

Report of the Working Group on Innovation to the ESFRI

The access to research facilities

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de l'Enseignement Supérieur et de la Recherche**

Direction Générale de la Recherche et de l'Innovation (DGRI)



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MINISTÈRE
DE L'ENSEIGNEMENT SUPÉRIEUR
ET DE LA RECHERCHE



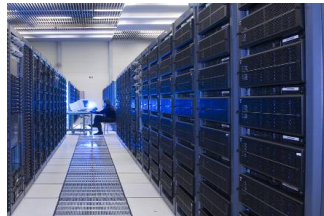
European definition of research infrastructures 2015 (H2020)

Research infrastructures are facilities, resources and services that are used by the research communities to conduct research and foster innovation in their fields. Where relevant, they may be used beyond research, e.g. for education or public services.

Knowledge-based resources

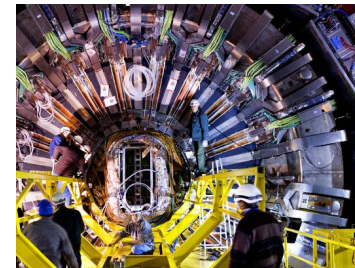


e-infrastructures



Environmental networks

Major scientific equipments



...to achieve excellence in research and innovation.



Research Infrastructures

Access to what ?

