



# Capacity Building

EURAMET General Assembly  
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Background

Evolution

CB under EMPIR

## Capacity building - activities

- Have been identified as necessary already in 2000\*,
- Concrete planning started in 2006\*\* and
- Performance in the EURAMET community started from November 2008, when the Focus Group on Facilitating National metrology Infrastructure Development was established (in BoM, Skopje)

From that time until now capacity building for emerging institutes performed, initiated and coordinated by EURAMET Focus Group.

Financial support came mainly (but not exclusively) from PTB Q5.

\*) High Level Expert Group on Measurements and Testing under the 5th European Framework Programme

\*\*) Round table “Possibilities for regional co-operation between the NMIs in South-Eastern Europe”,  
Bulgarian Institute of Metrology , Sofia, 6/7 November, 2006 (Supported by CARDS

The purpose of EURAMET e.V. is according to the byelaws the promotion of science and research and European cooperation in the field of metrology. Whereas the cooperation in science and research among European NMIs enters a new era through the development and implementation of the EMRP/EMPIR, there are still needs and demands to focus some effort on the cooperation in developing national metrology infrastructures.

development of the metrology infrastructure in the countries

integration of its member NMIs into EURAMET activities

raising awareness about the development in metrology and quality infrastructure

To organize trainings: by organizing trainings the transfer of knowledge and experience will be enhanced and the competences can be more efficiently used and developed through an extensive exchange and benchmarking between experts.

To organize comparisons: NMIs which have not yet participated in comparisons will be enabled to gain experience and know-how on all aspects of the implementation of comparisons. NMIs which have not sufficient comparisons to support their CMCs will be enabled to catch up with their participation in comparisons.

To facilitate collaboration and joint use of facilities: given the small markets in some countries enhanced division of labor and sharing of costs between the NMIs of neighboring countries enables the efficient use of the available resources.

To support networking and awareness

To establish discussion fora and information exchange

To assist NMIs applying for membership of EURAMET

# FG: An overview of performed activities

Trainings and workshops (in addition: intercomparisons)

