ENFORCEMENT OF QOS

Mongolia
Communications Regulatory Commission

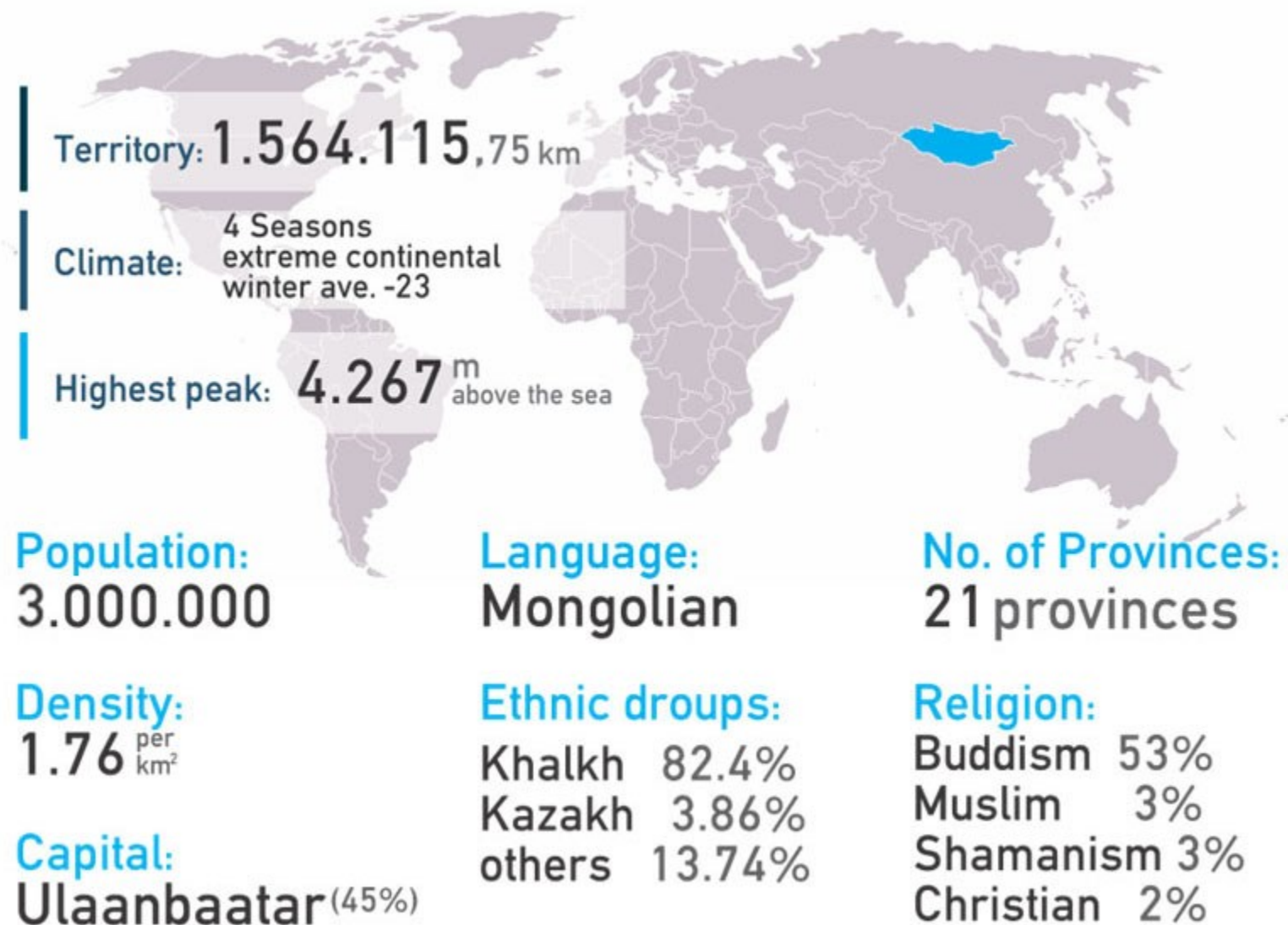21-23 March 2016, New Delhi, India

CONTENTS

I.   **COUNTRY PROFILE**

II.   **STATISTICS OF ICT SECTOR OF MONGOLIA**

III. **MISSION AND MAIN RESPONSIBILITIES OF CRC**

IV. **INSPECTION BRIEF INFORMATION**

V.   **FURTHER PRINCIPLES, IMPLEMENTING MEASURES**

VI. **BRIEF INTRODUCTION OF INSPECTION AND MONITORING ACTIVITIES**

I. COUNTRY PROFILE

Territory: 1.564.115,75 km

Climate: 4 Seasons extreme continental winter ave. -23

Highest peak: 4.267 m above the sea

Population: 3.000.000

Density: 1.76 per km²

Capital: Ulaanbaatar (45%)

