Pre-commercial procurement: challenges and opportunities for the NREN community

TNC17 Conference
31 May 2017
Session Outlook

1. Introduction to the workshop, scope and expected results
   (Bartosz Belter, PSNC)

2. The EC position on Innovation Procurement
   (Lieve Bos, DG CNECT, EC)

3. The PCP/PPI tutorial
   (Sara Bedin, independent expert)

4. Success stories: PRACE 3IP
   (Rudolf Vohnout, CESNET)

5. The demand side: the ROWANet case
   (Petr Pavlinec, ROWANet)

6. Discussion and brainstorming
   (Chrysostomos Tziouvaras, GRNET)
HORIZON 2020 SUPPORT TO INNOVATION PROCUREMENT

Lieve Bos, DG CNECT, EC
Public sector is faced with important challenges. To tackle these challenges often public sector transformations are needed.

- In many cases, solutions are close to the market and would be provided if clear requirements/sufficient demand expressed by market. Incremental innovation (product adaptation, scaling up of production...) or non-R&D innovation (e.g. service innovation) can deliver required quality/price, so no need for R&D procurement. Public sector provides seal of approval for innovative solution by acting as launching customer/early adopter (PPI)

- In other cases, addressing the problem requires radical innovation, there is no available solution 'on' or 'close to' the market yet. There are different competing potential solution approaches but R&D still needed to de-risk and compare different technological alternatives before committing to large scale deployment. Procurer wants to induce step change in market (e.g. moving from proprietary/vendor lock-in to better open systems with multiple vendors incl. new players) (PCP)
- **PCP** to steer the development of new solutions towards concrete public sector needs, whilst comparing/validating alternative solution approaches from various vendors and enabling new players to prove themselves against established ones
- **PPI** to act as launching customer / early adopter / first buyer of innovative commercial end-solutions newly arriving on the market
Examples PCPs
EU funded Cloud

HNSci Cloud PCP

http://www.hnscicloud.eu

**Buyers group:** CERN (CH), INFN (IT), DESY & KIT (DE), CNRS (FR), SURFsara (NL), STFC & EMBL (UK), IFAI (ES)

HNSciCloud (Helix Nebula – the science cloud) groups research labs and institutes procure together R&D to develop a science cloud platform for the European research community with improved data analysis capability and capacity.

The NNSciCloud project follows the PICSE coordination and networking project.

Non-EU funded Health

Niguarda Hospital PCP


**Entities involved:** Lombardy region, Niguarda hospital, ARCA regional purchasing body

PCP to develop and test: easy-to-use automated universal system for moving hospital beds, with anti-collision and safety systems, not needing guide lines or tracks even on non rectilinear routes

**Benchmarking:** 40% expected cost savings (cheaper solution + less accidents and functional limitations)

PCP created market opportunities for SMEs (are selling already in other countries as well)
Examples PPIs
EU funded HPC

PPI4HPC

Project just started in April 2017.
Follows after PRACE3IP PCP.

**Buyers group:** supercomputing centers Juelich (DE), CAE/GENCI (FR), CINECA (IT) and BSC(ES) will launch a joint PPI procurement of € 73M.

PPI for HPC participants will coordinate their procurement roadmaps to contribute to building a European Data Infrastructure with high-end supercomputers, which will around 2022 reach the exascale performance level. The French partner will be the lead procurer.

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Non-EU funded Health

Erasmus University Medical Center PPI

URL: http://www.innovation-procurement.org/award/erasmus-mc/

**Procurer:** Erasmus Medical Center

Robotics based bed washing system
Won European PPI award 2014

**More efficient and sustainable healthcare solution**
Cost reduction: 35%
CO2 footprint reduction: 65%

Winning SME is growing its company successfully and expanding also to other markets
What can countries/regions do?

**Political encouragement**
- Modernising public sector 'a priority'
  Quality-efficiency improvement targets
  e.g. Lombardia/IT, UK, Flanders/BE
- Action plan, target % proc budgets to innovation, monitoring framework
  e.g. UK, NL, ES, Nordics, FR

**Implementation**
- Innov Proc Competence center
  Training / assisting procurers
  (e.g. SE, FI, ES, Flanders/BE, DE)
- Innov Proc financial support program
  (e.g. SE, FI, ES, Flanders/BE, DE)

**Encourage demand side to meet supply side**
- Early notification innov proc needs
- Open market consultations
  Meet the buyers events

**Leverage EU support**
- Horizon 2020
  Increased
- ESIF
  support for
- EIB loans
  innov proc
- European Assistance for Innov Proc

National innovation procurement policy initiatives

Priority in Policy FW
Action Plan
Target
Competence Center
Financial Incentives
Monitoring Framework

Progress PCP implementation
Learn from first movers

- Awareness Raising
  - Exploring possibilities

- Working on framework
  - Framework identified
    - and/or pilots in preparation
  - Pilots started

2007

- Malta
  - Denmark
  - Estonia
  - Iceland
  - Lithuania
  - Latvia
  - Luxembourg
  - Norway
  - Poland
  - Portugal
  - Slovenia
  - Sweden
  - Spain