Access to unique instruments and sites

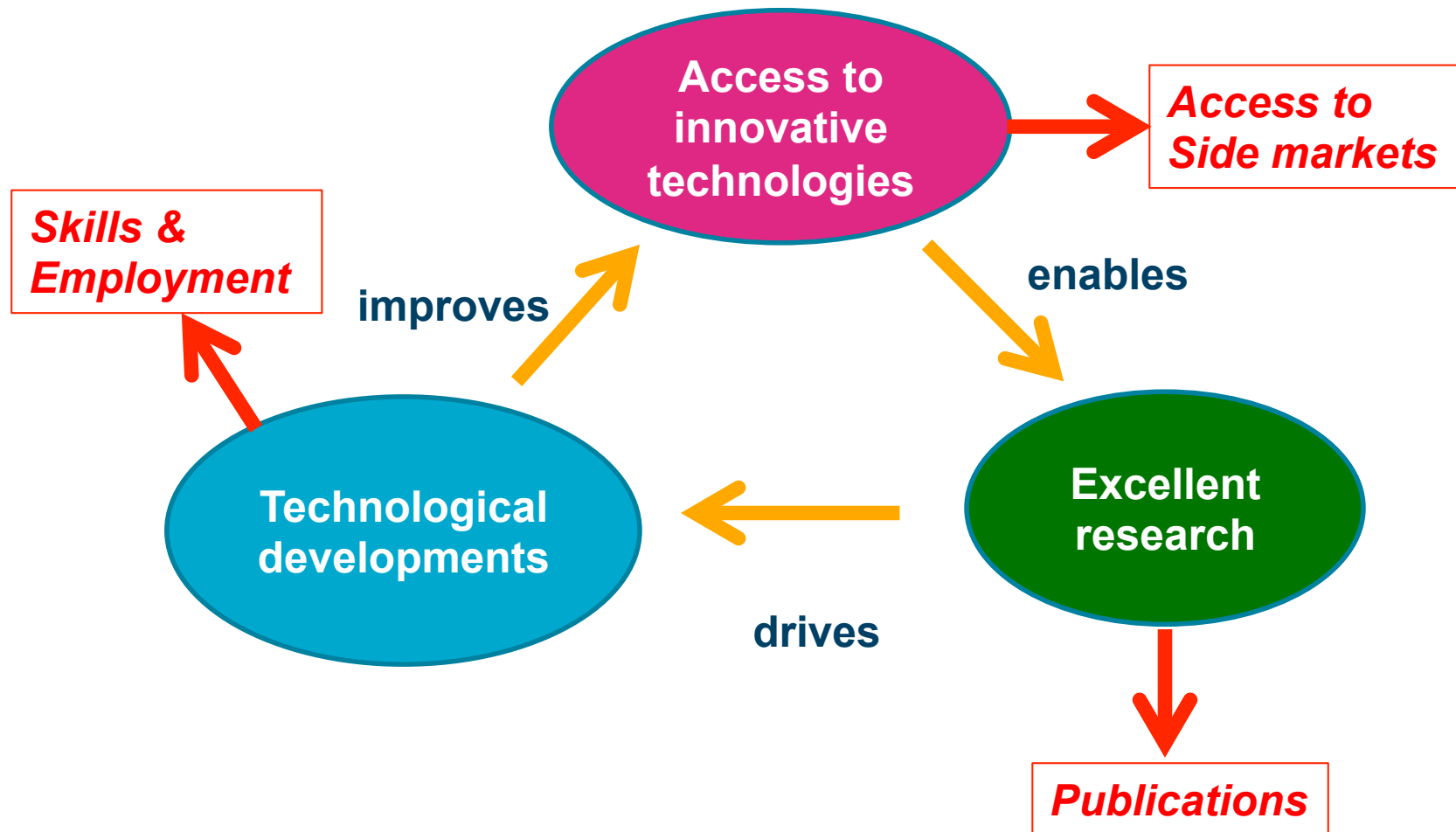
Access to data

Access to manufacturing/fabrication

Access to services



Analytical Research Infrastructures host a virtuous innovation cycle for enhancing their up-to-date instruments





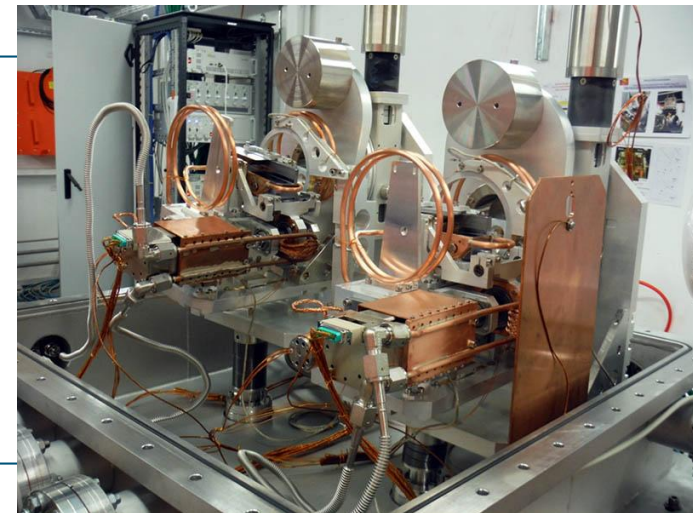
What are we talking about ?

- => Innovations related to the RI process itself*
- => An unbelievable level of requirements
(at the uppermost limits of the physic's possibilities)*



A procurement market of about 3b€/y for Europe (ERID-Watch, 2009)

“RIs are at the time process’ providers but are also compulsive buyers of technologies”





Structure/organisation/objectives

- Born in 2002 (post-Lisbon)
- Intergovernmental structure
- Elaborate the list of pan-european RIs for the 21st century
- 2 delegates by MS+associates ; 6 sessions/y; 6 Strategic WG
- https://ec.europa.eu/research/infrastructures/index_en.cfm?pg=esfri

Deliverables

- 3 initial Road-maps(2006, 2008, 2010) + a first revision (2016)
- 48 (+3 CERN) projects from the origin (2010)
- ERIC statute (2009); similar to a JU (11 promulgated, ~12 on going)
- European Charter for RI access (2015)
- Specific WG: ***innovation (2015)***, long-term sustainability of RIs (2017)

Current situation

- Up-date of 2016 : 29 Landmarks (out-up), 4 withdrawals (out-down), 6 new
- Next revisions in 2018 and probably in 2020

