



CCT/14-51

# COOMET activity in the field of thermometry

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*COOMET TC 1.10*



Germany



Cuba



Bulgaria



Bosnia and Herzegovina



Belarusia



Azerbaijan



Georgia



DPR of Korea



Armenia

# COOMET



Kazakhstan



Kyrgyzia



Lithuania



Uzbekistan



Moldova



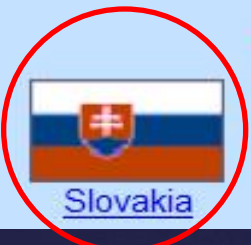
Ukraine



Romania



Russia



Slovakia



Tajikistan

# **The Technical Committee COOMET TC1.10**

The technical committee TC1.10 coordinates activity of COOMET metrological institutes in the field of Thermometry and Thermal Physics

The technical committee COOMET TC1.10 was created in 2001. The first meeting of COOMET TC1.10 took place in October, 2001. Specialists of national metrological institutes of Russia, Ukraine, Germany and Slovakia took part in meeting.

Now national metrological institutes of 13 countries participate in work of COOMET TC1.10

# The main activities of the Technical Committee COOMET TC1.10

- 1 . Involvement of COOMET NMIs in process of implementation of MRA.
2. The organization and carrying out key comparisons for an assessment of equivalence of national standards and support of measuring capabilities of COOMET NMIs.
3. Achievement of the international recognition of measuring capabilities of NMIs of the COOMET participants.
4. CMCs reviewing.
5. Development of recommendations concerning calibration of devices for temperature measurement.

# Involvement of COOMET NMIs in process of implementation of MRA



Ukraine



Russia



Germany



Slovakia

# COOMET

## TC1.10 projects participants 2001

(4)

# Involvement of COOMET NMIs in process of implementation of MRA



Ukraine



Belarusia



Russia



Germany



Slovakia

# COOMET

## TC1.10 projects participants 2003

(5)

# Involvement of COOMET NMIs in process of implementation of MRA



Russia



Ukraine



Belarusia



Moldova



Kazakhstan



Germany



Slovakia

**TC1.10 projects  
participants 2006**

(7)

# Involvement of COOMET NMIs in process of implementation of MRA



## TC1.10 projects participants 2009

(9)



# Involvement of COOMET NMIs in process of implementation of MRA



Ukraine



Belarusia



Moldova



Kazakhstan



Russia



Germany



Slovakia



Cuba



Kyrgyzia



Azerbaijan



Georgia

## TC1.10 projects participants 2012

(11)

# Involvement of COOMET NMIs in process of implementation of MRA



Russia



Ukraine



Belarusia



Moldova



Kazakhstan



Germany

# COOMET



Kyrgyzia



Slovakia

# TC1.10 projects participants 2013

(12)



