

FOR

# SPECTRUM MANAGEMENT ECONOMIC ASPECTS

Tehran, Iran (Islamic Rep of)

21-23 November, 2016.



COMMUNICATIONS  
REGULATORY COMMISSION  
OF MONGOLIA



# REGULATORY FRAMEWORKS in ICT sector of Mongolia

Zandraa Amgalan

Director General

Radio frequency regulation and monitoring department

eMail: [amgalan@crc.gov.mn](mailto:amgalan@crc.gov.mn); Web: [www.crc.gov.mn](http://www.crc.gov.mn)

# CONTENT

**1** Country profile

**2** ICT Sector organizational structure and World rank of Mongolia

**3** Statistics of ICT sector of Mongolia

**4** Legal environment and establishment of CRC

**5** Mission and main responsibilities of CRC

**6** Corporate Organizational Chart

**7** National Spectrum Management

**8** Spectrum Pricing Methodology

**9** Spectrum Management Planned Activities

# 1. COUNTRY PROFILE



Territory: 1,564,115.75 km<sup>2</sup>

Climate: 4 Seasons  
extreme continental  
winter ave. -23

Highest peak: 4,267 m  
above the sea

Population:  
3,114,000

Language:  
Mongolian

No. of Provinces:  
21 provinces

Density:  
1.76 per  
km<sup>2</sup>

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

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

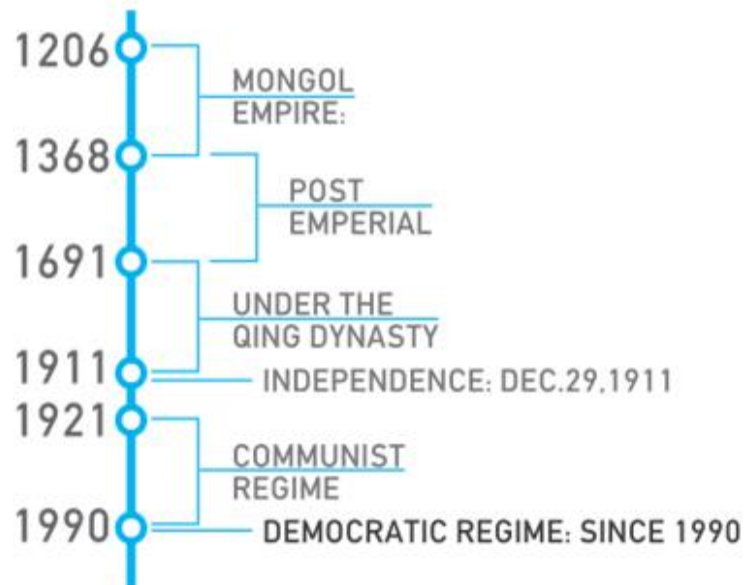
Capital:  
Ulaanbaatar (45%)

- 1 Country profile
- 2 ICT Sector organizational structure and World rank of Mongolia
- 3 Statistics of ICT sector of Mongolia
- 4 Legal environment and establishment of CRC
- 5 Mission and main responsibilities of CRC
- 6 Corporate Organizational Chart
- 7 National Spectrum Management
- 8 Spectrum Pricing Methodology
- 9 Planned Activities

# 1. COUNTRY PROFILE



- 1 Country profile
- 2 ICT Sector organizational structure and World rank of Mongolia
- 3 Statistics of ICT sector of Mongolia
- 4 Legal environment and establishment of CRC
- 5 Mission and main responsibilities of CRC
- 6 Corporate Organizational Chart
- 7 National Spectrum Management
- 8 Spectrum Pricing Methodology
- 9 Planned Activities