Language: Mongolian

Ethnic droups:
Khalkh 82.4%
Kazakh 3.86%
others 13.74%

No. of Provinces: 21 provinces

Religion:
Buddism 53%
Muslim 3%
Shamanism 3%
Christian 2%

I. COUNTRY PROFILE

Timeline

- **1206** — MONGOL EMPIRE:
- **1368** — POST EMPERIAL
- **1691** — UNDER THE QING DYNASTY
- **1911** — INDEPENDENCE: DEC.29,1911
- **1921** — COMMUNIST REGIME
- **1990** — DEMOCRATIC REGIME: SINCE 1990
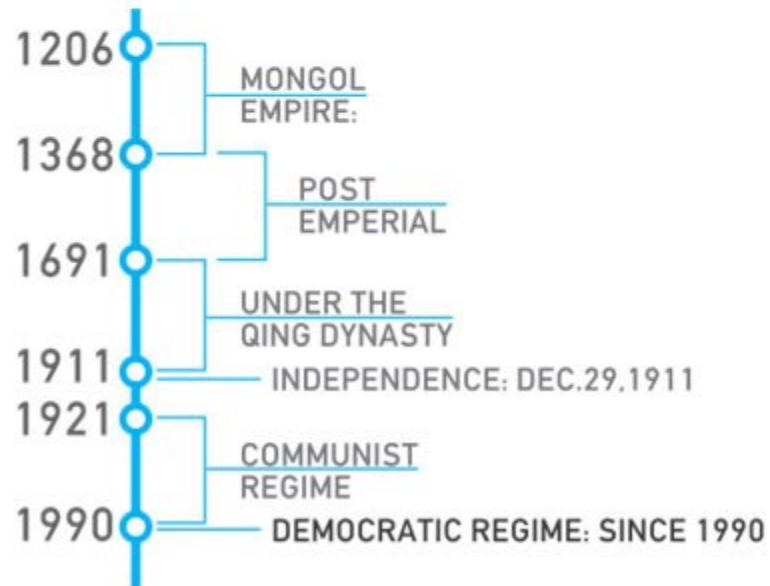
GOVERNMENT AND POLITICS

GOVERNMENT TYPE: Parliamentary

GOVERNMENT: 16 ministries
21 agencies

GDP TOTAL: 11.52 billion ₮

ECONOMY: Agriculture, Mining
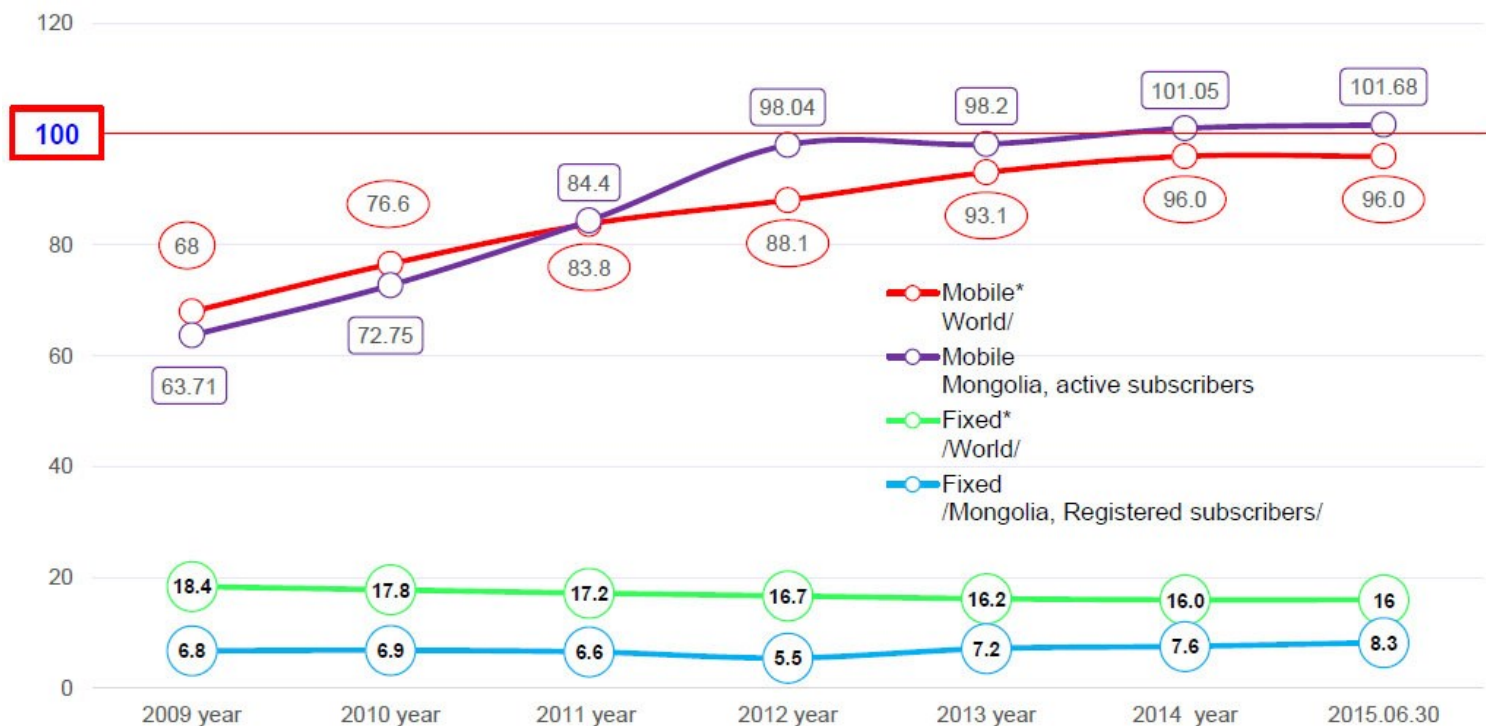
MINERAL RESOURCES: copper, coal, molybdenium