Azerbaijan



Cuba



Uzbekistan



Georgia

# Involvement of COOMET NMIs in process of implementation of MRA



Russia



Ukraine



Belarusia



Moldova



Kazakhstan



Germany



Slovakia



Cuba



Bosnia and Herzegovina



Uzbekistan



Georgia



Kyrgyzia



Azerbaijan

# COOMET

## TC1.10 projects participants 2014 (13)

# Involvement of COOMET NMIs in process of implementation of MRA

No	Country	NMIs	Yes/No
1	<b>Armenia.</b>	National Institute of Metrology	<b>No</b>
2	<b>Azerbaijan</b>	State Committee for Standardization, Metrology and Patents of the Republic of Azerbaijan	<b>Yes</b>
3	<b>Belarus</b>	Belarussian State Institute of Metrology	<b>Yes</b>
4	<b>Bosnia and Herzegovina</b>	Institute of Metrology of Bosnia and Herzegovina	<b>Yes</b>
5	<b>Bulgaria</b>	Bulgarian Institute of Metrology	<b>Yes*</b>
6	<b>Cuba</b>	National Research Institute on Metrolog	<b>Yes</b>
7	<b>Germany</b>	Physikalisch-Technische Bundesanstalt (PTB).	<b>Yes</b>
8	<b>Georgia</b>	Georgian National Agency for Standards, Technical Regulations and Metrology	<b>Yes</b>
9	<b>DPR Korea</b>	Central Institute of Metrology (CIM).	<b>No</b>
10	<b>Kazakhstan</b>	Kazakhstan Institute of Metrology” ( “KazInMetr”	<b>Yes</b>
11	<b>Kyrgyzstan</b>	Centre for Standardization and Metrology	<b>Yes</b>
12	<b>Lithuania</b>	National Metrology Institute	<b>Yes*</b>
13	<b>Moldova</b>	National Institute of Metrology	<b>Yes</b>
14	<b>Romania</b>	National Institute of Metrology (INM)	<b>Yes*</b>
15	<b>Russia</b>	All-Russian Scientific Research Institute of Metrology named after D.I. Mendeleev (VNIIM); National Research Institute of Physicotechnical and Radio Engineering Measurements (VNIIFTRI)	<b>Yes</b>
16	<b>Slovakia</b>	Slovak Institute of Metrology (SMU)	<b>Yes</b>
17	<b>Tajikistan</b>	Agency on Standardization, Metrology, Certification and Trade Inspection	<b>No</b>
18	<b>Ukraine</b>	National Scientific Centre “Institute of Metrology” (NSC “IM”)	<b>Yes</b>
19	<b>Uzbekistan</b>	State Institution “Centre of National Standards of Republic Uzbekistan”	<b>Yes</b>

## 2.The organization and carrying out comparisons (Some difficulties)

1. Many national institutes of COOMET are created on the basis of calibration laboratories therefore they have no devices necessary for completion of standards and insufficient qualification of experts.

2 Russia the only COOMET country, institute of which is participant of CCT. Therefore, only this institute may organize regional key comparisons in COOMET. The making or perfecting of the national standards and professional development of experts needs a lot of time. This time is individual for each NMI. Therefore VNIIM is compelled to repeat several times the same comparisons to give chance of COOMET NMIs, to estimate equivalence of the created standards

3. Many NMIs are located at a great distance from pilot laboratory that is the reason of impossibility of participation in comparisons. (For example Cuba)

## 2. The organization and carrying out comparisons

### (2.1 Reported COOMET key comparisons)

**1. COOMET.T-K3** Realizations of the ITS-90 from 302.9 K to 692.7 K (2005 – 2007)

**Participating institutes:** VNIIM (Russia), BelGIM (Belarus), SMU (Slovakia)

**2. COOMET.T-K3.1** Realizations of the ITS-90 from 302.9 K to 692.7 K (2008 – 2009)

**Participating institutes:** VNIIM (Russia), NSC IM (Ukraine)

**3. COOMET.T-K3.2** Realizations of the ITS-90 from 302.9 K to 692.7 K (2010 – 2012)

**Participating institutes:** VNIIM (Russia), GEOSTM (Georgia), INSM (Moldova)

**4. COOMET.T-K7** Comparison of water triple point cells (2008 – 2011)

**Participating institutes:** VNIIM (Russia), BelGIM (Belarus), NSC IM (Ukraine), GEOSTM (Georgia), INSM (Moldova), INIMET (Cuba), KazInMetr (Kazakhstan),

## 2. The organization and carrying out comparisons

### (2.2 Key and supplementary comparisons in progress)

1. **COOMET.T-K5** Realizations of the ITS-90 at 1084.62 °C  
(2014 – 2015)

**Participating institutes:** VNIIM (Russia), NSC IM (Ukraine),

2. **COOMET.T-K3.3** Realizations of the ITS-90 from 273.16 K to 933.47 K  
(2014 – 2015)

**Participating institutes:** VNIIM (Russian Federation), BelGIM (Belarus), KazInMetr (Kazakhstan), NSC IM (Ukraine), GEOSTM (Georgia)

3. **COOMET.T-S1** Comparison of type S thermocouples . (2014 – 2015)