Working Group on Innovation

- Set-up by ESFRI in 2013

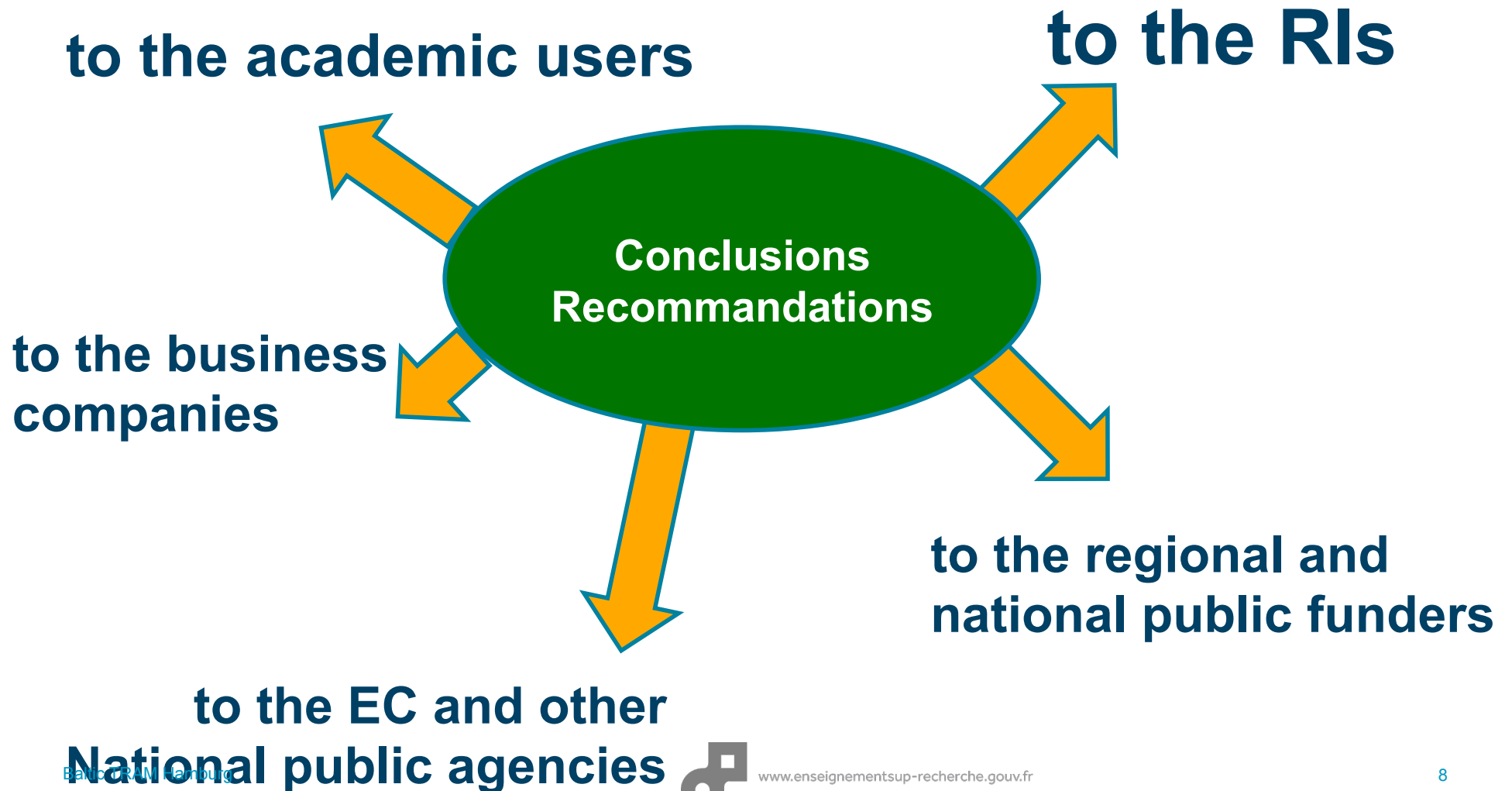
Objectives

- To identify and promote the innovation and industrial capabilities of the RIs on the ESFRI Roadmap
- To strengthen the cooperation of pan-European RIs with industrial suppliers
- To promote the access of industrial users to the RIs

Specific tasks

- Propose solutions to the problems of dissatisfying RI-industry interactions (especially with industrial suppliers)
- Explore the major obstacles for enterprises to use publicly owned RIs

To which recipients ?



WARNING:

The following recommendations were made to the attention of all members of ESFRI. It may be necessary to apply them with discretion in a particular European country, according to its own existing organization in the field.

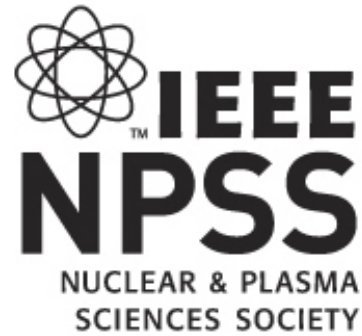
Recommendations (1)

Working Group on Innovation

RIs and Funding Agencies (including the EU) to raise awareness and improve information dissemination

- Support the installation of **Industrial Liaison Officers (ILO)** in RIs
- Raise awareness on RI access and services for industry with a **European-wide portal** :
 - Highlight the access modes and collaborative regimes
 - Inform industry on prices and IPR conditions
- Publish by advance **information on (future) Calls for Tenders**, RI needs and TT opportunities, and upcoming procurements

Multiply the exchanges' fora ?



