QUACO and PCP as an approach to interest potential industrial partners

M. Losasso

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Why an innovation course

The purpose of the Innovation Course is to let students, young graduates and young professionals explore the potential use of their gained knowledge outside the CERN-context and to familiarize them with established innovation practices.

The aim is to inspire students/young professionals to think “outside the box” and teach them basic skills how to think like an innovator and an entrepreneur, thus offering them new skills and competences which they may find useful later on in their careers.

Why talking about QUACO and the PCPs?

Innovation is seen too often as an objective in itself. Pushed by research centres and far away of industry.

Industry innovates only when sees a real market behind the innovation and a low risk for its investment

We miss the link between innovation an industry.

We need a mechanism to put them together

What does the QUACO PCP tell us?

Quaco challenge shows that it is possible to engage industries into

Technically difficult projects,
Financially risky projects,
With low market impact,
In an EU market environment dominated by few big players

…using the right mechanism

QUACO Challenge

The challenge:

- Procure 2 pilot 3,8 m quadrupole magnets (Q4) with two 90 mm aperture, an integrated gradient of 440T with 120T/m in the transverse plane, with operational temperature of 1.9K that will be installed in the HL-LHC.
- Put together different research centres with the same objective and demonstrate that is possible to procure together.
- Get SMEs in the market as we knew big players were not interested in small series.
- Innovate manufacturing methods

QUACO Benefits

Direct benefit (*buyers groups*)

- Pool resources to implement the project necessary for Hi-Lumi LHC
- Shorten the time to completion and reduce the cost

Indirect benefit (*companies and society*)

- Acquire know-how potentially transferable to other market than HEP
- Increase industrial capabilities by deploying tools usable for similar manufacturing