**Participating institutes:** VNIIM (Russia), KazInMetr (Kazakhstan), NSC IM (Ukraine).

4. **COOMET 544/RU-a/11** “Regional Key Comparison Humidity Standards of Gases. Dew/frost Point Temperature from - 50 °C to +20 °C”

**Participating institutes:** VNIIFTRI (Russia), BelGIM (Belarus), KazInMetr (Kazakhstan), NSC IM (Ukraine), INM (Romania), BIM (Bulgaria), NISM (Moldova)

## 2.The organization and carrying out comparisons

### (2.3 Reported pilot comparisons of COOMET)

1. COOMET 495/RU-a/10 «Measurement of thermal conductivity in the range from 0,03 to 0,05 W / (m·K) in the temperature range from 10 °C to 40 °C» (2010 – 2011).

**Participating institutes:** VNIIM (Russia), KazInMetr (Kazakhstan)

2. COOMET 549/RU-a/12 «Measurement of thermal conductivity in the range from 0,03 to 0,2 W / (m·K) in the temperature range from 10 °C to 40 °C» (2012 – 2013).

**Participating institutes:** VNIIM (Russia), BelGIM (Belarus), KazInMetr (Kazakhstan)



## 2.The organization and carrying out comparisons

### (2.4 Reported pilot comparisons of COOMET)

3. COOMET 228/UA-a/01 "Comparisons of national standards of the unit of the energy of combustion using the benzoic acid " (2001-2010).

**Participating institutes:** VNIIM (Russia), NSC "IM" (Ukraine), NIM (Chine), INM (Romania)

4. COOMET 489/RU-a/10 "Regional comparisons of national standards of the unit of the energy of combustion using the high-purity graphite" (2010-2013).

**Participating institutes:** VNIIM (Russia), NSC "IM" (Ukraine), NIM (Chine), BelGIM (Belarus).

## 2.The organization and carrying out comparisons

(2.5 COOMET pilot comparisons in progress)

1. COOMET 488/RU-a/10 “Comparisons of standard methods of measuring of the heat of combustion of natural gas” (2010-2014 ).