2017

- Malta
  - Bulgaria
  - Cyprus
  - Czech Republic
  - Denmark
  - Estonia
  - Finland
  - France
  - Greece
  - Hungary
  - Iceland
  - Ireland
  - Italy
  - Latvia
  - Lithuania
  - Luxembourg
  - Netherlands
  - Norway
  - Poland
  - Portugal
  - Romania
  - Sweden
  - Spain
  - Switzerland
  - UK
  - Ukraine
  - Slovakia
  - Germany
  - Austria

Overview of EU funded PCPs/PPIs: [http://ec.europa.eu/digital-agenda/eu-funded-projects](http://ec.europa.eu/digital-agenda/eu-funded-projects)
- **Speed up public sector modernisation** – improve quality and efficiency of public services with breakthrough solutions

- **Get better value for money through cooperation** - enable public sector around Europe to share cost + experience to buy new solutions that can respond to concrete public needs

- **Address issues of common interest together** – e.g. where interoperability and coherence of solutions across borders, pooling of resources or market defragmentation is required

- **Create growth and jobs in Europe** – help innovators bring European R&D to the market (the majority of R&D in H2020 funded PCPs should take place in Europe, ltd set of first test products can be bought in the PPI from companies in the PCP)
Forms of support (Horizon 2020)

- **Coordination and Support Actions (100% funding rate):**
  - Support only coordination activities e.g. preparation of a PCP or PPI by a group of procurers (investigating feasibility to start PCP/PPI, open market consultation with industry before initiating a concrete PCP or PPI etc)
  - CSAs do not provide EU co-financing for an actual PCP or PPI procurement

- **PCP Actions (90% funding rate):**
  - Provide EU co-financing for an actual PCP procurement (one joint PCP procurement per PCP action) + for related coordination and networking activities (e.g. to prepare, manage and follow-up the PCP procurement)

- **PPI Actions (35% funding rate):**
  - Provide EU co-financing for the actual PPI procurement(s) (one joint procurement or several separate but coordinated PPI procurements per PPI action) + for related coordination and networking activities (e.g. to prepare, manage and follow-up the PPI procurement(s))
Overview EU funded projects doing **PCPs (FP7)**


**HEALTH AGEING**

- **THALEA (PCP)**
  - Tele-detection/care of ICU patients

- **SILVER (PCP)**
  - Robotics ageing well

- **DECIPHER (PCP)**
  - Services mobile health data

- **MAGIC (PCP)**
  - Post stroke recovery

- **EMPATTICS (PCP)**
  - Chronic disease self-management

- **NIGHTINGALE (PCP)**
  - Wearable sensors

- **STARS (PCP)**
  - Stress reduction

**PCP in Human Brain Project**

**NYMPHA-MD (PCP)**
- Mental care for bipolar disorders

**PCP on supercomputing / brain modelling**

**RELIEF (PCP)**
- Pain self-management

**ANTISUPERBUGS (PCP)**
- Detection of superbugs

**LIVE INCITE (PCP)**
- Life style interventions in perioperative care

**PROEMPOWER (PCP)**
- Diabetes disease self-management
Overview EU funded projects doing PCPs (FP7/H2020)


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<tr>
<th>E-GOV</th>
<th>Cloud for Europe (PCP)</th>
<th>Cloud computing e-gov</th>
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<tbody>
<tr>
<td>SELECTforCities (PCP)</td>
<td>HNSciClouds (PCP)</td>
<td>PREFORMA (PCP)</td>
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<td>Open IT platform for cities</td>
<td>Research Science Cloud</td>
<td>Long term digital preservation</td>
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<tr>
<th>TRANSPORT</th>
<th>EDUCATION</th>
<th>SAFETY</th>
<th>RESEARCH</th>
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<tbody>
<tr>
<td>CHARM (PCP)</td>
<td>IMAILE (PCP)</td>
<td>SMART@FIRE (PCP)</td>
<td>QUACO (PCP)</td>
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<td>Traffic Management</td>
<td>Personalised learning needs</td>
<td>Smart Textiles ICT for fire fighters</td>
<td>More powerful quadrupole magnets</td>
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<td>V-CON (PCP)</td>
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<td>Virtual road infrastructure modelling</td>
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<tr>
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SMART-MET (PCP) Smart Metering water sector
Overview EU funded projects doing **PPIs (CIP/H2020)**


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<td>Low carbon healthcare</td>
<td>Telemedicine for ICU patients</td>
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<td>Healthy Ageing</td>
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<td>RITMOCORE (PPI)</td>
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EU funded CSAs/Networks of procurers (FP7/CIP/H2020)


**HEALTH AGEING**
- **SAEPP (prep PCP)**
  - Ambulance ICT
- **C4BI**
  - Cities on healthcare
- **PRO4VIP (prep PCP)**
  - ICT for Visually impaired
- **EPP-eHealth (prep PCP/PPI)**
  - Hospitals e-health
- **INSPIRE (Training, link VC)**
  - E-health procurers