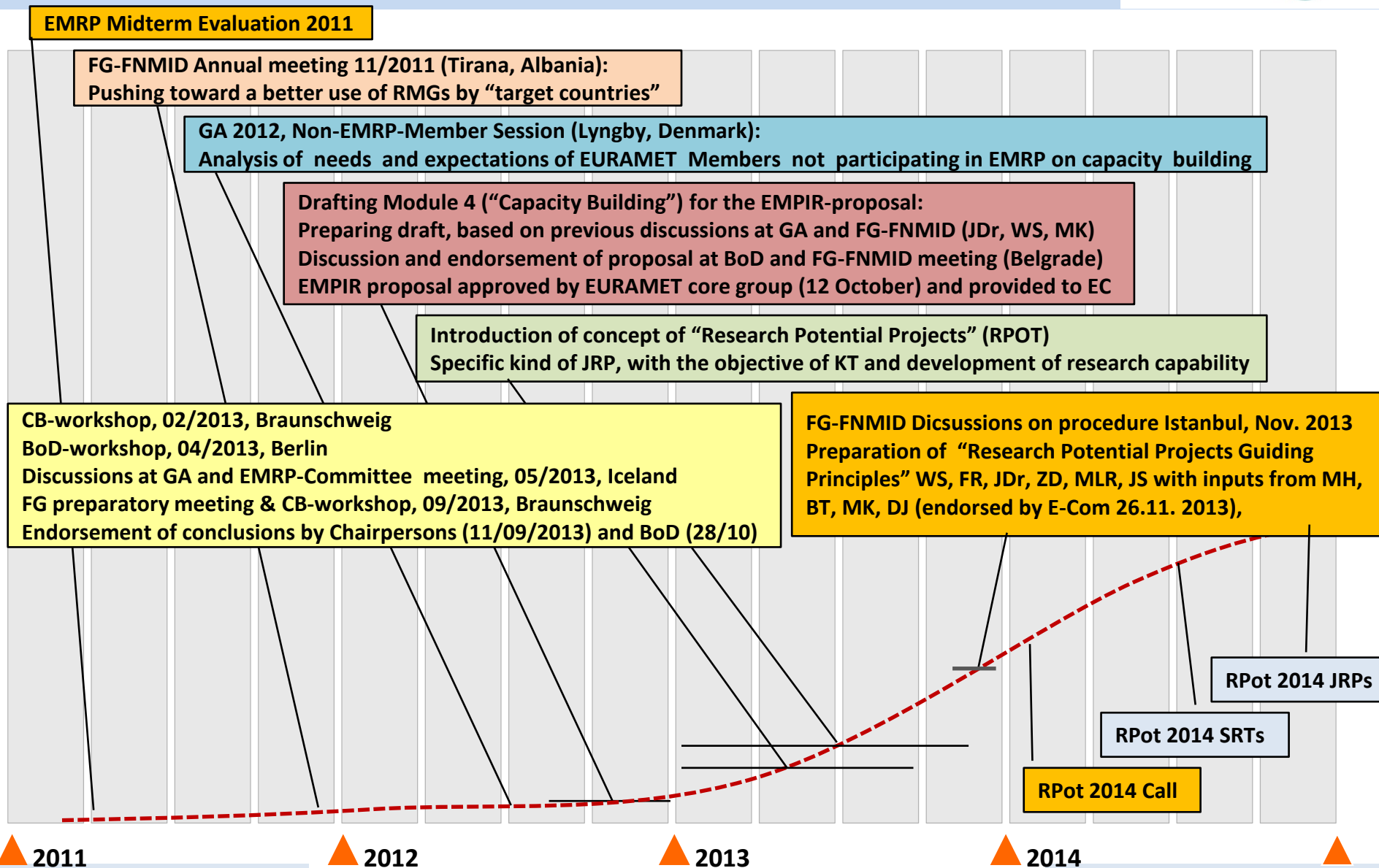
|      | MiC         | IR      | Electrical quantities |      | T & F | Length | Flow | Volume | LM           | Mass & related quantities |        |          |                  | Thermometry |          | QMS | BMP | Meas. Uncert. | CIPM MRA |
|------|-------------|---------|-----------------------|------|-------|--------|------|--------|--------------|---------------------------|--------|----------|------------------|-------------|----------|-----|-----|---------------|----------|
|      |             |         | AC/DC I, R            | DC V |       |        |      |        |              | General                   | Vacuum | Pressure | Calibration NAWI |             | Humid.   |     |     |               |          |
| 2014 | IMBiH       |         | EIM                   |      |       |        |      |        | DZM / IMBiH  |                           |        |          |                  |             |          |     |     |               |          |
| 2013 | DMDM/IMBiH  |         |                       |      |       |        |      |        |              |                           |        |          |                  |             |          |     |     |               | IMBiH    |
| 2012 |             | IRMM/VI |                       |      |       | UME    |      |        |              |                           |        |          |                  | EIM         |          |     |     | IMBiH         | BoM      |
| 2011 |             |         | DMDM                  |      | EIM   |        |      |        |              |                           |        |          |                  |             | MIRS-LMK |     |     |               |          |
| 2010 | IMBiH/CRTHT |         |                       |      |       |        |      |        | DZM / WELMEC |                           |        |          |                  |             |          |     |     | IMBiH, DPM    |          |
| 2009 | DZM / MIRS  |         |                       | EIM  |       |        |      | EIM    | BoM, DZM     |                           | IMBiH  | DZM-FSB  | MIRS             |             | DZM-FSB  | BIM | BIM |               |          |
| 2008 |             |         |                       |      |       |        | UME  | UME    |              | BoM                       |        |          |                  | UME         | UME      |     |     |               |          |
| 2007 |             |         |                       |      |       |        |      |        |              | EIM                       |        |          |                  |             |          |     |     |               |          |

EMRP Midterm Evaluation 2011:

*“EMRP is not having the desired effect in terms of **capacity building** in those countries with limited or no metrology research capability ...”*

This is why lot of efforts have been invested in preparation of the Capacity building module in EMPIR

# Evolution of CB under EMPIR





## **ANNEX I / Objectives of EMPIR**

EMPIR shall pursue the following general objectives:

...