**Participating institutes:** VNIIM (Russia), BelGIM (Belarus), NSC “IM” (Ukraine).

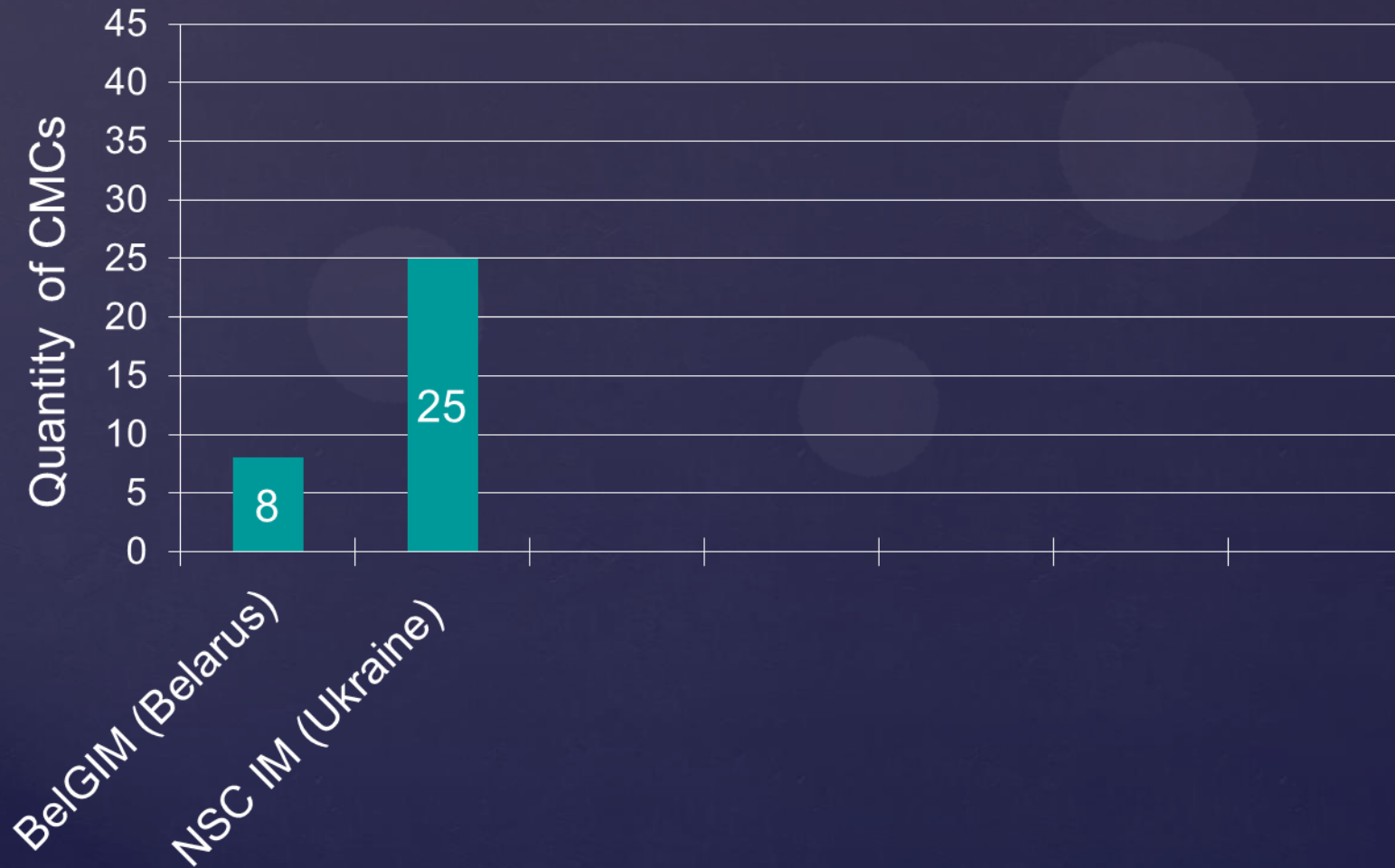
2. COOMET 623/Ru-a/13 “Comparisons of national standards of the unit of the energy of combustion using the solid and liquid fuels”

(2013-2015).