**TRANSPORT**
- **P4ITS**
  - ITS
- **TRANSFORM**
  - City/Regional transport
- **BUYZET**
  - CO2 free deliveries
- **SPICE**
  - Mobility
- **PICSE (Prep PCP/PPI)**
  - Research cloud
- **COMPLETE (Prep PPI)**
  - Photonics broadband
- **BROADMAP (prep PCP)**
  - Safety
  - Radio com police, firefighters

**SUSTAINABILITY**
- **WATER PIPP**
  - Water procurers
- **EURECA (prep PPI)**
  - Green data centers
- **GREENS (prep PPI)**
  - Energy agencies – CO2
- **CEPPI 2 (prep PPI)**
  - Cities – energy consumption
  - SPP regions (capacity building)
  - PPI – sustainability
  - InnProBio Forum (capacity building)
  - PPI – bio based products
- **BRODISE**
  - Cities brown field decontamination
- **PPI4WASTE**
  - Authorities
  - Waste management
• **Shortening of time-to-market:** UK National Health service PCP examples achieve reduction from several years to 18 months

• **Attracting venture capital:** Companies in UK NHS PCPs attract significant VC investment, enabling them to grow faster

• **Creating lead markets:** Companies in UK ministry of defence PCPs are selling now also to US department of defence

• **Retaining lead market position:** possible via sustained PCP/PPI procurements (e.g. 60 yrs of supercomputing PCPs -> IBM, Cray, HP)

• **20% cheaper products and higher product quality:** evidence from US defense multi competitor, multi phase PCP-PPI procurements

• **Removal of supplier lock-in -> 20% cost reduction:** outcome of benchmarking of CHARM PCP on new traffic management centres thanks to move towards open architecture via PCP

• **Benefits on local economy:** Estonia PPI buying Mitsubishi electric vehicles increased local Estonian economic activity in related sectors
Data collected from first 16 EU funded PCPs

- 16 EU funded PCPs that awarded contracts (5 already finished)
  - 73 procurers involved, 104 tenderers/consortia of tenderers involved

- Opening route-to-market for new players/SMEs
  - 71% of contracts won by SMEs (SME lead bidder, bidding alone or with partners)
  - Compared to 29% in public procurements across Europe
  Mostly small young SMEs: 24% below 10 people, 75% below 50 people, 50.5% less than 10 years old

- Stimulating cross-border company growth
  - 28% of contracts won by bidders that are not from a country of any of the procurers in the buyers group (e.g. DE company working for UK+NL procurers)
  - Compared to 1.26% in public procurements across Europe

- Relevance of PCPs also to universities
  - 34.6% of winning contracts have university/R&D center partner in consortium
  - Winning SMEs are also often university start-ups

- Creating growth and jobs in Europe
  - All bidders do 100% of R&D in Europe (except 1 doing 85% of R&D in Europe)

- Improving the quality and efficiency of public services
  - All completed PCPs have delivered innovative solutions that achieve the expected quality and efficiency requirements set out initially by the procurers
Next major EU innovation procurement event

Innovation procurement policy initiatives and case examples from around Europe
European Assistance for Innovation Procurement Networking on H2020 calls on innovation procurement

Online programme and registration
http://eafip.eu/events/3rd-major-eafip-event-tallinn/
More info on Innovation Procurement:

PPTs, FAQs, template tender documents for H2020 funded PCP projects:

Overview ongoing PCP/PPI projects in ICT and other domains:

Results finished and ongoing EU funded PCP projects:

More detailed info on PCP/PPI action instrument, evaluation criteria etc in General Annexes to the H2020 Work Program:
http://ec.europa.eu/research/participants/portal/desktop/en/funding/reference_docs.html#h2020-work-programmes-2016-17

Info about scope of each call topic, online drafting and submission of proposals on H2020 participants portal (search per topic e.g. ICT-34):
Back-up slides
H2020 support to Innovation Procurement
PCP/PPI Actions + Coordination and Support Actions (CSAs)
Coordination and Support Actions (100% funding rate):

- Support only coordination activities e.g. preparation of a PCP or PPI by a group of procurers (investigating feasibility to start PCP/PPI, open market consultation with industry before initiating a concrete PCP or PPI etc)
- CSAs do not provide EU co-financing for an actual PCP or PPI procurement

PCP Actions (90% funding rate):

- Provide EU co-financing for an actual PCP procurement (one joint PCP procurement per PCP action) + for related coordination and networking activities (e.g. to prepare, manage and follow-up the PCP procurement)

PPI Actions (35% funding rate):

- Provide EU co-financing for the actual PPI procurement(s) (one joint procurement or several separate but coordinated PPI procurements per PPI action) + for related coordination and networking activities (e.g. to prepare, manage and follow-up the PPI procurement(s))
In addition, other entities can also participate
- In buyers group: also private/NGO procurers providing services of public interest
- In coordination/networking activities: any private/public type of entity (e.g. experts, end-users, certification bodies that assist procurers) that has no conflict of interest (no potential suppliers of solutions for the PCP/PPI)

Minimum 3 independent participants from 3 different MS or AC, of which minimum 2 public procurers (buyers group) from 2 different MS or AC

Public procurers are contracting authorities or contracting entities as defined by the EU public procurement directives

MS = Member States
AC = Countries Associated to Horizon 2020
Buyers group
- Beneficiaries that provide the financial commitments for the PCP or PPI(s).
- Min 2 public procurers from 2 different Member States or associated countries
- Shall represent the demand side for the innovations, a critical mass of procurers that can trigger wide implementation of the innovations, shall aim for ambitious quality/efficiency improvements in area of public interest.