Mobile and fixed telephony

/Telephone line density per 100 people (**registered subscribers**) 2015.06.30/

Legend:
- Mobile* World/
- Mobile Mongolia, active subscribers
- Fixed* /World/
- Fixed /Mongolia, Registered subscribers/

	2009 year	2010 year	2011 year	2012 year	2013 year	2014 year	2015.06.30
Mobile (World)	68	76.6	83.8	88.1	93.1	96.0	96.0
Mobile (Mongolia)	63.71	72.75	84.4	98.04	98.2	101.05	101.68
Fixed (World)	18.4	17.8	17.2	16.7	16.2	16.0	16
Fixed (Mongolia)	6.8	6.9	6.6	5.5	7.2	7.6	8.3

Registered subscribers:

MOBILE (WORLD)	MOBILE (Mongolia)	FIXED (WORLD)	FIXED (Mongolia) 2014
96.0	**101.6**	**16.0**	**8.3**

Number of internet subscribers

2015.06.30/thousand subscribers/

Year	Dial-Up	xDSL	Optic cable	3G,	Wi-Fi	Wi-MAX	VSAT	VPN	Total
2012 year	33	36,695	65,256	520,012	5,281	24,587	174	1,962	654,009
2013 year	271	40,684	107,886	655,107	10,444	24,322	110	2,154	841,143
2014 year		29,244	168,003	1,734,414	11,700	16,394	82	2312	1,962,149
2015.06.30		26,789	148,819	1,917,497	15,754	10,379	175	2436	2,121,849

Number of cable television subscribers

Registered subscribers /2015.06.30/
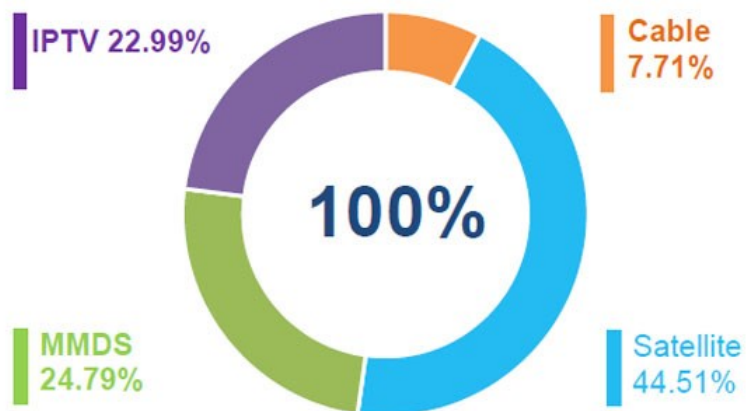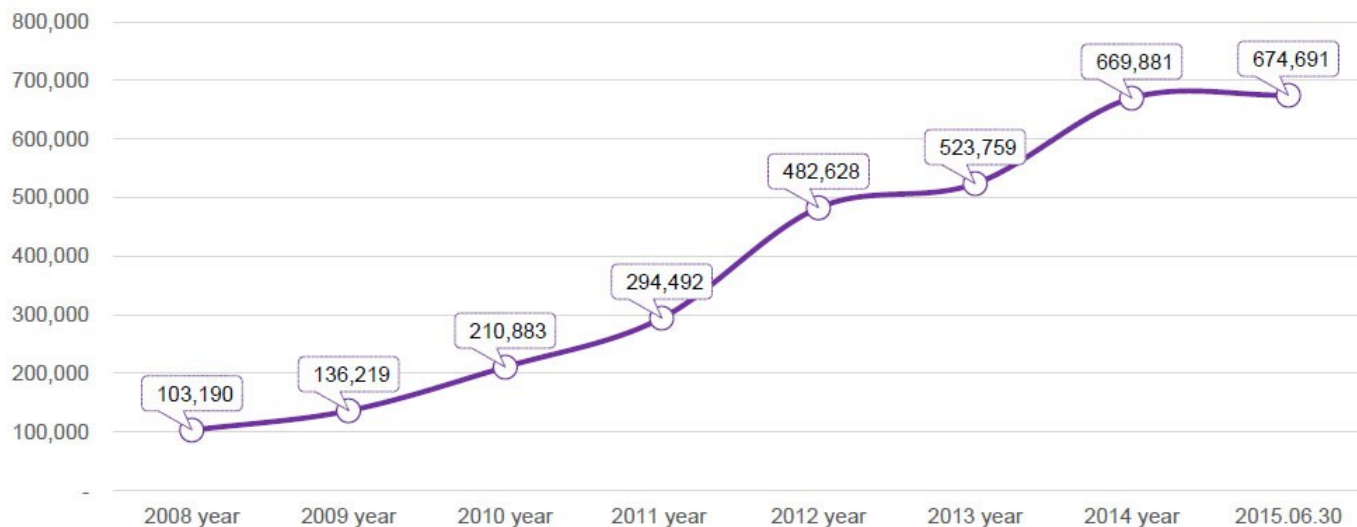
MISSION