## GOVERNMENT AND POLITICS

**GOVERNMENT TYPE:** Parliamentary

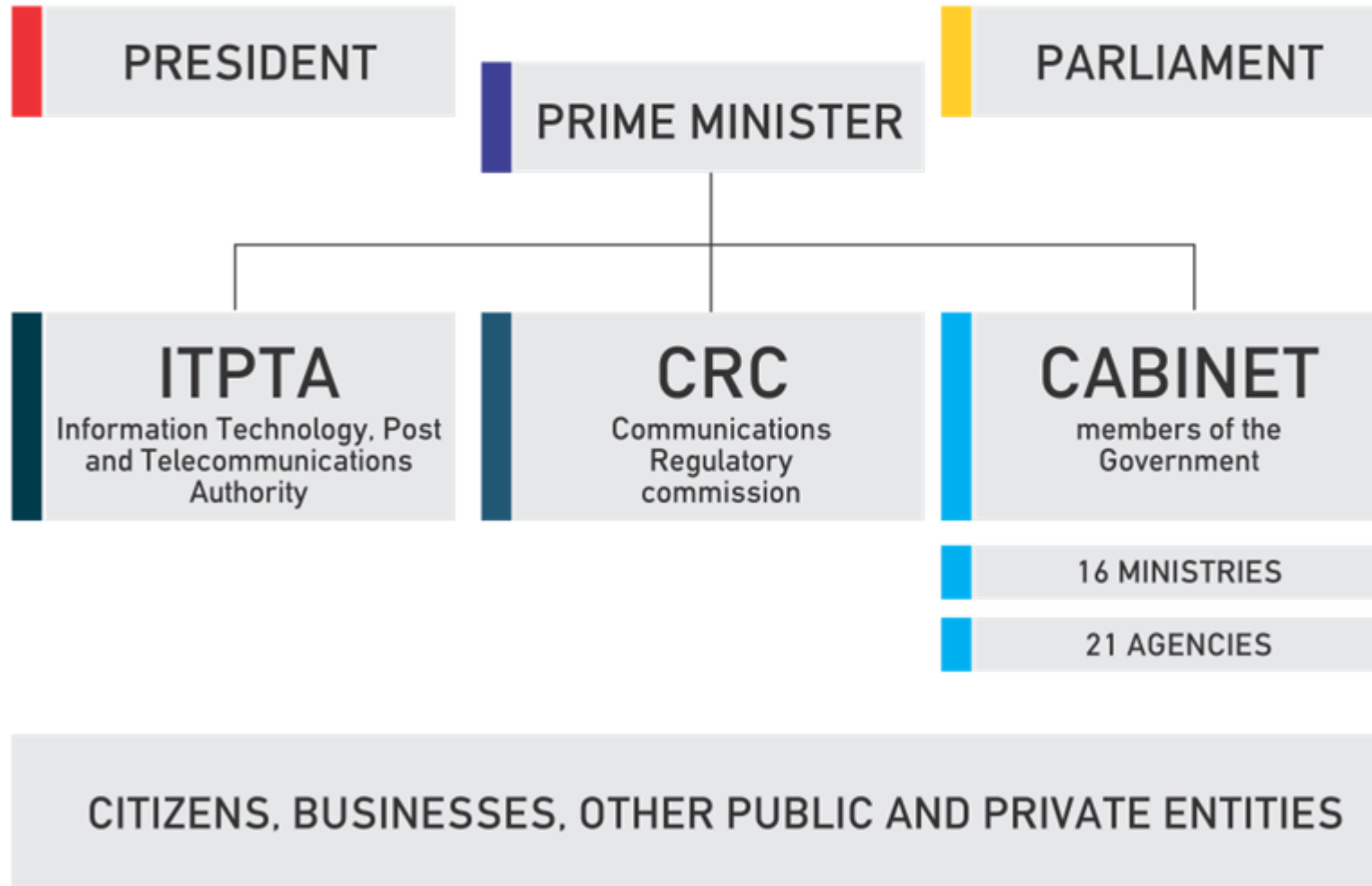
**GOVERNMENT:** 16 ministries  
21 agencies

**GDP TOTAL:** 11.52 billion \$

**ECONOMY:** Agriculture, Mining

**MINERAL RESOURCES:** copper, coal, molybdenum

# 2. ICT SECTOR ORGANIZATIONAL STRUCTURE AND WORLD RANK OF MONGOLIA



- 1 Country profile
- 2 ICT Sector organizational structure and World rank of Mongolia
- 3 Statistics of ICT sector of Mongolia
- 4 Legal environment and establishment of CRC
- 5 Mission and main responsibilities of CRC
- 6 Corporate Organizational Chart
- 7 National Spectrum Management
- 8 Spectrum Pricing Methodology
- 9 Planned Activities

# 2. ICT SECTOR ORGANIZATIONAL STRUCTURE AND WORLD RANK OF MONGOLIA

## ICT Development Index 2015

IDI 2015 Rank	Economy	IDI 2015 Value	IDI 2010 Rank	IDI 2010 Value
80	Dominica	5.12	66	4.56
81	Maldives	5.08	82	3.92
82	China	5.05	87	3.69
83	Grenada	5.05	64	4.67
<b>84</b>	<b>Mongolia</b>	<b>5.00</b>	<b>97</b>	<b>3.52</b>
85	Suriname	4.99	10	3.39
86	St. Lucia	4.98	70	4.39
87	Seychelles	4.96	81	3.98
88	South Africa	4.90	88	3.65
89	Panama	4.87	79	4.07
90	Ecuador	4.81	90	3.65