Lead procurer
- Public procurer in project appointed by the buyers group to lead and coordinate the PCP or PPI(s). Can be part of buyers group or not.

Subcontractors
- Successful tenderers, selected by the buyers group & lead procurer as result of the PCP or PPI call for tender, to provide the R&D services (PCP) or innovative solutions (PPI).
- They do 'NOT' enter the grant agreement with the EC.
Every project goes through a preparation stage and an execution stage.
In the proposal, the consortium shall already identify:

- A concrete 'common challenge' on which the PCP/PPI will focus (e.g. new solution needed to improve energy efficiency of data centres)
- KPIs (targeted quality/efficiency improvements) for the PCP/PPI (e.g. target is energy efficiency improvement of min 30%)
- Illustrating how this challenge fits in the innovation strategy / plans of the participating procurers that require innovative solutions (e.g. city procurer a/b/x aims to upgrade x/y/z data centres by 2018)
- Requested budget per participant and plan for preparing and executing the procurement + for the coordination and networking activities

Example proposal: contact IMAILE PCP project (www imaile eu)
Note this is an FP7 not H2020 proposal (differences in funding rates & proposal template)

Material Info day: Practical info how to find partners, how to prepare a proposal etc (ppts + video)

Attractive success rates for proposers
Preparation stage
- Preparation of one joint PCP procurement (PCP action) or one joint or several separate but coordinated PPI procurements (PPI action) per action
  - Open market consultation /verifying market readiness to meet proc. need
- Outcome
  - Agreed common tender specifications + Joint procurement agreement
  - Confirmation of availability of financial commitments to start PCP/PPI

Execution stage
- Joint procurement of the R&D services (PCP) or innovative solutions (PPI)
- Follow-up of suppliers and validation of results
  - PCP: Validation/comparison of the performance of the competing PCP solutions against jointly defined criteria in real-life operational conditions
  - PPI: Evaluation of results of deploying and operating the procured solutions in real-life operating conditions
- Dissemination/exploitation of results

Other coordination/networking activities relevant to the action (e.g. preparation of follow-up PPI, contribution to standardisation / regulation / certification)
Reimbursement rate direct costs: Max 90% respectively 35% of eligible costs for PCP respectively PPI actions

- Eligible direct costs to carry out eligible activities defined in WP include:
  - Price of the R&D services (PCP) or innovative solutions (PPI) procured (if procurement conducted in compliance with requirements in Annex E WP)
  - Eligible coordination and networking activities
  - May include in-kind contributions (e.g. third parties putting resources at disposal of beneficiaries e.g. for testing of solutions)
  - VAT is an eligible cost unless for beneficiaries that can deduct it

- Requested reimbursement for coordination and networking activities can comprise max 30% (for PCP) / max 50% (for PPI) of total requested grant

Plus 25% for indirect costs. But, no indirect costs on the price of the PCP/PPI procurement or on 3rd party resources not used at the beneficiary premises

Pre-financing: Yes, 1st pre-financing at start project for costs for preparation stage, 2nd pre-financing before execution stage for rest of costs (incl. call for tender)
OVERVIEW REMAINING H2020 CALLS ON INNOVATION PROCUREMENT (PCP+PPI) IN 2017
Calls that are still open in 2017

- **PCP actions**
  - Broadband coms security: 10 M€ *(4-DRS, 24 August 2017)*
  - Forensics: 10 M€ *(9-FCT, 24 August 2017)*
  - Border control: 10 M€ *(13-BES, 24 August 2017)*

- **PPI actions**
  - Energy efficiency: part of larger call *(EE-19, 7 June 2017)*

PCP actions: co-finance (90%) actual procurement cost for joint PCPs + coordination costs
PPI actions: co-finance (35%) actual procurement cost for joint PPIs + coordination costs
CSA actions: co-finance (100%) only coordination costs e.g. procurer networks preparing future PCPs/PPIs
What is eafip?

A service set up by the DG CNECT (run by external contractors)
- Horizon 2020 supports groups of procurers to do joint PCPs/PPIs together
- eafip supports procurers to start PCP/PPIs on their own nationally
  (for procurers that do not receive other EU support for preparing a PCP/PPI)

What does eafip offer?