To advance the development of ICT sector in Mongolia by making it more efficient and creating fair competition environment which meets the interests and needs of Mongolian citizens.

VALUES

FAIRNESS
TRANSPARENCY
EFFICIENCY

CRC REGULATES
/Law on Licensing Entities/

- Telecommunications
- TV and Radio broadcasting
- Content
- Spectrum Management and Monitoring
- Post
- Internet

AUTHORITY OF CRC
/Law on Communication/

- To prepare a proposal of State Policy
- Licensing
- Certification
- Interconnection
- Tariff
- Competition
- Enforcement of USOF obligation
- Standardization
- Numbering
- Managing Radio Frequency Spectrum
- Settlement of Regulation and spectrum utilization fee
- Resolving disputes

Inspection and monitoring

Planned inspection

Field inspection on service provider

According to the complaint

Field inspection on service provider

Regular inspection and monitoring

- fixed: to take report of QoS, information and others
- mobile: radio frequency, broadcasting

Decision-making principles
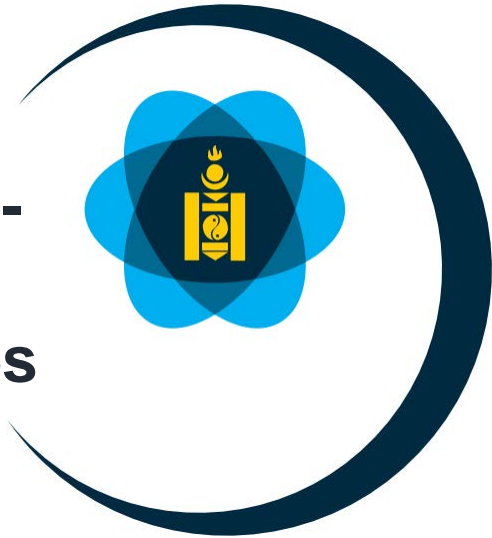
- Fairness

- Transparency

- Efficiency

www.crc.gov.mn

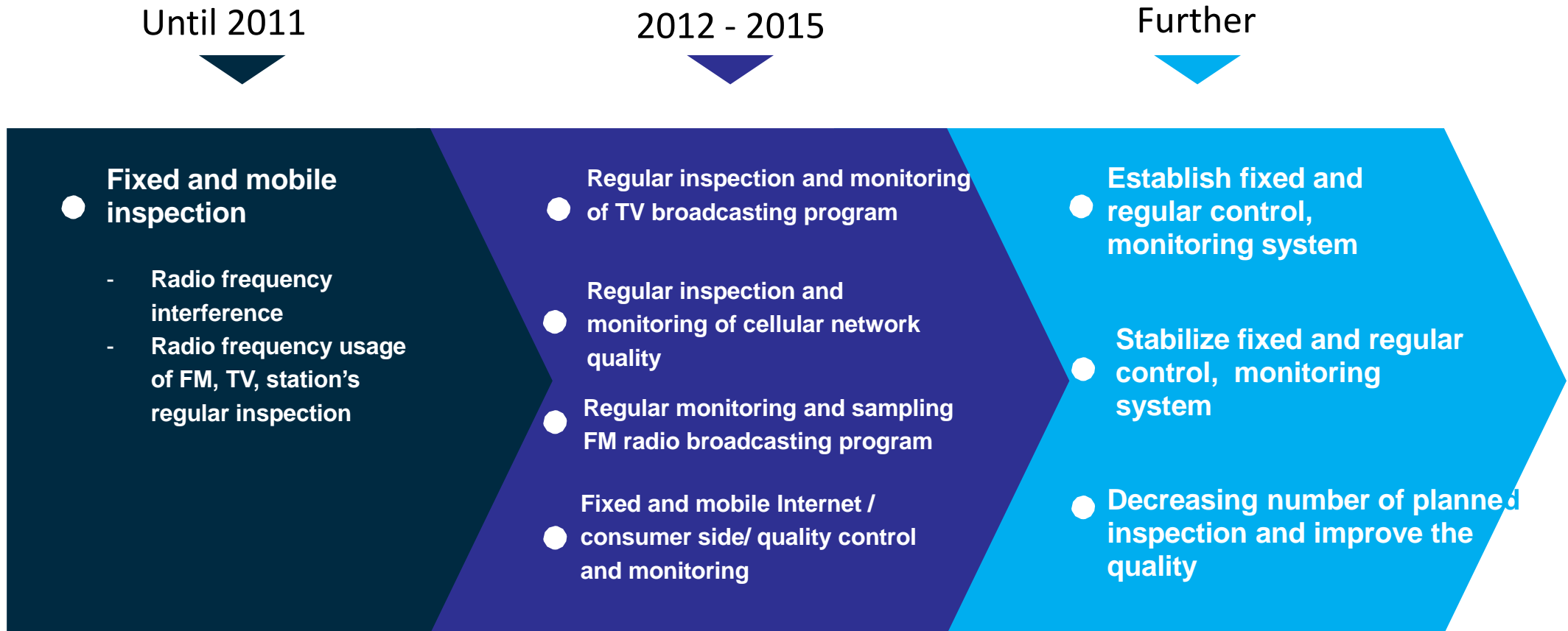**Inspection and monitoring results report to the public annually.**

The number of license holders involved in inspection /field inspection/

V. FURTHER PRINCIPLES, IMPLEMENTING MEASURES

Until 2011

2012 - 2015

Further

- **Fixed and mobile inspection**

  - Radio frequency interference
  - Radio frequency usage of FM, TV, station's regular inspection

- **Regular inspection and monitoring of TV broadcasting program**

- **Regular inspection and monitoring of cellular network quality**

- **Regular monitoring and sampling FM radio broadcasting program**

- **Fixed and mobile Internet / consumer side/ quality control and monitoring**

- **Establish fixed and regular control, monitoring system**

- **Stabilize fixed and regular control, monitoring system**

- **Decreasing number of planned inspection and improve the quality**

Internet quality control

In 2015, The Communications Regulatory Commision organizes consulting bids to control and monitoring Internet Service Providers by international professional organizations because improve internet service speed and quality. And UK's Samknows company won this tender.

Cellular users install special application on smart phone and then can measure internet speed.

Home internet users register to www.mongolia.samknows.com and place user equipment(white box). Then user can measure internet speed.

Control servers

Los Angeles

Frankfurt

Ulaanbaatar

"Whitebox" device placed in selected user's home.

Whitebox measure following parameters.

1. Downstream speed

2. Upstream speed

3. DNS response times

4. UDP Latency

5. UDP Packet Loss

6. YouTube bitrate reliably streamed

Users can control internet quality with these parameters using the www.reporting.samknows.com site by username and password.

Cellular users smart phone application measure following parameters.