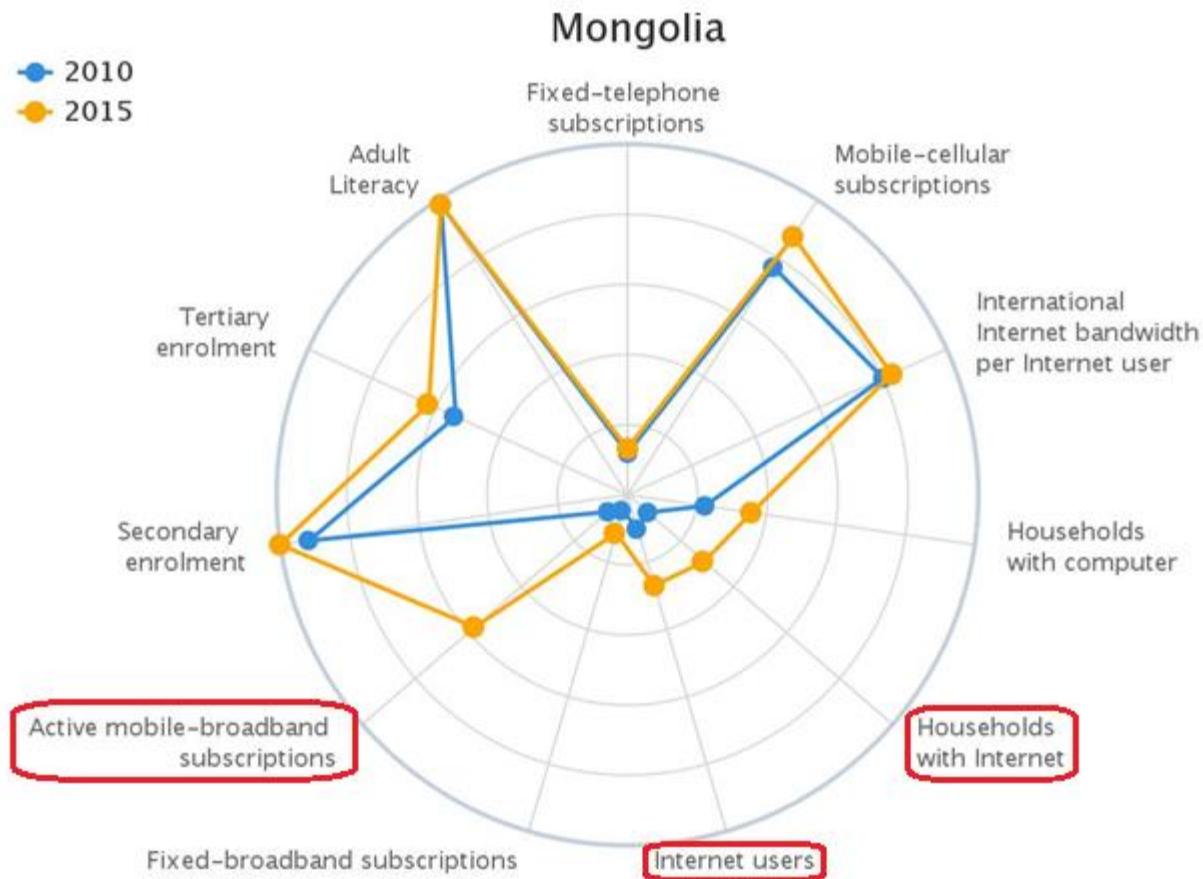
## IDI 2015 Regional Rank: Asia & Pacific

IDI 2015 Rank	Economy	IDI 2015 Value	IDI 2010 Rank	IDI 2010 Value
3	11 Japan	8.47	9	7.73
4	13 Australia	8.29	15	7.32
5	16 New Zealand	8.14	19	7.17
6	19 Singapore	8.08	11	7.62
7	24 Macao, China	7.73	14	7.38
8	64 Malaysia	5.90	61	4.85
9	71 Brunei Darussalam	5.53	53	5.05
10	74 Thailand	5.36	92	3.62
11	81 Maldives	5.08	82	3.92
12	82 China	5.05	87	3.69
<b>13</b>	<b>84 Mongolia</b>	<b>5.00</b>	<b>97</b>	<b>3.52</b>



- 1 Country profile
- 2 ICT Sector organizational structure and World rank of Mongolia
- 3 Statistics of ICT sector of Mongolia
- 4 Legal environment and establishment of CRC
- 5 Mission and main responsibilities of CRC
- 6 Corporate Organizational Chart
- 7 National Spectrum Management
- 8 Spectrum Pricing Methodology
- 9 Planned Activities

# 2. ICT SECTOR ORGANIZATIONAL STRUCTURE AND WORLD RANK OF MONGOLIA



- 1 Country profile
- 2 ICT Sector organizational structure and World rank of Mongolia
- 3 Statistics of ICT sector of Mongolia
- 4 Legal environment and establishment of CRC
- 5 Mission and main responsibilities of CRC
- 6 Corporate Organizational Chart
- 7 National Spectrum Management
- 8 Spectrum Pricing Methodology
- 9 Planned Activities