- **Training across Europe**
  - 3 major events and 9 workshops with procurers in different sectors 2015-18
  - Register [here](#) to see locations & programs of planned events/workshops

- **Toolkit, helpdesk, survey and contact list of key procurers**
  - Training is based on toolkit on why and how to implement PCP/PPI
  - Helpdesk that posts replies to questions - FAQs online [here](#)
  - Survey to consult procurers about future areas of interest for PCP/PPI [here](#)
  - Contact list of key (ICT) procurers in all MS in 10 public sector areas [here](#)

- **Free local assistance**
  - For public procurers starting PCPs and PPIs for ICT based solutions
  - Includes legal assistance in the start-up and implementation of a PCP/PPI
  - At least 6 PCPs and 6 PPIs will receive assistance
  - Register [here](#) your interest to receive assistance

[www.eafip.eu](http://www.eafip.eu)
Possible synergies between ESIF and Horizon 2020 on innovation procurement

Lieve Bos
Policy Officer Innovation Procurement
Innovation Unit (F2)
DG CNECT
European Commission
IT IS NOT ALLOWED !!!!!!

- To use ESIF and H2020 funding accumulatively to finance the same cost/expenditure item

- To finance the own contribution of the participant from H2020 or ESIF
CATEGORIES OF POSSIBLE SYNERGIES BETWEEN H2020 AND ESIF ON PCP/PPI

- Joint or simultaneous use of funds
- Sequential funding
- Additional funding
- Alternative funding
A. JOINT OR SIMULTANEOUS USE OF FUNDS

Different funding sources in the same project. This is only possible if the cost items (eligible and submitted) are NOT the same.

Requires very strict financial management to separate the cost items clearly from the conception phase of the project and will only work if the funding decisions of H2020 and ESIF are synchronised.

The rules of both funding sources (ESIF – H2020) should be respected by all beneficiaries even if they receive co-financing from only one funding source.
A partner who receives co-financing from ESIF to participate in a H2020 project should also respect the H2020 rules and vice versa.
Possible scenario on PCP

- Preparation of the PCP procurement is supported by H2020 or ESIF
- In the framework of PCP action calls, some participants of the buyers group may receive co-funding from the ESIF and others from H2020.
- This case is applicable only if there is a clear distinction between budgets offered per OP and between expenditures co-funded by the ESIF (per OP) vs expenditures co-funded by H2020.

Example - each R&D provider is paid pro rata by each procurer in the buyers group according to the share of each procurer's contribution to the jointly committed budget.

Condition for success: synchronization between the ESIF calls and the H2020 PCP action calls
Coordination, Preparatory etc. activities are co-funded by H2020 (CSAs)

**CO-FUNDING RATE** 100% + 25% for eligible indirect costs OR

Coordination, Preparatory etc. activities are co-funded by the ESIF (ESIF OPs or European Territorial Cooperation Programs)

**DIFFERENT CO-FUNDING RATE PER PROGRAM AND/OR PARTICIPANT**

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<th><strong>EXECUTION OF A JOINT PCP</strong></th>
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<tbody>
<tr>
<td><strong>PROCURER A</strong> (Less developed Region)</td>
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<tr>
<td>CO-FUNDS HIS CONTRIBUTION TO THE JOINTLY COMMITTED BUDGET THROUGH THE ESIF</td>
</tr>
<tr>
<td><strong>CO-FUNDING RATE</strong> up to 85% (for his contribution)</td>
</tr>
</tbody>
</table>

| **PROCURER C** |
| CO-FUNDS HIS CONTRIBUTION TO THE JOINTLY COMMITTED BUDGET THROUGH H2020 |
| **CO-FUNDING RATE** 90%* + 25% for eligible indirect costs (for his contribution) |

| **PROCURER B** (Transitional Region) |
| CO-FUNDS HIS CONTRIBUTION TO THE JOINTLY COMMITTED BUDGET THROUGH THE ESIF |
| **CO-FUNDING RATE** up to 60% (for his contribution) |

| **PROCURER D** |
| CO-FUNDS HIS CONTRIBUTION TO THE JOINTLY COMMITTED BUDGET THROUGH H2020 |
| **CO-FUNDING RATE** 90% + 25% for eligible indirect costs (for his contribution) |

* New from 2016-2017 Horizon 2020 work programmes onward
Possible Scenario on PPI

ESIF or H2020 co-finance the preparation of the PPI
In case that they haven't received co-financing for the preparatory activities these can be co-funded by the PPI actions.

Some procurers located in a less developed Region use co-funding from the ESIF (up to 85% rate) and other procurers in other MS use co-funding from H2020 (35% rate) to purchase the innovative solution.