1. Downstream speed
2. Upstream speed
3. Latency
4. Loss
5. Jitter

1. Reports quarterly basis

2. Each of the service provider

3. By tariff

4. By service type
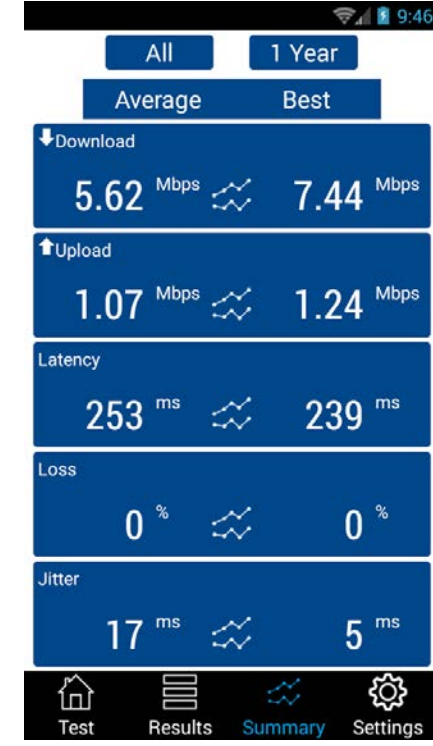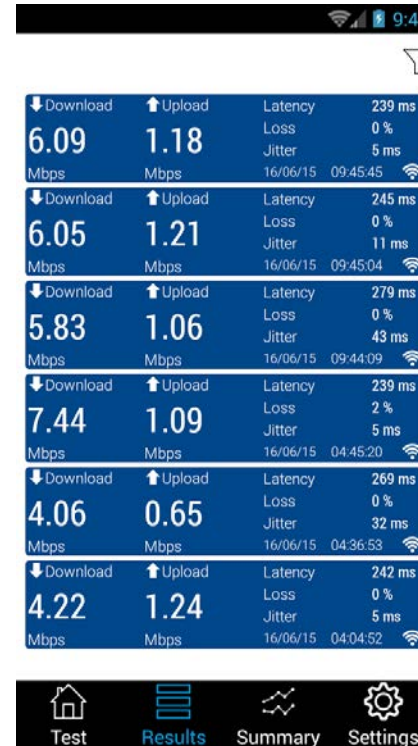
5. By above 6 parameters.

TV broadcasting content monitoring

In 2015, The Communications Regulatory Commission organizes consulting bids to monitoring TV broadcasting content by domestic independent organizations because enforce law and regulatory documents and protect consumer. So, the company named Maxima won this tender.

Maxima's monitoring process:

1 **Recording**

2 **Logging**

3 **Data base**

4 **Report**

COMMUNICATIONS REGULATORY COMMISSION OF MONGOLIA
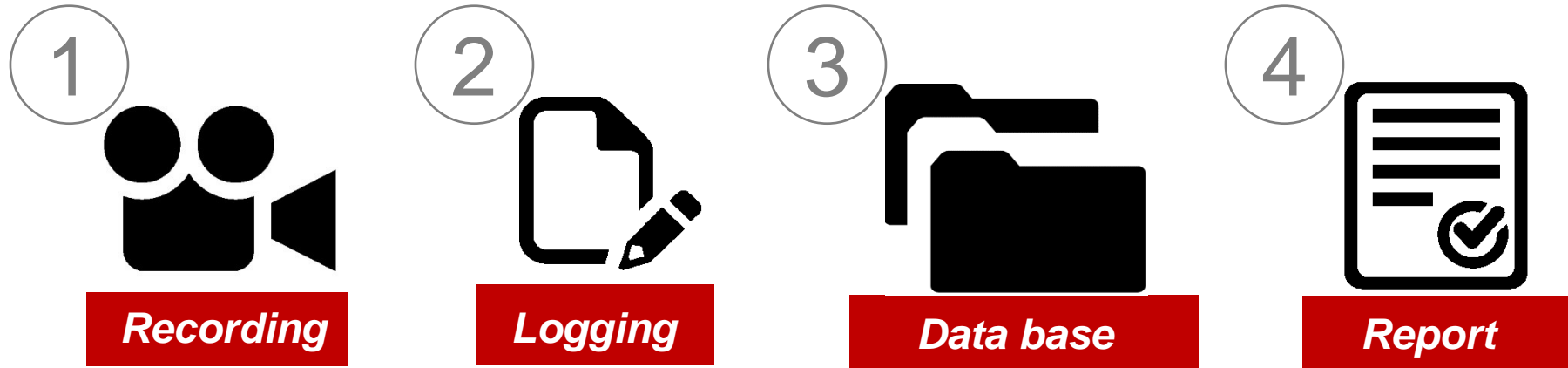
Recording

| Main and backup station

| 24/7

| 60 channel's full record

Logging

- Program type

- Hours, minutes and seconds

- Foreign and local program

- Check schedule

- Banner, chat, in-stream ads

15 experienced shift operator works to ensure its continuity.
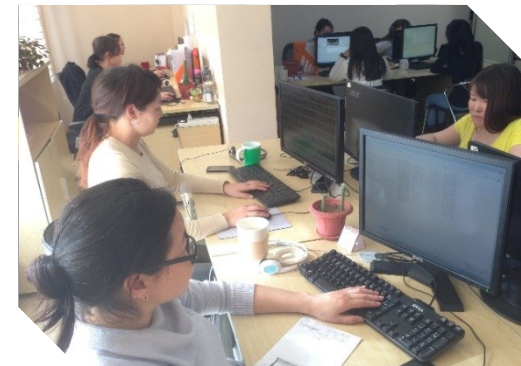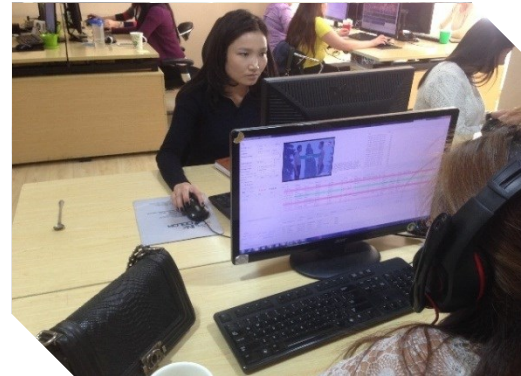
○ 1 hour transmission advertising time

○ Percentage of specialized programs

○ Percentage of foreign and local programs per week etc.