CERN KT



ESS ILO Meeting



portals



Recommendations (2)

Working Group on Innovation

RIs and Public Authorities to improve industrial access

- RIs to establish a **Quality Chart** on access which would meet the expectations of the users
- RIs to develop **remote control access and virtual use of the facilities**
- Promote **programme-based access open to long-term projects** funded by research agencies, regional competitiveness clusters and/or private companies as an **intermediate access mode** between the strict scientific merit-based access and the proprietary access



Access conditions to analytical facilities: a room for collaborations on a longer term

TRL2 to 3

Free access based
on scientific
excellence
Peer review committee
Obligation to publish in
scientific reviews
**Delays sometimes
important**

Open publication

TRL 4 to 6 ?

Free access to labs
under contracts
with companies
(20 to 30%)
**Access
to projects
already funded
by public agencies ?**

?

TRL 7 to 8

Paying access
Less delays
**Less scientific
evaluation**
Confidentiality
Ownership of the results

Private ownership

Towards « win-win-win » arrangements ?

Recommendations (3)

RIs to improve their managerial tools

- RIs and the Funding Agencies to develop skills in **support to the value analysis specialized in RIs** (fast market studies, research of potential companies for taking over additional developments)
- Encourage the adoption of analytical accountability practices for the facility management in order to facilitate the **elaboration of realistic and reliable operation costs**

Recommendations (4)

Working Group on Innovation

RIs to develop business-oriented activities and services

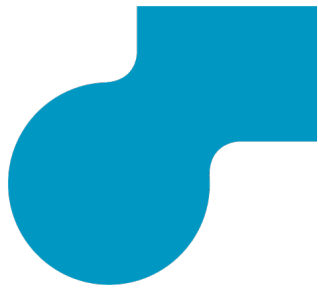
- Develop more business-oriented activities and, where appropriate, the installation of a **Techno-Transfer-Office**
- Promote the skills for assessing and protecting inventions (staff interest)
- **Provide companies (including SMEs) with new or more extended room near RIs dedicated to pre-competitive research programmes**

Recommendations (5)

Working Group on Innovation

Increasing cooperation during construction/upgrade

- RIs and the relevant Authorities **to support the pre-development of highly innovative components** supposed to be purchased by a large number of facilities
- RIs **to define Strategic Roadmap Agenda of key-technologies** for the R&D and the construction of future (global) RIs
- More generally, **develop new modes of collaboration between RIs and with industrial companies**



A Pilot Initiative for the WP 2018-2020 ?

International context of new R&D horizons (space, oceans' bottom, physics, deep earth)

- global machines, global networks (climate, energy, agronomy)
- globalisation beyond the BRICS = more calls for equipment in overseas areas

=> A platform-like structure could prepare our industrial networks of SMEs and majors to these opportunities (AAA model in Japan?)

EAG (Expert Advisory Group of the EC)

“The RI potential of innovation is largely untapped, due to the lack of a corresponding eco-system at the European scale, which needs to include also the private sector “

“A pilot initiative in the 2018-2020 WP could address technologies development in and/or for RIs, and would enable to test their effective innovation potential... “

Recommendations (6)

Working Group on Innovation

RIs and Public Authorities to develop industry and innovation oriented funding streams, programs and structures

- Develop dedicated funding stream for KT and TT at the most appropriate level (regional, national or even European)
- Provide companies (including SMEs) with new or more extended room near RIs dedicated to pre-competitive research programs
- **Promote the development of local or regional ecosystems integrating RIs, T-Infrastructures, Technology and Service Providers, Incubation Facilities and Industrial Users**, namely an environment opening new opportunities for hosting projects with industry and where the added value offered by RIs and their complementarity with industry can be optimized (in scientific campuses, technology parks, etc.). Extend the perimeter of the innovation ecosystems to new industrial partnerships, other than spin-offs and start-ups



The T-Infrastructures concept: the “SYNERGIUM” platform at CEA-Saclay

25 000 m² of High-tech technological platforms

(high-intensity sources, RFQ and injectors, superconducting cavities, superconducting magnets, cryomodule test-beds, instrumentation...)