- The lead procurer launches one procurement procedure, signs all the contracts and pays all the invoices on behalf of all procurers in the buyers group.

or

- The lead procurer launches one procurement procedure and awards the Framework Contract/Agreement (possibly with lots per procurer). Procurers in the buyers group implement separate specific contracts (for their lot) under their national law and pay individually the invoices corresponding to the innovative solutions they each procure.

or

- Each procurer in the buyers group launches separate coordinated procurement procedures under its own national law (using commonly agreed tender specs), signs the contract(s) and pays all the invoices for the solutions it procures for itself.
Coordination, Preparation etc. activities are co-funded by H2020 (CSA)

**CO-FUNDING RATE 100% + 25% for eligible indirect costs**

*OR*

Coordination, Preparation etc. activities are co-funded by the ESIF (e.g. ETC program)

**DIFFERENT CO-FUNDING RATE PER PROGRAM AND/OR PARTICIPANT**

<table>
<thead>
<tr>
<th><strong>PROCURER A</strong></th>
<th><strong>PROCURER C</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>purchases the innovative solution with H2020 support</td>
<td></td>
</tr>
<tr>
<td><strong>CO-FUNDING RATE</strong> 35% + 25% for eligible indirect costs (for his contribution)</td>
<td></td>
</tr>
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<td><strong>CO-FUNDING RATE</strong> 35% + 25% for eligible indirect costs (for his contribution)</td>
<td></td>
</tr>
</tbody>
</table>

**EXECUTION OF ONE JOINT or SEVERAL COORDINATED PPIs**

<table>
<thead>
<tr>
<th><strong>PROCURER B</strong> (Less developed Region)</th>
<th><strong>PROCURER D</strong> Less developed Region</th>
</tr>
</thead>
<tbody>
<tr>
<td>purchases the innovative solution with the support of the ESIF in line with the objectives of the relevant O.P</td>
<td></td>
</tr>
<tr>
<td><strong>CO-FUNDING RATE up to 85% (for his contribution)</strong></td>
<td></td>
</tr>
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<td>purchases the innovative solution with the support of the ESIF in line with the objectives of the relevant O.P</td>
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<td><strong>CO-FUNDING RATE up to 85% (for his contribution)</strong></td>
<td></td>
</tr>
</tbody>
</table>
In one project/consortium that prepares a future joint PCP or PPI, procurers A and B from less developed regions are co-funded by the ESIF (up to 85% co-funding rate) and procurers B and C are co-funded by H2020 (via CSAs – if there is a specific call with co-funding rate 100% + 25% for eligible indirect costs)

- The execution of the joint PCP/PPI can follow one of the scenarios presented in the previous slides.
- Minimum conditions for success:
  - Separate and distinguished cost/expenditure items even at project proposal level
  - Synchronization and coordination between ESIF MAs and H2020 Managing Bodies
| **PROCURER A**  
| (Less developed Region) |  
| **PROCURER B**  
| (Transitional Region) |  
| Coordination and networking activities to prepare for a PCP are co-funded by the ESIF | Coordination and networking activities to prepare for a PCP are co-funded by the ESIF  
| **CO-FUNDING RATE up to 85%** (for his contribution) | **CO-FUNDING RATE up to 60%** (for his contribution)  
| **PROCURER C**  
| Coordination and networking activities to prepare for a PCP are co-funded by H2020 (CSA) |  
| **PROCURER D**  
|  
| Coordination and networking activities to prepare for a PCP are co-funded by H2020 (CSA) |  
| **CO-FUNDING RATE 100% + 25%** for eligible indirect costs (for his contribution) | **CO-FUNDING RATE 100% + 25%** for eligible indirect costs (for his contribution) |
**EXECUTION OF A JOINT PPI or COORDINATED PPIs**

<table>
<thead>
<tr>
<th>PROCURER A</th>
<th>PROCURER B</th>
<th>PROCURER C</th>
<th>PROCURER D</th>
</tr>
</thead>
<tbody>
<tr>
<td>(Less developed Region)</td>
<td>(Transitional Region)</td>
<td>Coordination and preparation etc. activities for a PCP are co-funded by H2020 (CSA)</td>
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<tr>
<td><strong>CO-FUNDING RATE up to 85% (for his contribution)</strong></td>
<td><strong>CO-FUNDING RATE up to 60% (for his contribution)</strong></td>
<td><strong>FLAT CO-FUNDING RATE 100% + 25% for eligible indirect costs (for his contribution)</strong></td>
<td><strong>FLAT CO-FUNDING RATE 100% + 25% for eligible indirect costs (for his contribution)</strong></td>
</tr>
</tbody>
</table>
B. SEQUENTIAL FUNDING

Separate successive and legally/financially not linked projects with alternating H2020 or ESIF support –
- First PCP and then PPI –

This is an easier way to combine funds with less risk of (involuntarily) creating double co-funding scenarios.

Sequential funding can go in both directions:
First ESIF and then H2020 or vice versa.
Possible Scenario

First PCP (H2020) to develop and test the innovative solution and then PPI (ESIF) for the deployment of the innovative solutions developed and tested through PCP and vice versa (ESIF for PCP and H2020 for PPI)

Example:

A group of Public Procureurs from different cities are looking for a new sustainable public water supply system. It requires R&D. At first they implement a PCP (Phases 1, 2, 3) with the support of H2020 and different solutions are developed and tested.