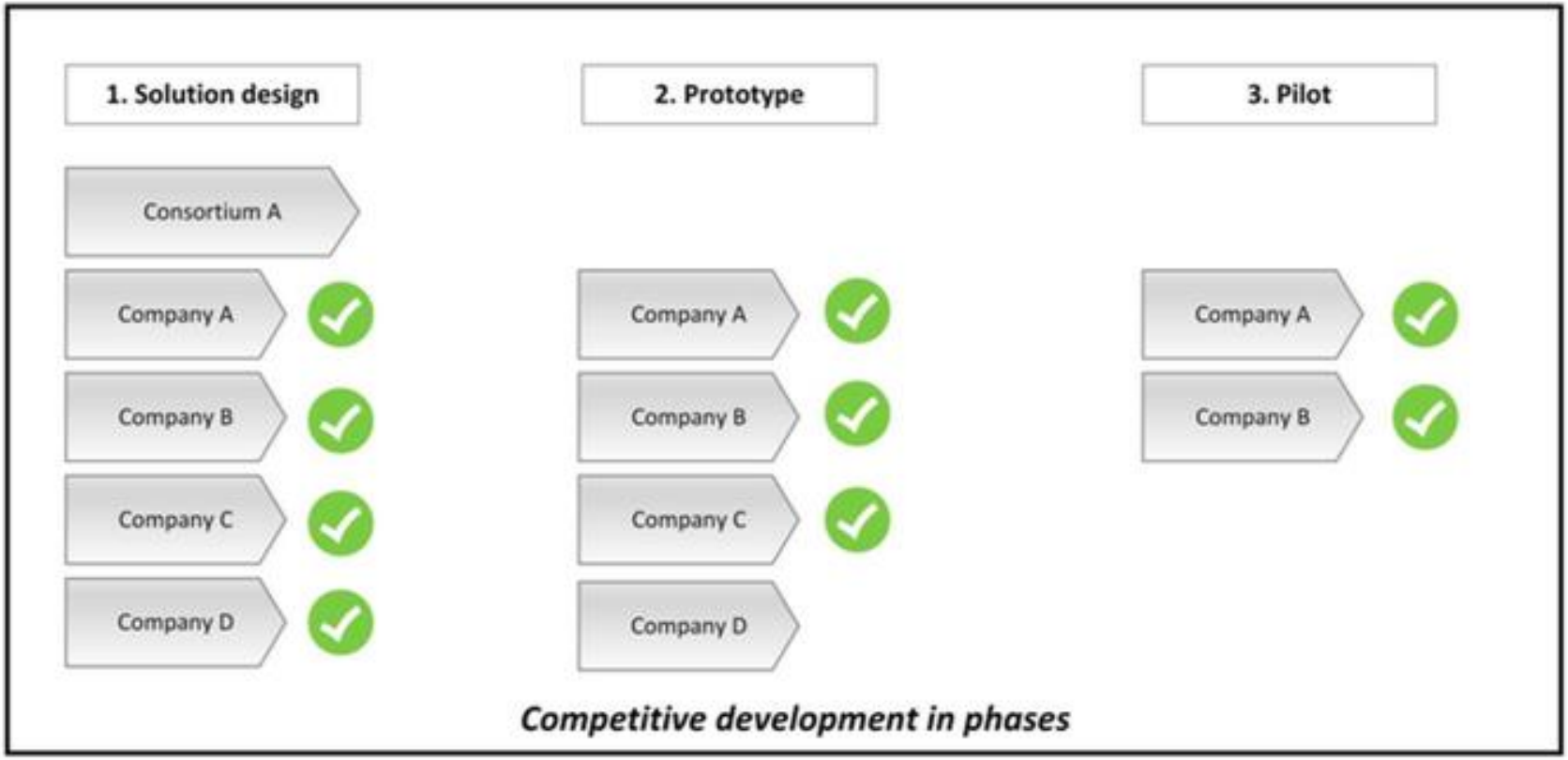
QUACO mechanism

What is Pre-Commercial Procurement (PCP)?

PCP is a phased approach for purchasing R&D services by procurers for the development of innovative products, services or processes by enterprises/research centres that are not yet available on the market. The overall goal is:

- to solve socio-economic challenges
- to improve the performance, functionality of public services
- One of the biggest advantages of PCP is the sharing of both opportunities and risks by both the public buyers and the private suppliers. It allows public purchasers to get innovative solutions to satisfy challenging needs, and support enterprises in their R&D.

PCP: Competitive development in 3 Phases



Why a PCP

- No off-the-shelf technology is ready to meet the challenge represented by HL-LHC needs. The most advanced solutions investigated are still at an immature level of development.

- A “conventional” tender instrument cannot address the purpose of the challenge. Indeed, the R&D effort is not matched by the potential large volume of advanced products to attract large companies. The technological risk is too high for small companies, and eventually, the market basis is very small.

- On the other side, the PCP instrument can serve the purpose of enlarging the market basis (by reducing financial barrier for SMEs), to attract SMEs (by sharing the technological risk of committing into difficult R&D), to mitigate risk of over or under specifications, by engaging industries at the early stage).

Steps to launch a PCP (buyers group)

- Share your idea/need
- Find partners
- Get support to prepare your proposal
- Find the 10% budget that will not be covered by the EU
- Write and submit your proposal.

Key factors

Excellence	Impact	Quality and efficiency of the implementation
- Clarity and pertinence of the objectives - Credibility of the proposed approach - Soundness of the concept - Quality of the proposed coordination and / or support measures.	- The expected impacts listed in the work programme under the relevant topic - Effectiveness of the proposed measures to exploit and disseminate the project results (including management of IPR), to communicate the project, and to manage research data where relevant	- Coherence and effectiveness of the work plan, including appropriateness of the allocation of tasks and resources - Complementarity of the participants within the consortium (when relevant) - Appropriateness of the management structures and procedures, including risk and innovation management