100 M€ of investments in R&D, integration and test platforms (in collaboration with CNRS) open to industry

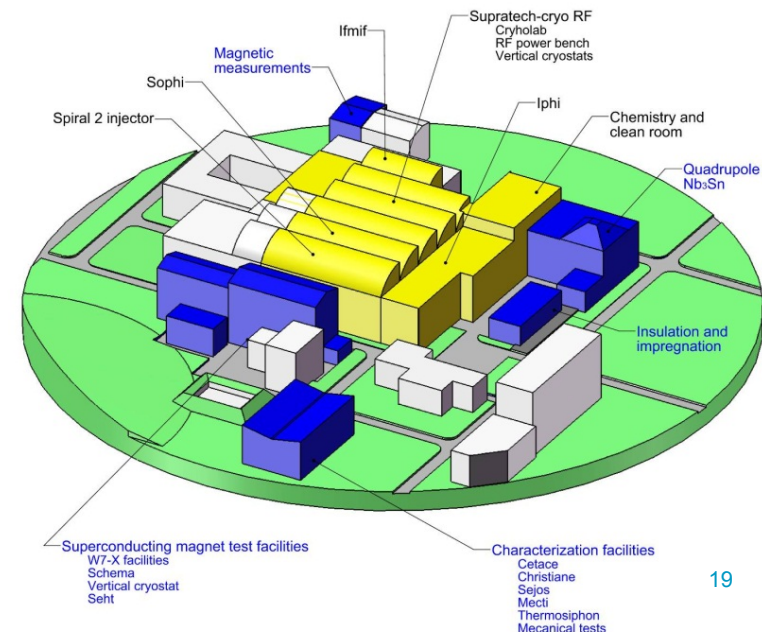
150 M€ of contracts in 5 years for the design and construction of RIs' components

(Iseult, Spiral2, FAIR, XFEL, ICOS, ESS, CERN, LNCMI, CTA, IFMIF, JT60-SA, W7X, LMJ, ESO, ESA...)

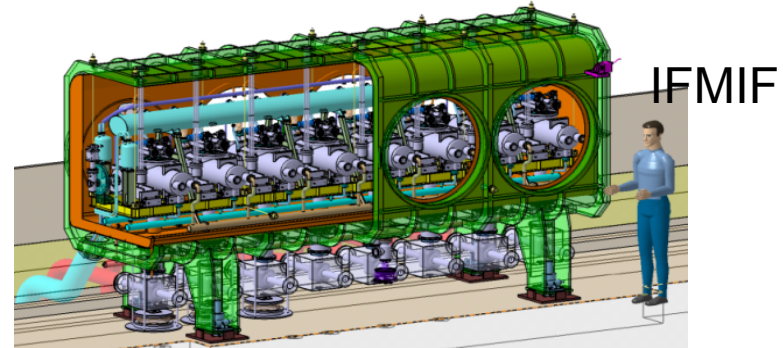
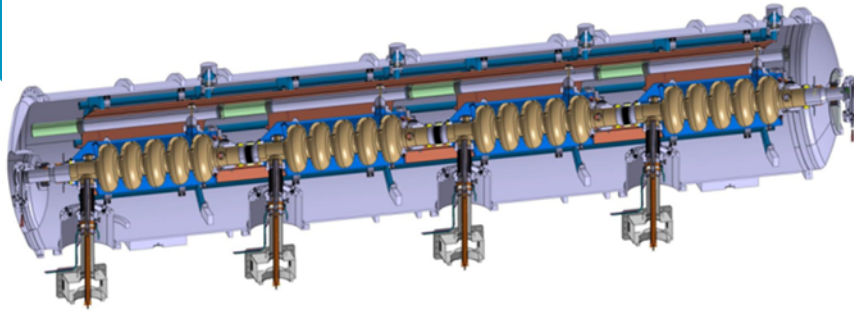
Objective : working time at ~50/50

- fabrication contracts (private operator)
- pre-development of future components

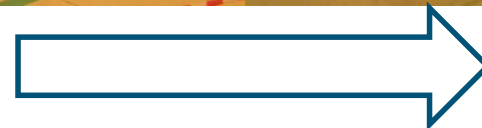
A “win-win” network of European labs and industries



Technological Infrastructures for integration: SPIRAL2, XFEL, ESS, IFMIF



12 cryomodules for Spiral2



103 cryomodules for XFEL

ALSYOM
ALCEN

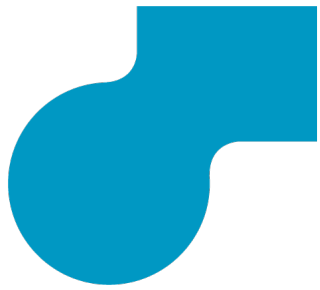
Recommendations (7)

Working Group on Innovation

The relevant Authorities (at the appropriate regional, national and European level) to enhance the regulatory environment

- **Improve the efficiency of IPR policies**
 - Develop methodologies rather than models
 - Share good practices

- **Encourage public procurement leverage effect (long-term markets)**
 - Simplify the procurement procedures and rules
 - Harmonize their transposition in all EU Members States
 - **Improve the involvement of industry in pre-commercial research and prototype development (PCP & PPI schemes).**



Some definitions...