(b) create an integrated European Metrology Research system with critical mass and active engagement at regional, national, European and international level.

.....

## **ANNEX II / Indirect actions supported by EMPIR**

1. EMPIR may support the following indirect actions in the area of joint research and technological development:

1.5. metrology capacity-building activities on different technological levels aiming to achieve a balanced and integrated metrology system in *the participating states*.

## Introduction:

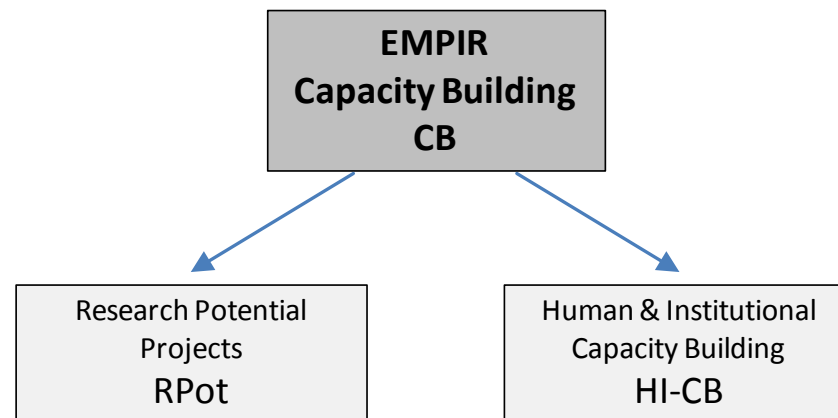
Based on the EMPIR proposal from 12 October 2012, and on discussions carried out at the BoD, the EMRP-Committee and the FG-FNMID since then, **Capacity Building (CB)** in EMPIR comprises:

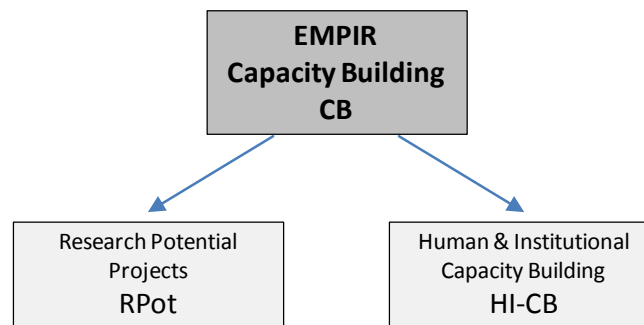
## **Research Potential Projects (RPot):**

JRP-type projects for the development of research capabilities in NMIs and DIs

## **Human & Institutional Capacity Building (HI-CB):**

CB projects and activities for the consolidation of the metrological core competence of NMIs and DIs





## Status:

### RPOT

- concept is developed (in general)
- first RPOT-call in progress (decision on SRTs on 6. June, 2014)

### HI-CB

- proposed to be carried out within EMPIR
- concept has been discussed at FG-FNMID, BoD, EMPIR-Com
- first activities envisaged to start mid 2015
- decisions on guiding principles by EMPIR-Committee needed
- development of rules based on these decisions required

CB instrument for the development of the potential for metrology research of the participating organisations which will subsequently provide input to other aspects of technology transfer, innovation and all other aspects of research.

