshness of product.	Yes(●) No( )	KETI
4	**Enterprise Knowledge Portal**	PL	Enterprise Knowledge Portal(EKP) increase a productivity in a group by providing functions such as decision making, sharing information, document management, storage of knowledge and communication. Target Customers: Enterprise, Financial Group, Government and Public Institution, Educational Institution, SMEs. Refer to 'Enterprise Knowledge Portal' in additional attachment (GCC Responses for BizTech Survey)	Yes(●) No( )	가온아이
5	**Environmental control system for greenhouse tomatoes**	TT	This system performs environmental monitoring functions and serves to control the suitable environment for the growth of crops using sensors or actuator in greenhouse. The user can measure environmental information, control greenhouse environment, provide the interface to check the status via operating system.	Yes(●) No( )	ETRI

Expectation (Mongolian companies)

IoT, Home Automation, Education, DIY open platform

When you want IoT or Home automation but
  … consumer devices are not programmable, flexible or expandable …
  … you are new to C/Java programming or electronics …
  … making custom HW/SW embedded design will take time and cost …
      You can choose **ORDO**

Key features

- Targets multiple application & end users (hobbyist, schools, DIY automation, IT environment, embedded systems)
- Could be used straight out of box (consumer product, soldering not needed, wiring not necessary)
- Extendable – 3rd party or DIY custom hardware, software (open platform)
- Several programming options (from configuration-like rules to classic OOP)
- Low cost - controller 40-50 USD, sensor & actuator nodes 10 USD

Design & Architecture

- Controller(s), sensor nodes, actuator nodes, wireless and wired, support for some 3rd party products
- Wireless Mesh + Hierarchical tree topology
- Firmware/OS: **H**ardware **A**bstraction **L**ayer + Custom Interpreter (Virtual Machine)
- Design & configuration tools - GUI, HMI, font, widgets, database
- Front-end for Web, mobile app, desktop application

Hardware overview:

- Controller: Ethernet, Wi-Fi, IEEE 802.15.4 / nRF24, RS-485, IR io, 2G/3G cellular, LCD touch screen, RTC, SD card, GPIO terminal screw blocks, DIN rail mount
- Sensor & actuator: IEEE 802.15.4 / nRF24 MCU+RF+hardware AES-128 SoC ULP
- Support for 3rd party Wi-Fi, SNMP, Modbus devices
- Of the shelf technology: STM32 ARM Cortex M3/M4, ESP8266, SAM R21 / nRF24LE1, Wiznet W5500…

Programming options:

Dummy level – Rule based logic
Newbie level – Flowchart logic
Starter level – BASIC
Advanced level – OOP (VM)
Pro level – C/C++ (native code)

"SUPER ASSIST SYSTEMS" LLC

Super Assist Systems interested in following TechBiz

Medical ICT	Medical Platform, Medical Information Exchange, Medical Information DB	We have developed programs and information systems for health sector in Mongolia since 2010	TT PL CP
Logistic ICT	Logistic Information system	We have developed information system for logistic company in Mongolia for 3 years. We have plan to develop current system in the future.	TT PL CP
System S/W	Data Management S/W	We develop data management systems in Mongolia since 2010	TT PL/CP

Expectation (Mongolian companies)

MICROCITI LLC

What we do:
Drip Irrigation:
- ✓ Consultancy;
- ✓ Solution providing;
- ✓ Calculation;
- ✓ Equipment sales;
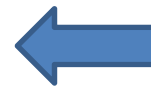- ✓ Installation;
- ✓ Training;

Mobile, compact Irrigation:
- ✓ Consultancy;
- ✓ Equipment sales;
- ✓ Configuration;
- ✓ Training;

Interest ETRI technologies:
- ✓ Env. Control system for greenhouse;
- ✓ Livestock house management system;

TT and PL

What is next to implement:
Automated agriculture:
- ✓ Soil humidity;
- ✓ Soil temperature;
- ✓ Fertilizer level;

Main challenges and needed supports:
- ✓ Lack of professional experience;
- ✓ Financial difficulties;
- ✓ Weather difference;
- ✓ New product for market;

OUTCOMES and ACHIEVEMENTS:
- ✓ Localized, tested technology in harsh weather condition;
- ✓ Leading technology – whistle blower;
- ✓ TT to our customers thru Microciti;

МЕД МОНГОЛ ХХК

The following table describes the response items of the Mongolia TechBiz survey.

No	Item	Method	Description	Needs	Additional Request Information
1	Mobile Ultrasound Medical Device	PL	Mobile Ultrasound Medical Device can be easily with one hand, transmitting ultrasound via a built-in wireless access point to any tablet or smartphone (iOS or Android). Features: Portable pocket size (78mmWx219mmLx38mmH, 390 grams with battery), Handheld and economical price, Battery operation, Transfer image and cine via mobile network. Refer to 'Mobile Ultrasound Medical Device' in additional attachment (GCC Responses for BizTech Survey)	Yes(●) No( )	힐세리온

Thank you for your attention!