**Participating institutes:** VNIIM (Russia), BelGIM (Belarus).



### 3. Dynamics of development of measuring capabilities of COOMET NMIs 2010

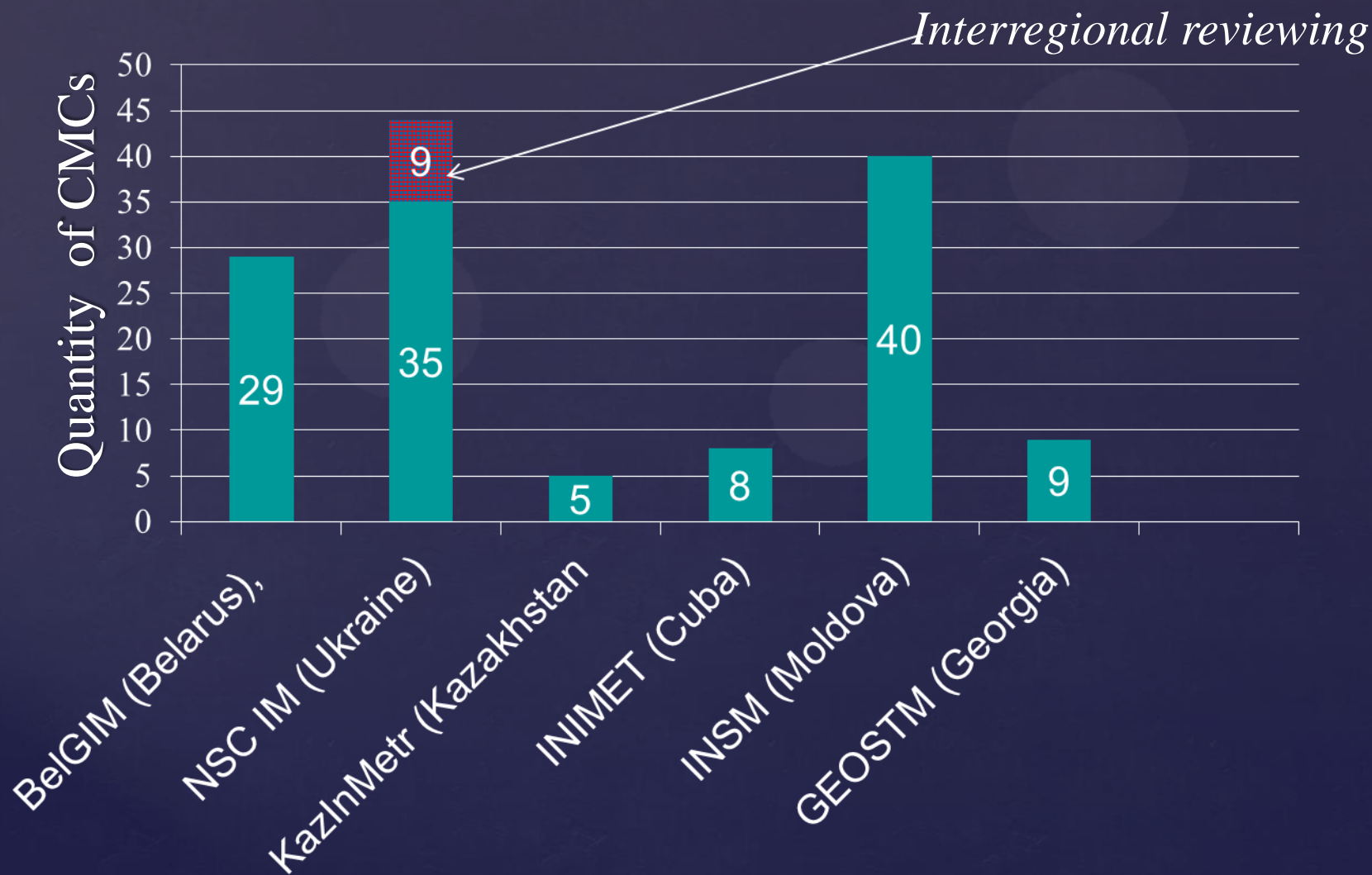


### 3. Dynamics of development of measuring capabilities of COOMET NMIs

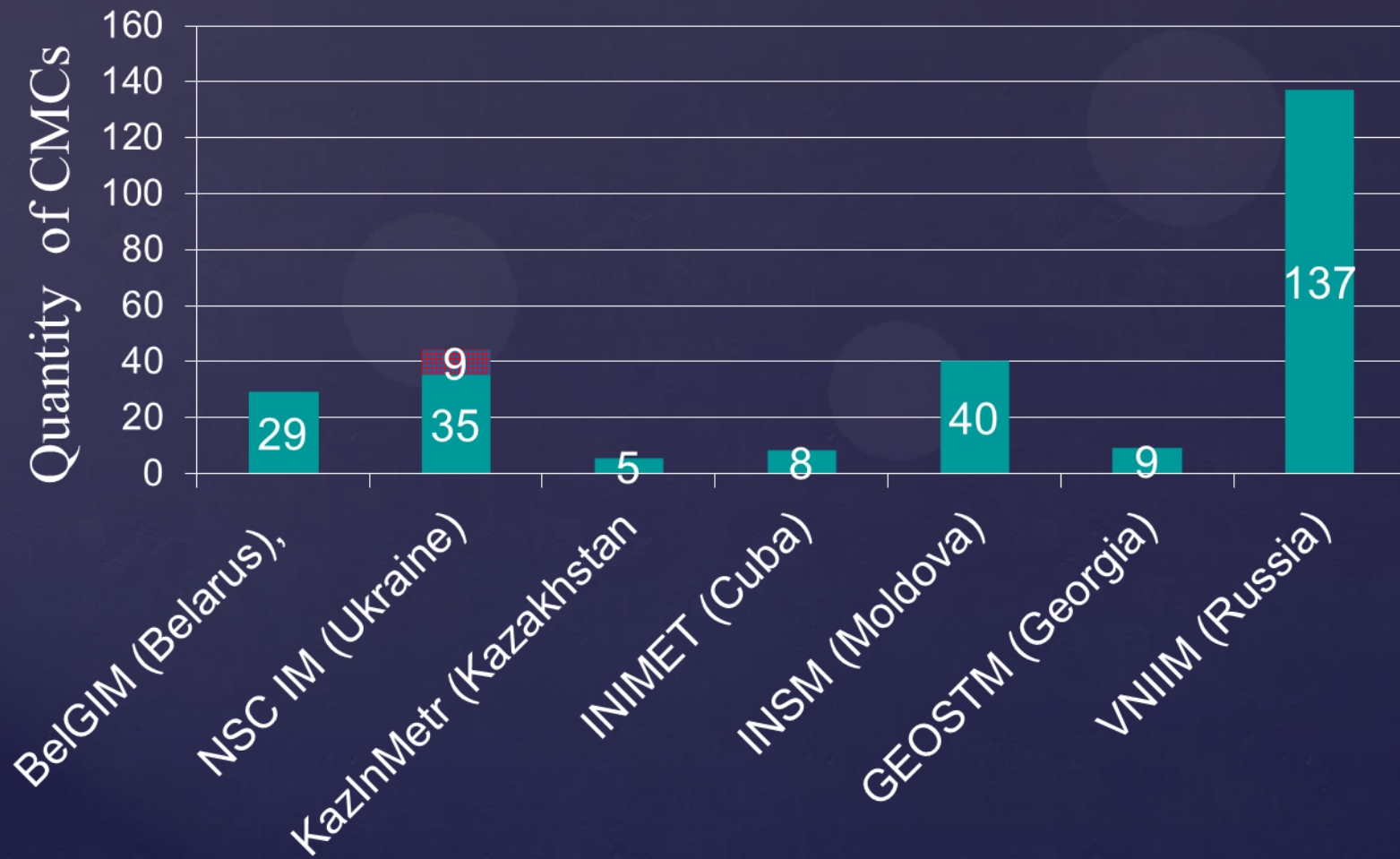
#### 2013



### 3. Dynamics of development of measuring capabilities of COOMET NMIs 2014



### 3. Dynamics of development of measuring capabilities of COOMET NMIs 2014



## 4. Organization of the reviewing of measuring and calibration capabilities

The reviewing procedure of measuring and calibration capabilities of the COOMET national metrological institutes and interregional reviewing of institutes of other regional metrological organizations it is regulated by:

- 1) WG8 Review Protocols;
- 2) The document COOMET R/GM/7:2006." KOOMET SMS reviewing".



# COOMET group of experts in the field of thermometry and measurements of thermophysics quantities

Metrology area:	Thermometry and thermophysics		
Subarea	Information on technical experts		
1	Surname and name of the expert	NMIs	Country
Humidity	Vinge A.F.	VNIIFTRI	Russia
Humidity	Khairova N.V.	BelGIM	Belarus
Humidity	Savina T.I.	CSM	Kyrgyz Republic
Humidity	Melnikov A.A.	UkrMetrTest	Ukraine
Humidity	Bordianu K.	INSM	Moldova
Humidity	Muchamedzhanov B.	KazInMetr	Kazakhstan
Thermometry	Dikun T.I.	BelGIM	Belarus
Thermometry	Denisova M.G.	CSM	Kyrgyz Republic
Thermometry	Ivanova E.P.	NSC IM	Ukraine
Thermometry	Ivanova A.G.	VNIIM	Russia
Thermometry	Bordianu K.	INSM	Moldova
Thermometry	Muchamedzhanov B.	KazInMetr	Kazakhstan

## **5. The new COOMET projects for MRA support**

1. COOMET 594/RU/13 “The training workshop “Calibration of platinum resistance thermometers by the direct comparison method using thermostats”.
2. COOMET 633/KG/14 “Development of COOMET recommendations «Calibration of resistance thermometers by comparison method»”.

**THANK YOU!**