Key factors

- **Define the state of the art**: What do suppliers already have? What is under development in ongoing R&D projects? What are most advanced solutions already deployed or under development
- **Credibility of the proposed approach**: Proposed approach/methodology to achieve the project objectives, Proposed lead procurer, buyers group, (third parties), (members sole participant)
- **Preparation phase**: market consultation, development common specs & evaluation criteria
- **Implementation phase**: scope procurement, expected output, duration, budget, approach for joint evaluation offers (external experts or not, draft evaluation criteria), monitoring progress suppliers
- **Expected impacts** :Reducing fragmentation of demand for innovative solutions, Improving competitiveness and growth of companies via development of innovations meeting needs of European and global procurement mkt

Key factors

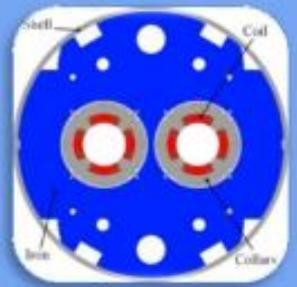
- **Measures to maximise impact**: Demand side measures to encourage wide deployment of solutions, Plans to deploy and encourage other procurers to deploy solutions, Ways in procurement approach itself (e.g. KPIs) to maximise impact, IPR arrangement

- **Project plan**: Work plan with work packages, deliverables, milestones (follow templates) Work Packages (foresee separate work packages for), Resources to be committed, How will consortium mobilise resources for project, cost of personnel

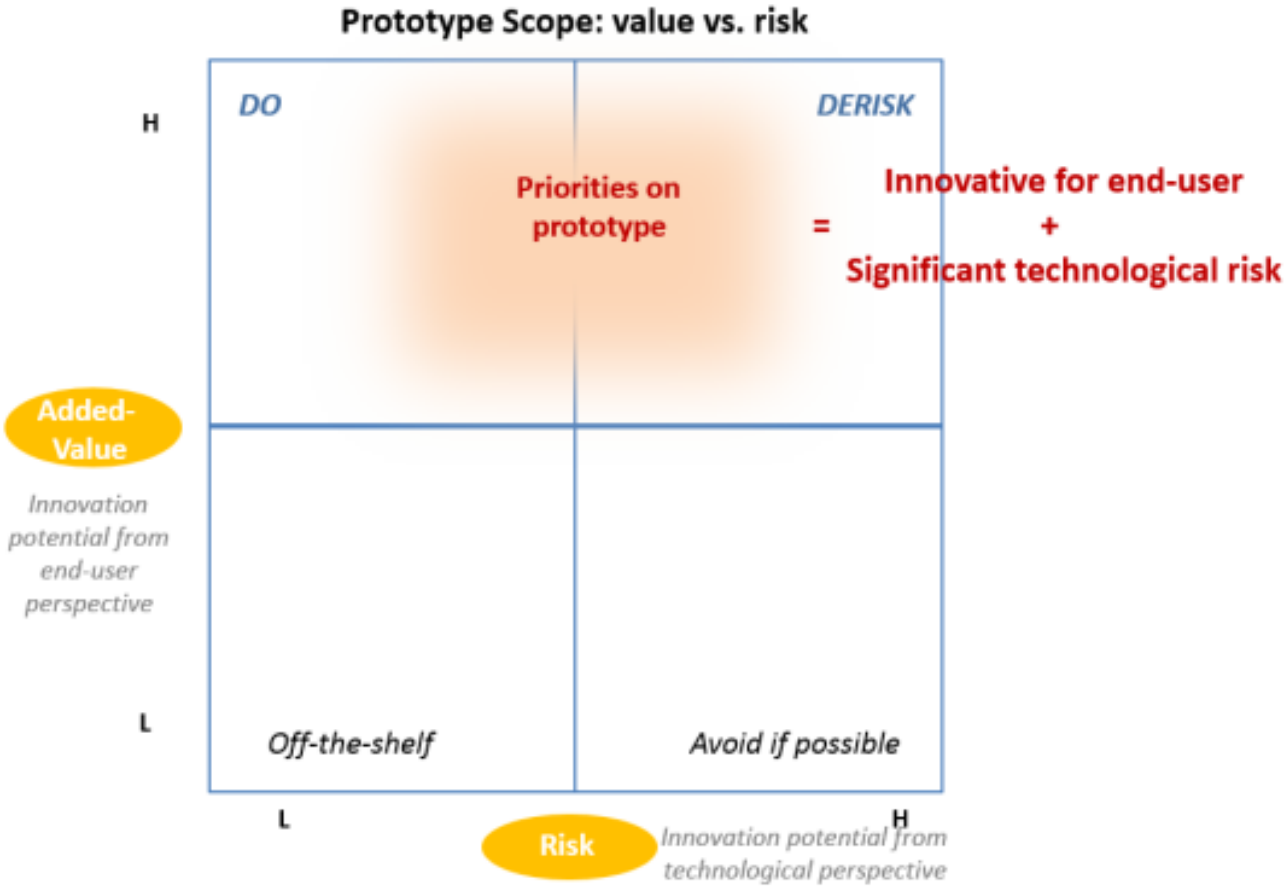
- **Consortium management:** Preparation stage, Procurement/tendering stage, Contract implementation stage Management plan and decision making procedures, Organisational structure and decision making mechanisms governance, conflict resolution