- a) **Demand orientation**
- b) **European Dimension: develop metrology potential needed in a European context.**
- c) **EURAMET collaboration: make use of EURAMET internal expertise and infrastructure, to provide**
- d) **Horizontal coordination among emerging EURAMET members with the aim to develop new metrology infrastructure in a coordinated way (“smart specialisation”).**
- e) **Critical mass: project dimension should justify coordination between several NMIs and bring the expertise of the partners together.**
- f) **Impact: significant improvement of measurement capability and quality on a national or European level as a result of the project.**

RPOTs should include some research and development activities and in this respect they differ from the technical assistance nature of cooperation, however they do not need to address fundamental scientific challenges.

An important element of RPOTs is the collaboration between NMIs/DIs that are less experienced in a relevant field with NMIs/DIs with greater experience

## **Some examples to illustrate the nature of activities**

# HI – CB : FG action plan 2014

| action plan Code  | Activity  | Responsibility/ Organisation         | Participants                              | Trainers  | Host/Pilot  | Timeframe   | comment: status 6.3.2014   |
|---|---|--------------------------------------|---|-----------|-------------|---|--|
| <b>1 Institutional Capacity Building</b>  |   |                                      |   |           |             |   |  |
| 1.2   | Training on NMI management issues: Advice / exchange of experience in Strategic Planning  | UME<br>EMSec to prepare a proposal   | PTB<br>Participants: TR, ME, MK           |           | UME         | draft ideas till May, training September, Report on the next FG meeting | presentation of several case studies by NMI directors, ex-NMI directors members of management boards financial management, HR management, strategic planning, projects, internal knowledge dissemination |
| <b>2 Human Resource Capacity Building (Trainings)</b>   |   |                                      |   |           |             |   |  |
| 2.3   | Workshop on DMM comparison  |                                      | AL, BA, MK, MN, ME, (SI)                  | EIM       | EIM, GR     | 7-11 April 2014   | Combined with 2.5 (one working week together), EIM proposes March 2014   |
| 2.5   | Follow-up hand-on training on AC/DC current and resistance  |                                      | ME, RS, BA, MK, KO (SI)                   | EIM       | EIM, GR     | 7-11 April 2014   | Combined with 2.3 (one working week together), EIM proposes March 2014, up to 12 people, It is necessary to confirm the week, EIM to define the program and propose the accomodation                     |
| 2.6   | Follow-up on the project PT in chemistry (precious metals – Au, Ag, Pt) summarizing workshop with evaluation of results and proposals how to proceed in activities related to precious metals |                                      | RS, BA, ME, PL, HR,                       |           | IMBiH, BA   | 18-19 November, 2014  | Katarina Hafner (IMBiH), Jelena Bebić (DMDM), workshop up to 3 days, Šemsa Suljagić contact in IMBiH, other proposed activitis to be considered in Rpot  |
| <b>3 Technical Capacity Development (Comparisons, PTs)</b>  |   |                                      |   |           |             |   |  |
| Five ongoing intercomparisons at different stages   |   |                                      |   |           |             |   |  |
| <b>4 Enabling Environment</b>   |   |                                      |   |           |             |   |  |
| EMSec to review the status, discuss and propose priorities, plan of activities and timeline - ASAP. |   |                                      |   |           |             |   |  |
| <b>5 Legal Metrology (plan 2013)</b>  |   |                                      |   |           |             |   |  |
| 5.3   | <a href="#">Implementation of MID, New Legislative Framework</a>  | WELMEC / IMBiH, BA (O) & DZM, HR (H) | AL, BA, ME, RS, MT, IE, MK, KS (HR), (TR) | F, NL, CZ | DZM, HR (H) | 26 - 27 February 2014   | concluded  |

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Industrial Area of Thessaloniki