Thereafter they implement a PPI with the support of ESIF/ERDF to co-fund the preparation of the call for tender and the purchase of these new solutions (each MA for the territory covered by its OP).
C. ADDITIONAL/PARALLEL USE OF FUNDS

ESIF money is not linked to a H2020 project (PCP/PPI), but a regional/national authority decides to co-fund a regional/national project or beneficiaries to enhance the H2020 project or programme in its region.

This may be particularly relevant to skills development or capacity building in innovation and cooperation.

Example

Skills enhancement of the public procurer focused on the use of the innovative product that is purchased in the framework of a PPI that is co-funded by H2020.
D. ALTERNATIVE FUNDING

- ESI Funds could be used for project proposals that have received positive evaluation under H2020 and could not be co-funded due to lack of H2020 funds under the call.

- These proposals could be reoriented towards ESIF requirements and submitted at national/regional level, if this type and topic of project fits into the operational programmes of the concerned territories.
CONDITIONS FOR SUCCESS

- Include innovation procurement in the RIS3 SWOT and policy mix.
- Build PCP/PPI references into OPs in every relevant thematic objective.
- Ensure support of public demand driven innovation in the framework of the European Territorial Cooperation.
- Involve MA from the beginning to ensure availability of ESIF & synchronisation.
Thank you very much for your attention

Lieve Bos
Policy Officer Innovation Procurement Start-ups and Innovation Unit (F2)
DG CNECT
European Commission
PRACE-3IP
Pre-Commercial Procurement
“Whole System Design for Energy Efficient
High Performance Computing (HPC)”

Rudolf Vohnout, CESNET on behalf of
Philippe Segers, GENCI
PRACE is an international not-for-profit association under Belgian law, with its seat in Brussels.

PRACE has 25 members and 2 observers.

PRACE is governed by the PRACE Council in which each member has a seat. The daily management of the association is delegated to the Board of Directors.

PRACE is funded by its members as well as through a series of implementation projects supported by the European Commission. Computing resources are made available by a group of members (Hosting Members).
PRACE Hosting Members offering of core hours on 7 world-class machines

**MareNostrum:** IBM BSC, Barcelona, Spain

**JUQUEEN:** IBM BlueGene/Q GAUSS/FZJ Jülich, Germany

**CURIE:** Bull Bullx GENCI/CEA Bruyères-le-Châtel, France

**SuperMUC:** IBM GAUSS/LRZ Garching, Germany

**Hazel Hen:** Cray GAUSS/HLRS, Stuttgart, Germany

**Piz Daint:** Cray XC 30 CSCS, Lugano, Switzerland

**MARCONI:** Lenovo CINECA Bologna, Italy

**NEW ENTRY 2016**
Goals of the “Whole System Design for Energy Efficient HPC” PCP

• Fostering advances in energy efficiency (major TCO driver for HPC & Big Data)
• Energy wall for Exascale requires an O(100) increase of power efficiency
• Assessment of results through a pilot scalable to 100 PFlop/s

PRACE PCP Process and assessment methodology

• 3 phases competitive process:
  - Solution design (6 months, funding 10%)
  - Prototype development (10 months, funding 30%)
  - Pre-Commercial Pilot system (16 months, funding 60%)
• Assessment on “real” application benchmark from PRACE (suitable for PRACE 2)

Expected results and impact

• EU HPC supply industry (80% of R&D must be performed in EU) increase competitiveness
• EU HPC users (academia and industry) get early access to disruptive technology through PCP pilot
• EC and PRACE are learning by doing a new public procurement procedure, with high leverage effect
• PRACE procure Intellectual Property (IP) that paves the way toward sustainable Exascale:
  - IP is kept by HPC suppliers
  - Discount on future IP usage for PRACE members of the Group of Procurers of the PCP
Organization of the PRACE PCP

• **Procurers:**
  - Five PRACE-3IP partners (CINECA, CSC, EPCC, Juelich, GENCI) and PRACE aisbl as observer
  - A GoP (Group of Procurers) was formed and contractually regulated by an agreement
  - 9 M € Budget contributed by the procurers and EC (50/50)

• **Governance:**
  - Based on the GoP Committee as decision-making entity
  - CINECA has been selected as the Procuring Entity
  - Coordination between the Procuring Entity and the project assured
PRACE PCP Phases

**EXECUTION STAGE**

**Solution design**
- Phase 1 - 6 months
  - Supplier A
  - Supplier B
  - Supplier C
  - Supplier D
  - Supplier E
  - Supplier F

**Prototype development**
- Phase 2 - 10 months
  - Supplier B
  - Supplier C
  - Supplier D

**Pre-commercial small scale production/ service development - Field test**
- Phase 3 - 16 months
  - Supplier B
  - Supplier C

**Final outputs:**
- * 2 prototypes
- * R&D (IP) useful for PRACE

**Framework contracts and contracts for phase 1**
- T1
  - 1 month
  - 3 weeks
  - 2 weeks

**Result assessment**
- Supplier selection
  - Call closure - tender submission deadline
  - Publication of award criteria