# 3. STATISTICS OF ICT SECTOR OF MONGOLIA



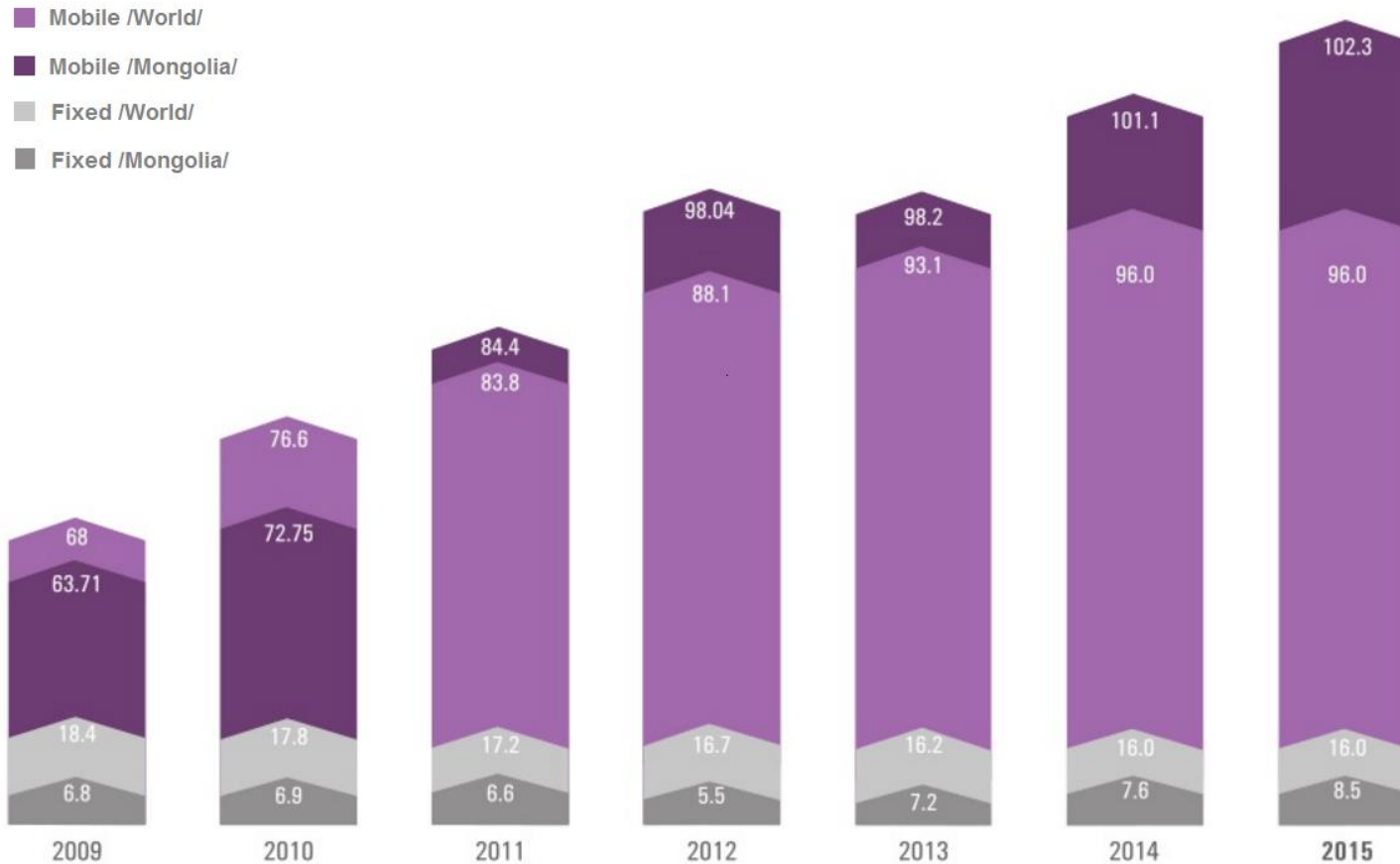
Name	2012 year	2013 year	2014 year	2015 year
Mobicom corporation LLC	46.03%	46.25%	40.03%	41.81%
Skytel LLC	15.84%	16.60%	15.98%	14.99%
Unitel LLC	29.01%	29.48%	32.37%	30.87%
G-Mobile LLC	9.12%	7.67%	11.62%	12.33%
<b>Total</b>	100.00%	100.00%	100.00%	100.00%

- 1 Country profile
- 2 ICT Sector organizational structure and World rank of Mongolia
- 3 Statistics of ICT sector of Mongolia
- 4 Legal environment and establishment of CRC
- 5 Mission and main responsibilities of CRC
- 6 Corporate Organizational Chart
- 7 National Spectrum Management
- 8 Spectrum Pricing Methodology
- 9 Planned Activities