- **Communication and dissemination**: At the end of action: assessment of validation of solutions resulting from PCP/PPI + demonstration of solutions to Commission

PCP Steps

Preparation Phase	Market consultation	Pre-commercial Procurement	Commercial Tender
			

What you have to take into consideration



Open Market consultation

Sessions with representative stakeholders - Active participation – Concrete technological questions and challenges – Profile of the participants

0	**No worries, of-the-shelf standard solutions exist.**
2-3	**A frequent problem**, potentially some hazardous cases, but certainly solvable.
13	**Absolutely not a standard problem.** A solution requires important choices, thorough elaboration, and specific expert effort. Success can be achieved with significant time and effort.
100	**Impossible**, requires physical laws breakthroughs .
?	**Doh t know**, no experience with this subject.

QUACO Open Market consultation

QUACO QUAdrupoleCOrrector

Home | QUACO in a nutshell | Acquisition Timeline | Events | Results | Contact

OPEN MARKET CONSULTATION

OMC QUACO - 30 Mar (CERN)

- Official Site
- Program

Open Market Consultation

The QUACO Open Market Consultation has been held at CERN on 30 March 2016. Leading companies in the field of magnet production attended this event organized by CERN and its partners (CEA, CIEMAT & NCBJ), the Consortium that is acting as a single buyer group in the QUACO Pre-commercial Procurement (QUACO PCP). The main aim of this event was to inform and prepare the companies for the upcoming call for tender that is foreseen in May 2016, as well as to gather feedback and suggestions from potential bidders.

The morning session included a series of presentations that provided an overview of the QUACO project and the consortium, the pre-commercial procurement process, and the objectives of the procurement activity. The scope of the presentations went from technical aspects -current status of the Q4 magnet, its technical scope and requirements- to more legal and administrative matters, such as the legal and contractual framework in which the

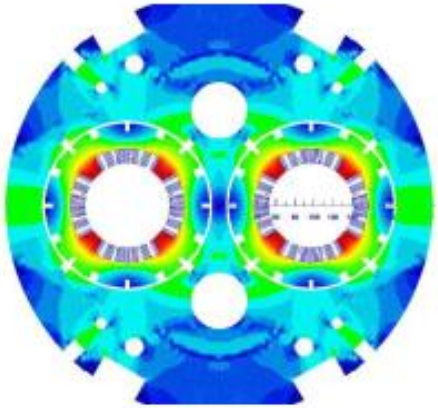
QUACO Open Market consultation

- 8 companies were registered and participated in the event;
- 13 participants were connected via webcast;
- 11 CERN participants attended the event;
- 16 participants from companies attended the event;
- 7 participants from Consortium partners attended the event.

Strong interest from the industry

QUACO Phase 1: Solution design

- Conceptual designs of the tooling and of the magnet are expected including:
  - A preliminary magnetic design;
  - A conceptual design of the support structure consisting of finite element analysis and CAD models;
  - Conceptual designs of the coil fabrication tooling and of the magnet assembly and support tooling.
- A preliminary top level manufacturing and inspection plan.