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## TRAINING COURSE

### DC & AC CURRENT

### DMM CALIBRATION

Week starting: 07.04.2014

Week ending: 11.04.2014

|         | Monday  | Tuesday                                 | Wednesday  | Thursday  | Friday                         |
|---------|---|---|--|---|--------------------------------|
|         | 07.04.2014  | 08.04.2014                              | 09.04.2014   | 10.04.2014  | 11.04.2014                     |
|         | RESISTANCE DC   | RESISTANCE AC                           | CURRENT DC   | CURRENT AC  | DMM comparison                 |
| Subject | Presentation: Review in Resistance                      | Presentation: Review in HALL Resistance | Presentation: Review in Uncertainty  | Calibration of AC Current Sources:                                  | Presentation: Review in DMM    |
| Subject | Calibration of Resistors DC with DMM                    | Hall lab visit                          | Calibration of DC Current Sources: Calibrators with DMM                        | 1<20 A with Calibrator: Uncertainty evaluation                      | DMM comparison                 |
| Subject | Calibration of Resistors DC with Bridge                 | Calibration of Calibrator in Resistance | 1A< 1<50 A DC (or AC) with calibrator and 50-turn Coil: Uncertainty evaluation | Calibration of Clamp meters   | METCAL                         |
| Subject | Case Study: Calibration of Decade Resistors DC with DMM | Calibration of AC Shunt                 | Calibration of Current Meters DC   | Case Study: Calibration of Clamp with ZERA 1<320 A                  | Case Study: Calibration of DMM |
| Subject | Case Study: Calibration of Resistors DC with Bridge     | Case Study: Calibration of AC Shunt     | Case Study: Calibration of calibrator 5720A DC 1 with 4950 Transfer Standard   | Case Study: Calibration of energy Meter (current) TP2 with ZERA COM | Visit EIM labs                 |

(comparisons,  $r$ 's)



|   |                                |
|---|--------------------------------|
| <b>Training on Health and Medical Metrology</b><br>(Defibrillator analyzer, Electro-surgery analyzer, Patient simulator, Electrical safety analyzer, Infusion pump simulator, Pulse-oximeter analyzer, Gas flow analyzer, Radiotherapy and phototherapy devices, Ionized radiation devices (X-ray, CT), Proficiency tests for clinical measurements, Reference material production) | TR, MK                         |
| <b>Training on Humidity Metrology</b><br>(Hygrometers, Thermo-hygrometers, Data loggers with built-in humidity and/or temperature sensor, Dew-point meters with aluminum oxide sensor, Chilled-mirror dew-point meters, Psychrometers, Humidity chambers (divided-flow type), Climatic chambers, Moisture meters)   | TR, KS, ME, PL, MK, AL, BA, RS |
| <b>Training on Mass Calibration and Dissemination</b>   | TR, PL, MK, BA, ME, RS         |
| <b>Training on Thermometry</b>  | TR, KS, MK                     |
| <b>Comparison in field of Thermometry</b>   | TR, ME, AL, BA, RS             |
| <b>Comparison on DMM calibration</b>  | ME, PL, MK, AL, BA, TR         |

HI-CB activities: metrology capacity-building activities aiming to achieve a balanced and integrated metrology system in the participating states, including:

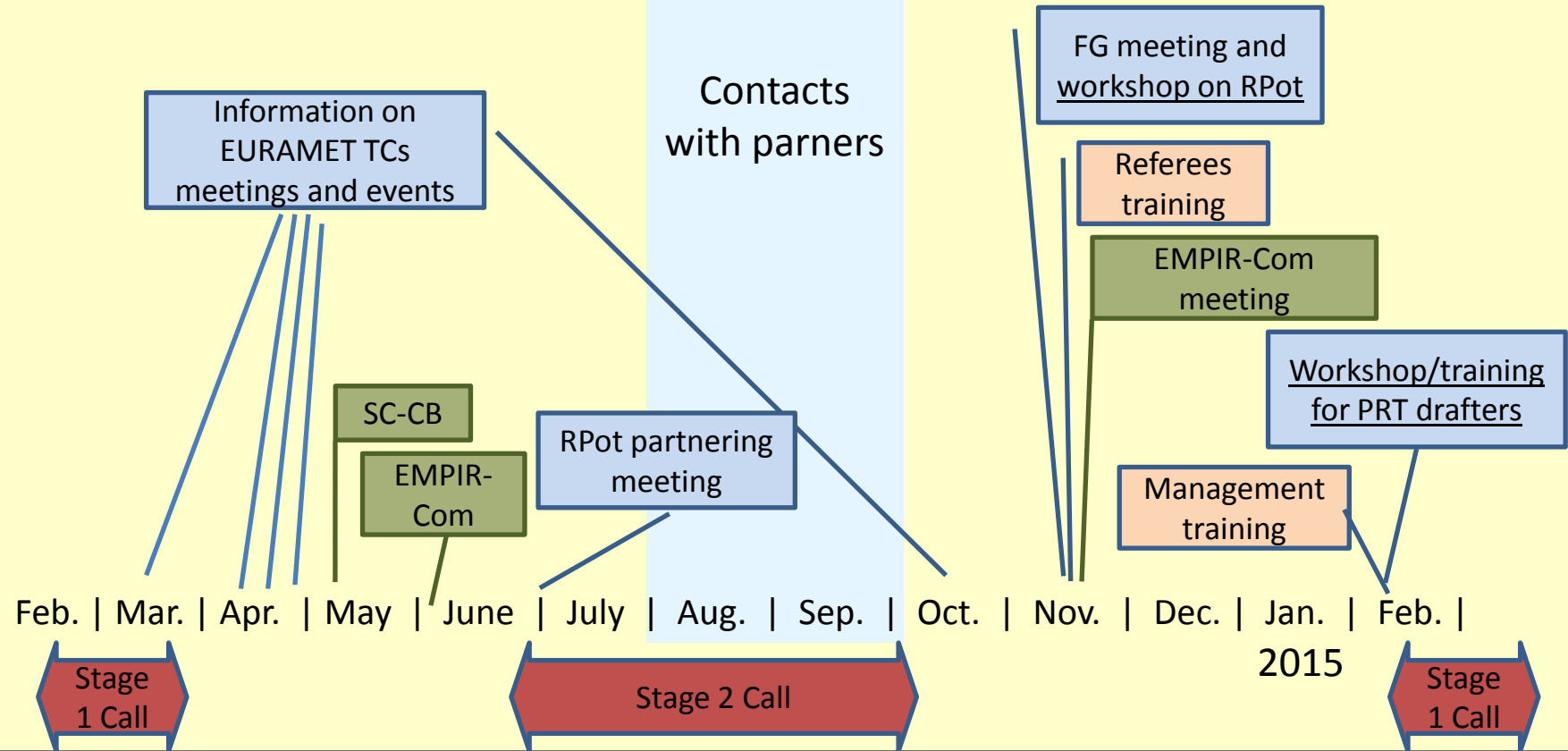
- *hand-on trainings on specific measurement procedures and improvement of traceability and uncertainty,*
- *trainings on interlaboratory comparisons and proficiency testing,*
- *trainings on metrological infrastructure, NMI management and implementation of relevant EU legislation,*
- *trainings on participation in (EMPIR) projects,*
- *trainings, events and preparation of materials on awareness raising.*

Activities will be performed by EURAMET members. Coordination, monitoring and administrative support will be performed by the EURAMET Secretariat.

Other CB central support actions coordinated by EURAMET secretariat and performed by EURAMET members:

- *small projects-type activities aiming in horizontal support of emerging NMIs, like development of a web-based interactive e-learning platform, training on laboratory automation procedures,*
- *short mobility grants (1-2 weeks) attached to specific (technical) activities from 1.1 and QMS peer review visits realised in form of EURAMET TCQ projects.*