Report

TV broadcasting audio and video measurement

It's purpose is check and measure the broadcasting service provider's video and audio quality, to determine which factors influence.

1. 3G/HD/SD, 2 SDI Inputs Multiformat Waveform Monitor

WFM8200

Performance Monitoring

2. Multiformat Analog and Digital Test Signal Generator

TG 8000

Tektronix®
Communications

3G/HD/SD, 2 SDI Inputs Multiformat Waveform Monitor

- **Video Monitoring Standards and Formats**
    - 3 Gb/s SDI (Level A and Level B) – Option 3G
    - Dual Link SMPTE372M– Standard
    - High Definition SDI – Standard
    - Standard Definition SDI – Standard
    - Composite Analog Video – Option CPS
- **Color Gamut Monitoring**
    - Arrowhead Display – Standard
    - Diamond and Split Diamond Displays – Standard
    - Spearhead Display – Option PROD
    - Luma Qualified Vector (LQV™) – Option PROD
- **Audio Monitoring Standards and Formats**
    - Analog, Digital AES/EBU, Digital Embedded – Option AD
    - Analog & Dolby Digital and Dolby E – Option DDE
- **Measurement and Analysis**
    - Eye Pattern Display & Jitter Readouts – Option EYE

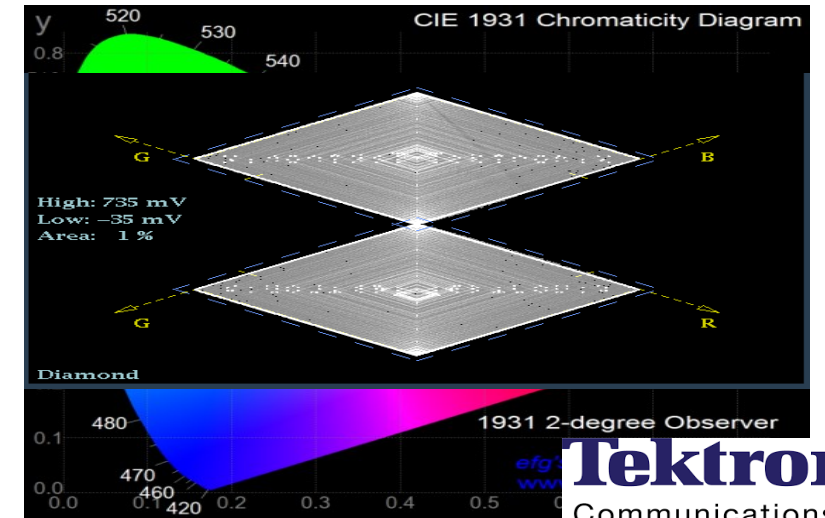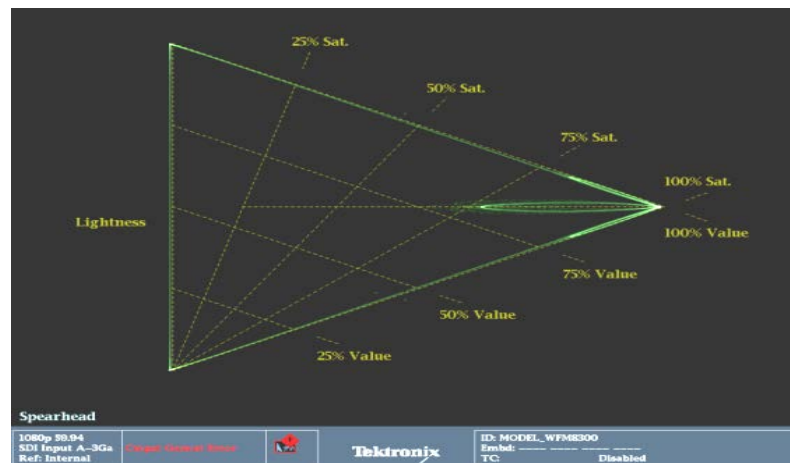## Multiformat Video monitoring capabilities