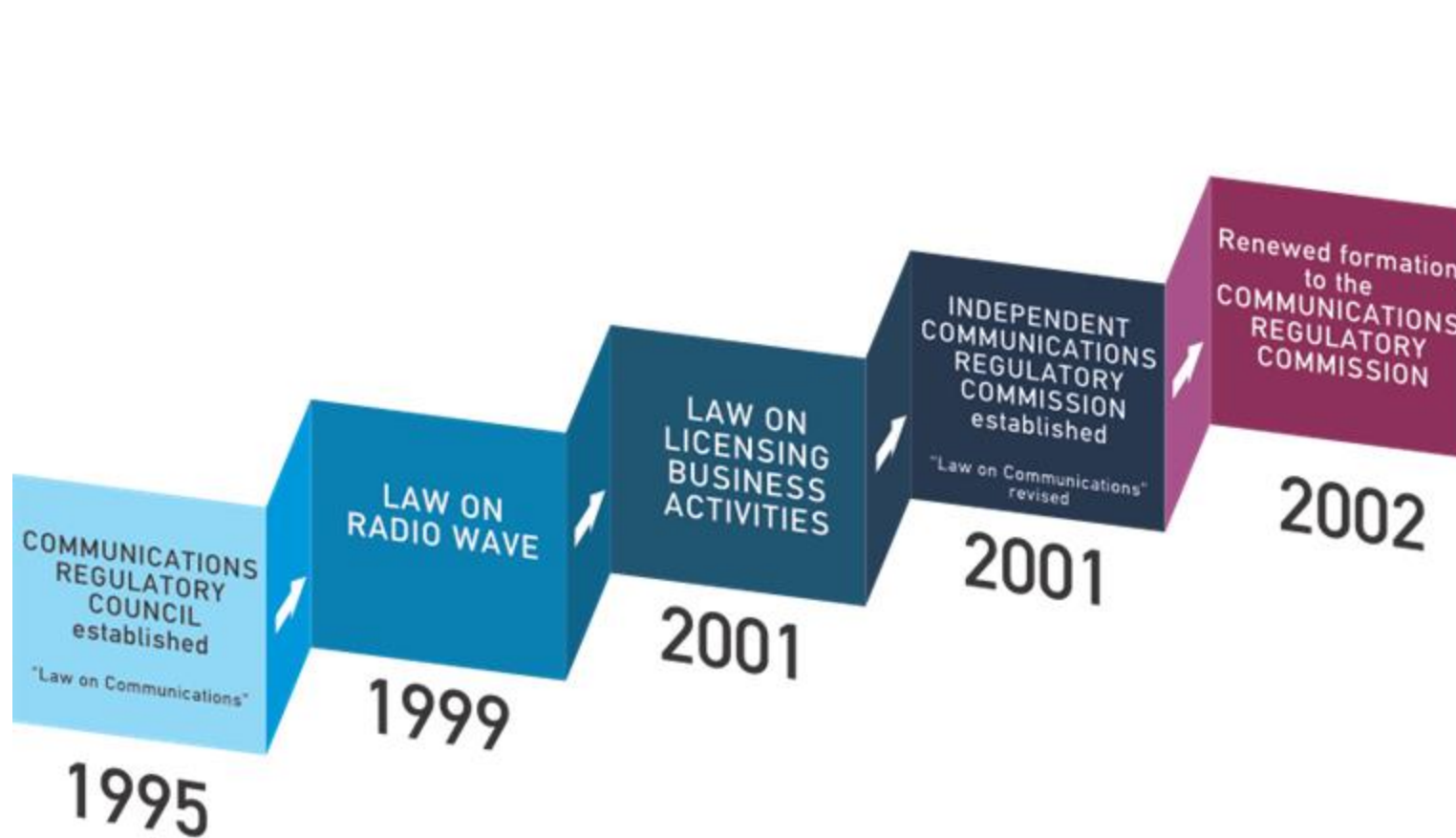
# 3. STATISTICS OF ICT SECTOR OF MONGOLIA

## Mobile penetration in Mongolia 2009-2015



- 1 Country profile
- 2 ICT Sector organizational structure and World rank of Mongolia
- 3 Statistics of ICT sector of Mongolia
- 4 Legal environment and establishment of CRC
- 5 Mission and main responsibilities of CRC
- 6 Corporate Organizational Chart
- 7 National Spectrum Management
- 8 Spectrum Pricing Methodology
- 9 Planned Activities

# 4. LEGAL ENVIRONMENT AND ESTABLISHMENT OF CRC



- 1 Country profile
- 2 ICT Sector organizational structure and World rank of Mongolia
- 3 Statistics of ICT sector of Mongolia
- 4 Legal environment and establishment of CRC
- 5 Mission and main responsibilities of CRC
- 6 Corporate Organizational Chart
- 7 National Spectrum Management
- 8 Spectrum Pricing Methodology
- 9 Planned Activities