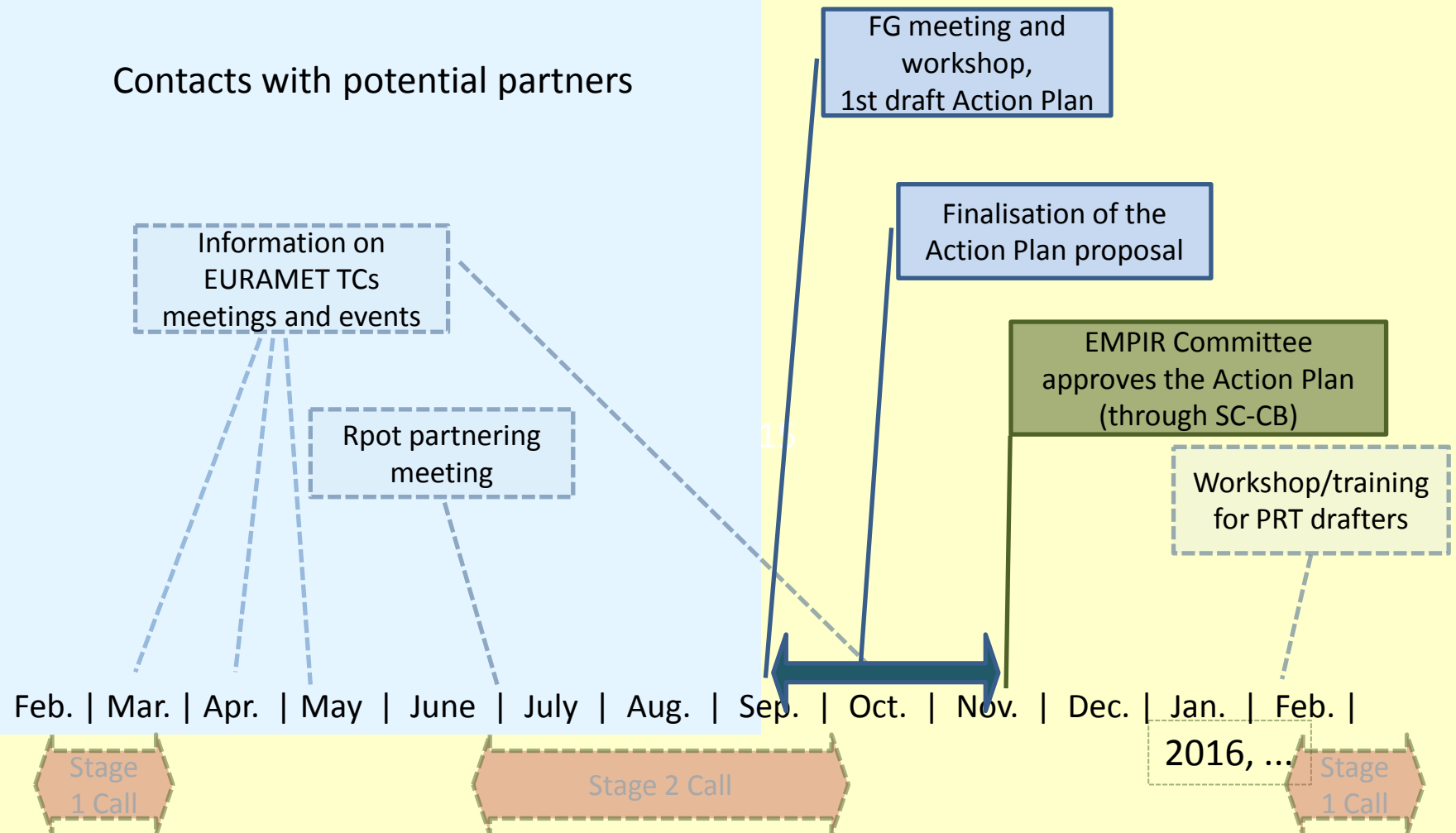
# Overview of the Rpot Call Cycle 2014/2015



Continuous support of EM Secretariat and MSU

# Anticipation of the HI-CB Plan. Cycle 2015/2016

## Contacts with potential partners



Continuous support of EM Secretariat

# Thank you!

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