Video Monitors
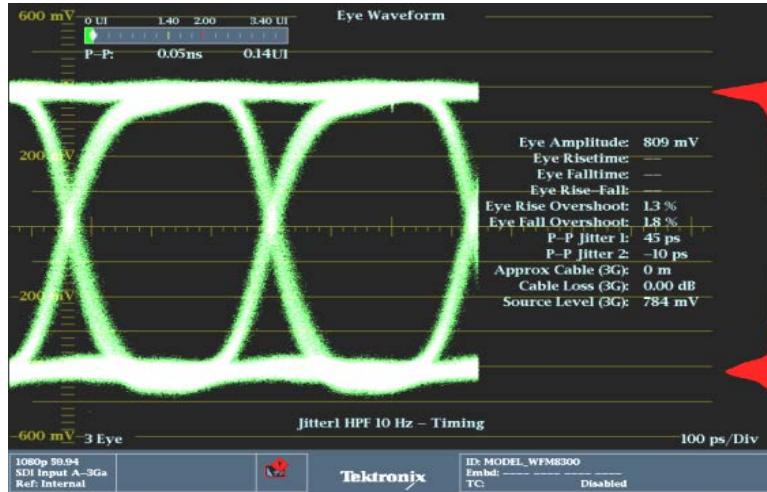
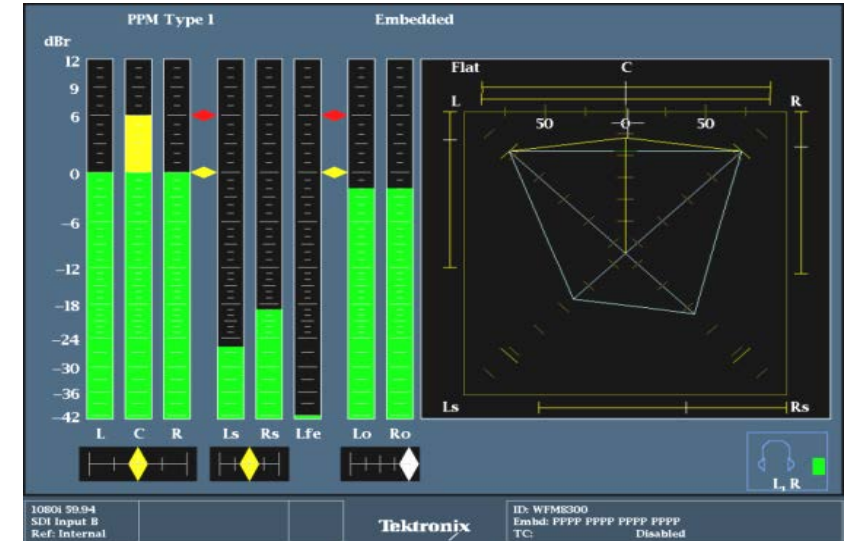3 Gb/s Physical Layer Measurements
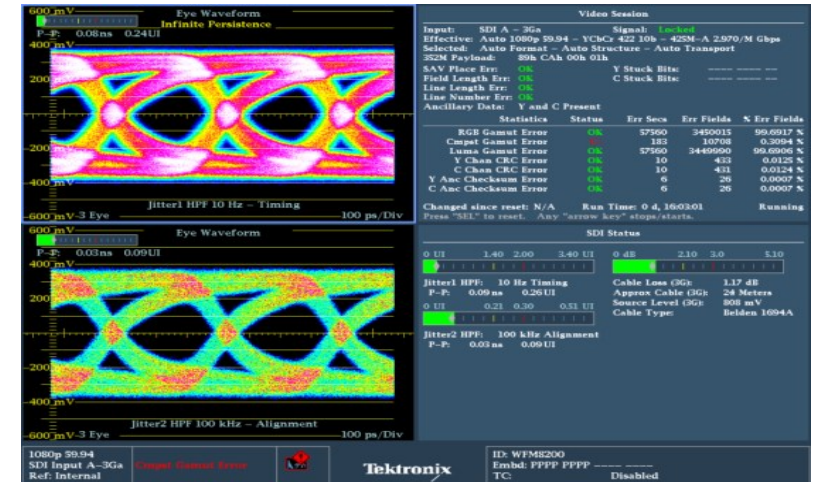
Gamut Monitoring Toolset

Extensive audio monitoring capabilities

Available in all audio options

- Audio Displays
  - Bar Displays
  - Lissajous Display, Surround Display
- Multi-filter Loudness Measurement
  - Compliant with ITU-R BS.1770 and 1771
  - Flat, A-weighted, RL2B (BS.1770)
- Audio Session Display
  - Summary of Mutes, Clips, Silence, Over, Peak Level & Loudness
- Audio Channel Status Display
  - Text, Hex, Binary, XMSN Binary displays
- Audio Control Packet Display

THANK YOU FOR YOUR ATTENTION

21-23 March 2016, New Delhi, India