# 5. MISSION & MAIN RESPONSIBILITIES OF CRC

## CRC REGULATES

/Law on Licensing Entities/

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

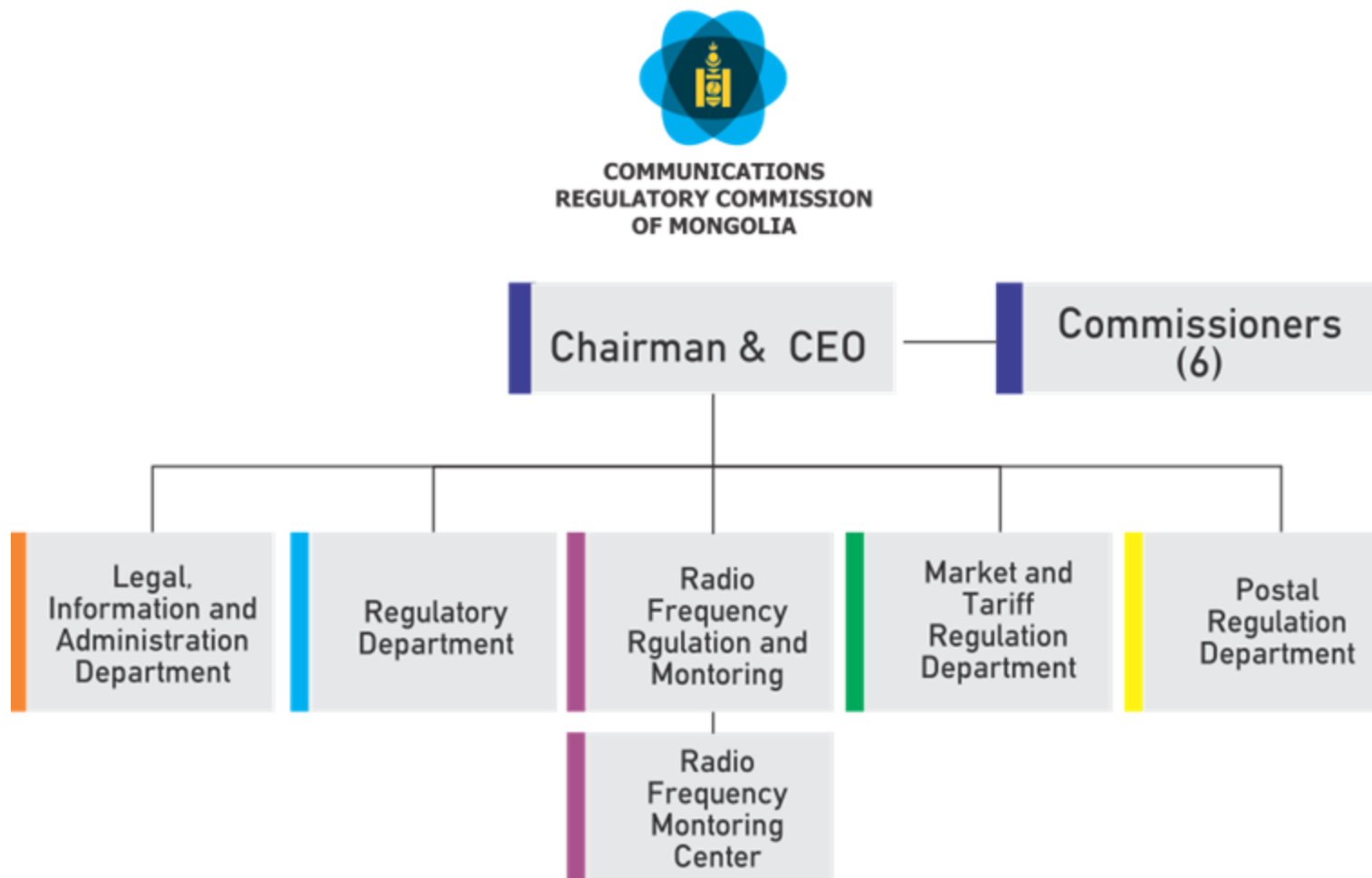
## AUTHORITY OF CRC

/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

- 1 Country profile
- 2 ICT Sector organizational structure and World rank of Mongolia
- 3 Statistics of ICT sector of Mongolia
- 4 Legal environment and establishment of CRC
- 5 Mission and main responsibilities of CRC
- 6 Corporate Organizational Chart
- 7 National Spectrum Management
- 8 Spectrum Pricing Methodology
- 9 Planned Activities