**Award contract**
- Start phase 2
- Phase 2
  - 1 month
  - 3 weeks
  - 2 weeks

**Result assessment**
- Supplier selection
  - Call closure - tender submission deadline
  - Publication of award criteria

**Award contract**
- Start phase 3
- Phase 3
  - T1 + 17 months
  - T1 + 18 months

**Lessons learnt - Recommendations use PcP for HPC**
- T1 + 34 months
PRACE general prototyping expertise

- Identification of User Requirements
- Technology Watch
- Assessment of emerging Technologies
- Joint Developments with Vendors
- Recommendations for: Procurements
- Recommendations for: Deployment of mature Software Technologies
- Recommendations for: further Developments

• Prototyping is a mandatory step in the selection and deployment of new technologies
• Prototyping is a vehicle for cooperation with technology providers

02/03/2017
Atos/Bull PCP Pilot System Configuration

• **Bull Sequana cell** - 511 TFlops
  – EDR 100 Gbps interconnect
  – 56 Bull Sequana X1210 blade
  – 168 Intel® Xeon Phi™ 7250 processors
  – Powered by Bull SCS5

• **R&D specific work**
  – High frequency High resolution Energy monitoring system using FPGA
  – Smart energy management sub-system

• **Application support with CEPP**
E4 PCP Pilot System Configuration

- RESEARCH and PRODUCTION PROJECT
- CUSTOMIZED COMPUTE NODES by WISTRON
- IBM POWER8+ with NVIDIA NVLink
- NVIDIA® TESLA® P100 SXM2
- LIQUID COOLING
- POWER MONITORING & PROFILING, POWER MANAGEMENT, POWER CAPPING & PREDICTION
- CODE PORTING & OPTIMIZATION
- OPEN RACK FORM FACTOR with INTEGRATED PIPING & POWER DISTRIBUTION
- SYSTEM DESIGN, INTEGRATION, TESTING and DELIVERY
- PETAFLOP-CLASS COMPUTING CLUSTER
Maxeler’s PCP Pilot System Configuration

- UltrascalePlus VU9P FPGA
- 350Mb total on-chip RAM (FMEM)
- 11.5k x DSP units (mul/add)
- 1,182k x Logic Elements
- 128 GB DDR4 @ 1,200 MHz (LMEM)
- 32GB of Micron HMC memory
- Compatible with AWS F1 Instance
- Most budget spent on application porting
- Easy integration in HPC datacenter
- High energy efficiency

02/03/2017

PRACE PCP - Successful R&I in Europe
Conclusions

• First pan-European PCP on HPC, and it successfully made it to Phase 3
• 80% of the R&D must be performed within Europe
• More than 50% of the budget must be dedicated to R&D
• Evaluation criteria focussed on specific technological aspects and (PRACE) real-world benchmark (UEABS)
• IPR management is critical and must be kept attractive for PRACE & vendors
• Work on Energy-efficiency measurement methodology will be useful beyond the PCP for other HPC and Data Centre procurement (TCO evaluation)
• High leverage opportunity for HPC & Big Data sector in Europe:
  ➔ If PCP budget match the cost to tackle selected technological locks
  ➔ Must produce useful “Pre-Commertial” innovation (no blue sky R&D)
  ➔ Proof of the pudding will be in the eating
ROWANet.CZ
Regional Self-government Network

The procurement challenges and experiences

Petr Pavlinec, CIO Vysocina RA
Vysocina Region

- One of the 14 Czech regions
- 704 municipalities, 510 thousands inhabitants
- ICT - one if the key priorities of the region

ROWANet

- Regional backbone fiber optics network
- Covering 15 cities and more than 100 public organizations (public authorities, hospitals, universities, schools, firefighters, policie, emergency, ...)
- Basic technical infrastructure (network, datacenters, security) for regional e-services
- 12 years of cooperation with CESNET – Czech Academic e-Infrastructure
Network topology

**ROWANet**
- Owned by region

**ROWANet III.**
- Future development

A network topology map showing various points of interest and connections between them.
P2P cooperation („barter trade“)
- National Backbone x Regional Backbone (and last miles)
- Storage services (EIGER) x Datacenter hosting (10 racks)
- Regional ISP for Academic E-Infrastructure

A2P (Academic to Public body transfer)
- EDUROAM regional expansion
- EduID and eID federation services
- Regional CSIRT team and security solution

PPI (Public Procurement of Innovation)
- DWDM implementation – CzechLight amplifiers
- Fotonic services – integration to regional backbone
Public Procurement of Innovation - administration

- “Agreement on cooperation in research and innovation”
- Unique services for the realization of research, experimental or innovative projects (In accordance with the Public Procurement Act)
- Enhancing the capabilities of GÉANT, NREN, metropolitan and local networks
- The subject of the agreement is the cooperation of the parties to the research of network photonics applications
- Ratification by regional parliament
Contact

Regional Authority of the Vysocina Region,
Žižkova 57, Jihlava 587 33

www.kr-vysocina.cz

www.rowanet.cz

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- Skype: pavlinec
- Tel: +420 724 650 102