Magnetic field in return side head of the coil (Elytt)

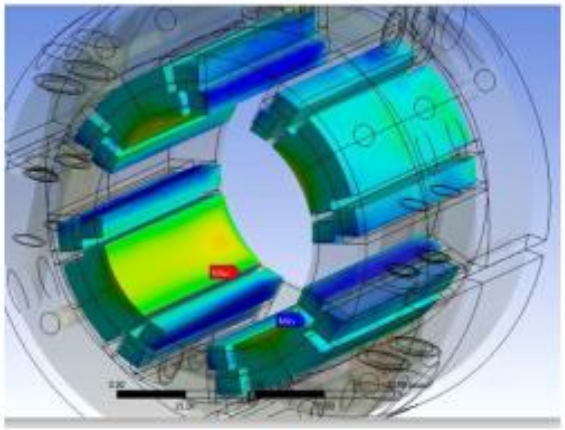
QUACO Phase 2: Detailed Engineering Design

Final coupled magnetic and mechanical design;

Final CAD models of the magnet and its components and of all the related tooling;

A final manufacturing and inspection plan including assembly and fabrication procedures;

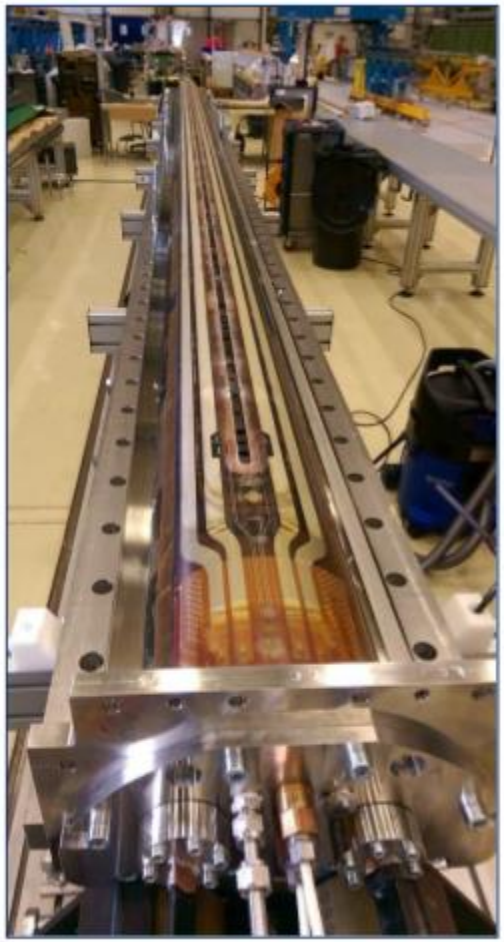
Mock-ups and associated tooling.

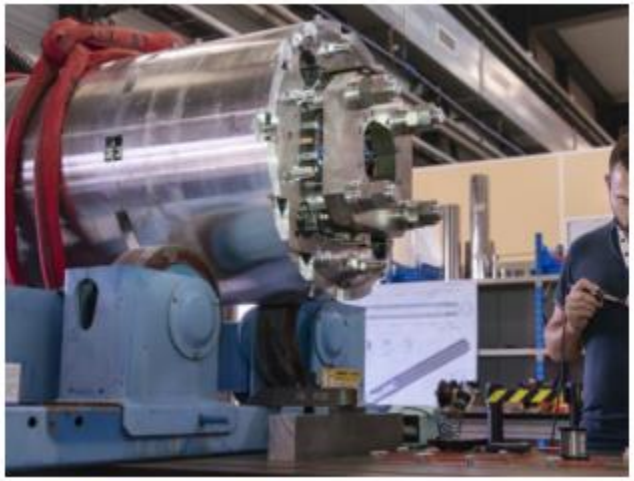


Mechanical Design
(Sigmaphi)

Bladder and Keys
Mock-up (ANTEC)