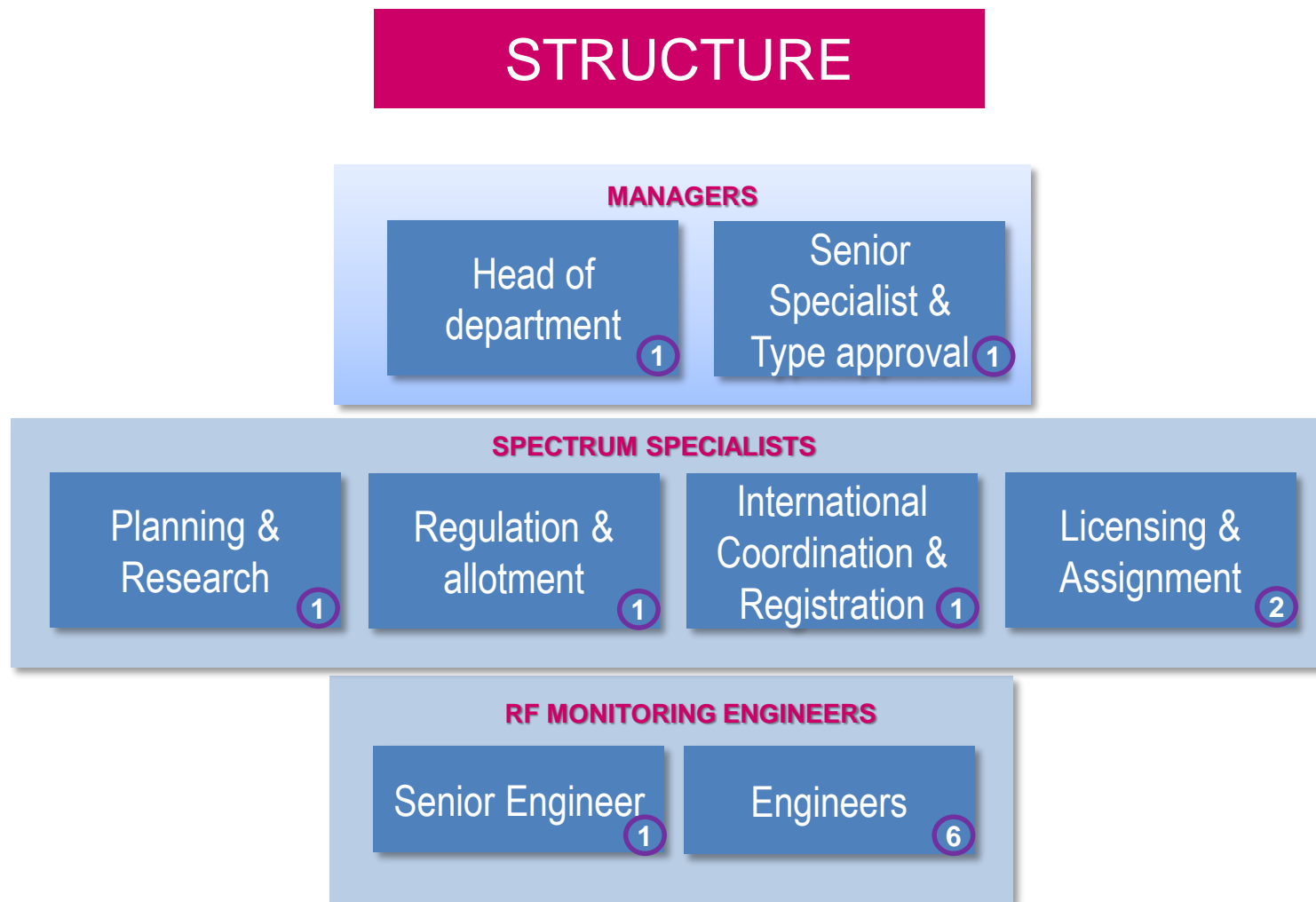
# 6. CORPORATE ORGANIZATIONAL CHART



- 1 Country profile
- 2 ICT Sector organizational structure and World rank of Mongolia
- 3 Statistics of ICT sector of Mongolia
- 4 Legal environment and establishment of CRC
- 5 Mission and main responsibilities of CRC
- 6 Corporate Organizational Chart**
- 7 National Spectrum Management
- 8 Spectrum Pricing Methodology
- 9 Planned Activities

# 7. NATIONAL SPECTRUM MANAGEMENT

## STRUCTURE



Total- 14

- 1 Country profile
- 2 ICT Sector organizational structure and World rank of Mongolia
- 3 Statistics of ICT sector of Mongolia
- 4 Legal environment and establishment of CRC
- 5 Mission and main responsibilities of CRC
- 6 Organizational chart (incl. RF Monitoring Center)
- 7 National Spectrum Management
- 8 Spectrum Pricing Methodology
- 9 Planned Activities

# 7. NATIONAL SPECTRUM MANAGEMENT

## GOALS

- ❑ **Optimizing** the usage of the radio frequency spectrum in accordance with the international standards.
- ❑ **Planning** the assignment of the radio frequency spectrum complying with international rules and international security.
- ❑ **Evacuating** radio frequency spectrum for introducing new services.
- ❑ **Managing** utilization of unused spectrum.
- ❑ **Monitoring** the usage of the radio frequency spectrum.
- ❑ **International Coordination** with neighbor countries for the utilization of the radio frequency spectrum.

- 1 Country profile
- 2 ICT Sector organizational structure and World rank of Mongolia
- 3 Statistics of ICT sector of Mongolia
- 4 Legal environment and establishment of CRC
- 5 Mission and main responsibilities of CRC
- 6 Organizational chart (incl. RF Monitoring Center)
- 7 National Spectrum Management
- 8 Spectrum Pricing Methodology
- 9 Planned Activities

# 7. NATIONAL SPECTRUM MANAGEMENT

## FUNCTIONS

- International frequency Coordination and Registration.
- Frequency planning and Assignment.
- Spectrum monitoring and Inspection.
- Standards Specification & Equipment Type Approval

## ACTIVITIES

- Facilitating frequency assignment in shared bands through coordination.
- Determining the impact of introducing communications equipment into the existing environment.
- Developing the economic and legal environment for licensing procedures.
- Implementing field-monitoring programs to identify interference sources and validate approved spectrum use.
- Technical inspection and Interference complains.

- 1 Country profile
- 2 ICT Sector organizational structure and World rank of Mongolia
- 3 Statistics of ICT sector of Mongolia
- 4 Legal environment and establishment of CRC
- 5 Mission and main responsibilities of CRC
- 6 Organizational chart (incl. RF Monitoring Center)
- 7 National Spectrum Management
- 8 Spectrum Pricing Methodology
- 9 Planned Activities

# 8. NATIONAL SPECTRUM PRICING METHODOLOGY

*Approved by Infrastructure  
Minister's decree no.216 in 2003*

**- Issue RF licenses base on a first-come-first-serve and beauty contest.**

## **Spectrum usage fee for Radio Frequency Special License.**

*(License for service provider. e.g. TV, FM, Cellular... )*

$$U_f = (0.2 * (F + P + C)) + (F + P + C);$$

## **Spectrum usage fee for Radio Frequency Certificate.**

*(Certificate for individual, entities. e.g. walkie talkie, radio link, ... )*

$$U_f = F + P + C;$$

## **Spectrum usage fee for Temporary Certificate. (Up to 3 months only)**

$$U_f = 0.25 * (F + P + C) * 0.2 + (F + P + C) * 0.25;$$

*Whereas:*

*$U_f$  – Spectrum price;*

*$F$  – Radio frequency fee;*

*$P$  – Station's power fee;*

*$C$  – Fee for class, quantity and coverage;*

*0.2, 0.25 – Multiplying coefficient;*

- 1 Country profile
- 2 ICT Sector organizational structure and World rank of Mongolia
- 3 Statistics of ICT sector of Mongolia
- 4 Legal environment and establishment of CRC
- 5 Mission and main responsibilities of CRC
- 6 Corporate Organizational Chart
- 7 National Spectrum Management
- 8 Spectrum Pricing Methodology
- 9 Planned Activities



# 8. NATIONAL SPECTRUM PRICING METHODOLOGY

## Radio frequency fee-F

Band Name	Frequency band	Bandwidth fee for Land Mobile Station (₮)			
		< 12 kHz	12-36 kHz	36-100 kHz	for each 100 kHz when 100<
Very Low (VLF)	Up to 30 kHz	15000	30000	40000	30000
Low (LF)	30-300 kHz	15000	30000	40000	30000
Medium (MF)	300-3000 kHz	15000	30000	40000	30000
High (HF)	3-30 MHz	12000	24000	30000	24000
Very High(VHF)	30-300 MHz	35 000	45 000	50 000	30 000
Ultra High I (UHF I)	300-1000 MHz	35 000	45 000	50 000	30 000
...	.....	...	...	...	...

## Output power fee (VHF, UHF)- P

Output Power	Fee ₮
<100 mW	10000
100- 500 mW	12000
500mW -1W	15000
1- 5 W	20000
5-10 W	30000
10-25 W	40000
25-50 W	50000
.....	.....

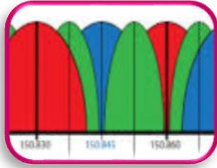
## Class and coverage fee-C

Geographical location	Coverage fee (₮)	
	TV	FM
City	1,500,000	500,000
Province	200,000	150,000
Village	50,000	20,000

- 1 Country profile
- 2 ICT Sector organizational structure and World rank of Mongolia
- 3 Statistics of ICT sector of Mongolia
- 4 Legal environment and establishment of CRC
- 5 Mission and main responsibilities of CRC
- 6 Corporate Organizational Chart
- 7 National Spectrum Management
- 8 Spectrum Pricing Methodology
- 9 Planned Activities

# 9. NATIONAL SPECTRUM MANAGEMENT

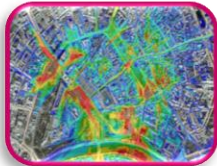
## PLANNED ACTIVITIES



Evacuate the radio frequency spectrum for new services; *e.g. 4G, DAB, Digital MMDS.*



Establish new spectrum pricing regime.



Study intersystem interference analysis tools and permissible interference criteria.



Extend the monitoring of frequency spectrum coverage by means of transportable equipment.



Establish test labs for wireless sets.

- 1 Country profile
- 2 ICT Sector organizational structure and World rank of Mongolia
- 3 Statistics of ICT sector of Mongolia
- 4 Legal environment and establishment of CRC
- 5 Mission and main responsibilities of CRC
- 6 Corporate Organizational Chart
- 7 National Spectrum Management
- 8 Spectrum Pricing Methodology
- 9 Planned Activities



**COMMUNICATIONS  
REGULATORY COMMISSION  
OF MONGOLIA**

**THANK YOU FOR YOUR  
ATTENTION**