QUACO Phase 3: First of a kind magnet

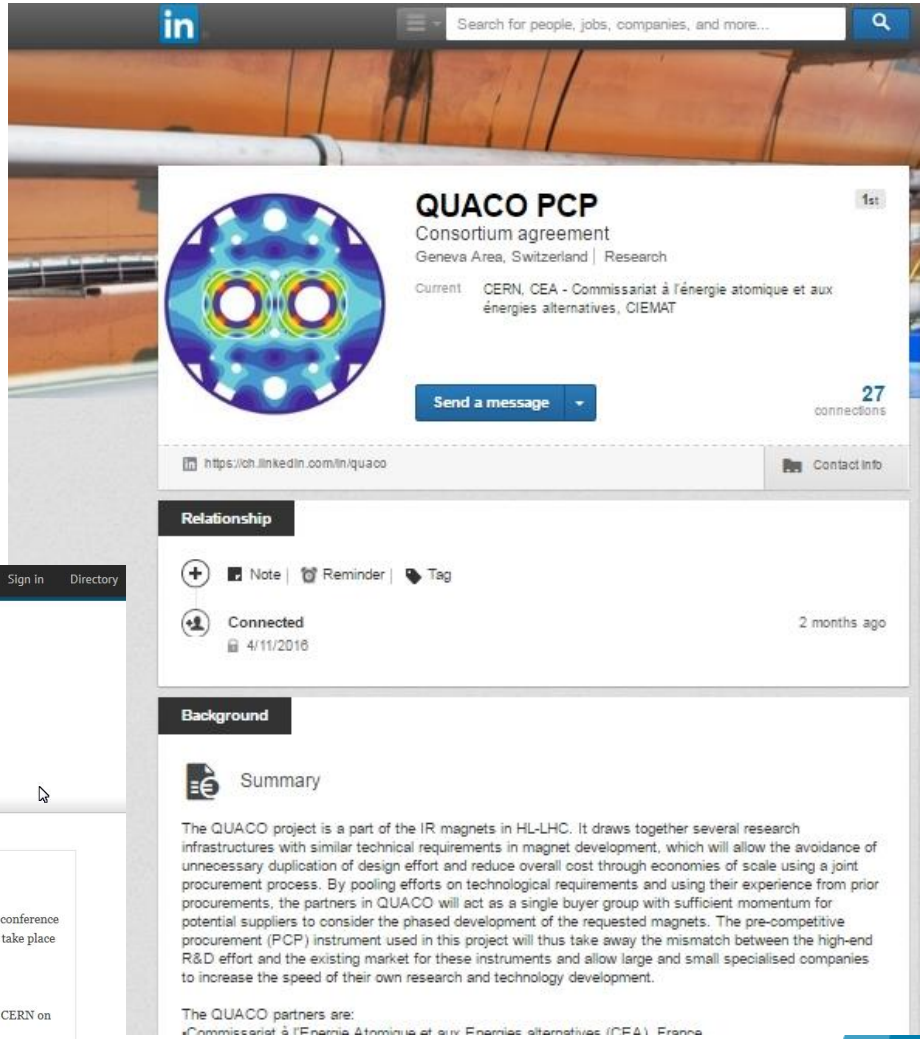


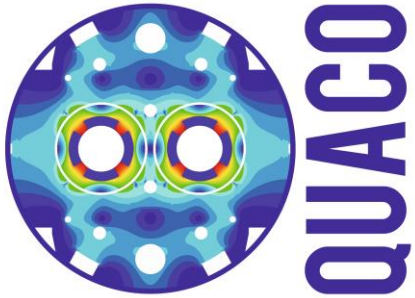
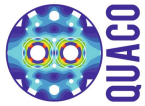


PCP Mechanism

- Reduces strongly the financial risk for the company as the development costs are covered by the EU and the buyers group
- The multi phases allows progressive ramp up of resources
- Allows an easy transfer of knowledge and patents
- Development is driven by needs and by a first group of buyers
- A great opportunity for SMEs!!!!

To know more follow us





PCP is a great tool for innovation