PCP: pre-commercial procurement:

pay for R&D results (nothing on the market)

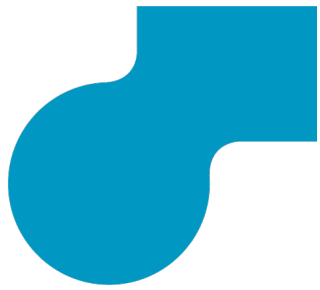
PPI: Public Procurement for Innovative solutions

pay for innovative products (almost / <2y on the market)
(don't pay for the development)

IP: Innovation partnerships (merging PCP & PPI):

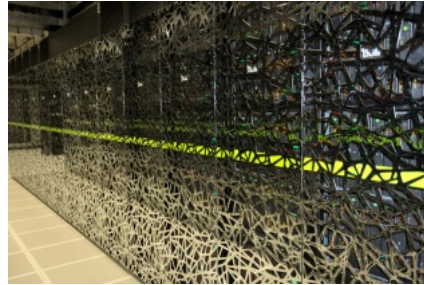
pay for R&D results and products (creation & market introduction)





RIs involved in PCP & IP in Europe...

PCP FP7: PRACE 3IP



PCP H2020 :

QUACO (CERN, CEA, ES, PL)

HELIX-NEBULA (CERN, CNRS, DESY, EMBL-EBI, ESRF, IFAE, INFN, KIT, SURFSara, STFC)



National PCP : ESS (Vinnova-SE)



French Innovation partnerships :

RESIF et CNRS

EMBRC/ Station de Villefranche sur mer et UPMC

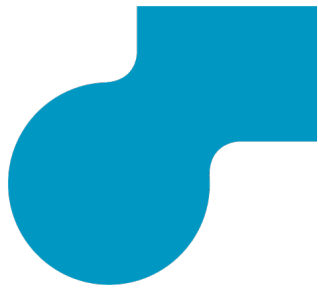


Recommendations (8)

Working Group on Innovation

The Authorities (at the appropriate regional, national , European level) to enhance the regulatory environment

- **A favourable political, regulatory, legal and financial environment is required for facilitating business for industrial suppliers** such as actions by the funding agencies and political authorities e.g. on public procurement policies, IPRs, the knowledge of RI markets, the rules regulating State aids, dedicated funding mechanisms, etc
- **Successful innovation requires conditions for facilitating innovative thinking and creative problem solving.** As such, RIs (whether distributed or single-sited) should adopt a program of self-assessment with "evolving through innovation" being the principal motive in carrying out such a process



A question of both culture and methodology

“How could we influence the culture of a RI so that it and its staff think of ‘innovation’ as an important part of its mission and seek opportunities for innovation with enthusiasm and ingenuity rather than doing so only because they believe it’s the politically correct or expedient thing to do ?”

Andrew Harrison (Diamond CEO)

Stop institutional incantations ?

- innovating no matter the cost ?

Believe in your serendipity capacities ?

Improve your basics in innovation

- regular practice of risk analysis ?

- move from a logic of excellence to a logic of value ?

- learn to know when a door must be open and when it must be closed ?

Conclusions (1)

A deep change of culture in both RIs & industry

- **Inform all stakeholders** on the potential for cooperation
- **Promote the intermediaries** and the specifically dedicated cooperation mechanisms and tools
- **Train a new generation of researchers**, more receptive to IPR issues and of industry needs, including mobility
- **Develop new large scale initiatives** to increase the attractiveness of RIs for industry and the preparation of next global challenges

Conclusions (2)

The development of new ecosystems of innovation

- **Promote more extensive partnerships** on joint R&D projects and cooperative programs developing advanced technologies
- **Enhance the regulatory environment** (PCP, PPI, local tax, etc)
- **Offer companies the immersion in active ecosystems of innovation** based on a complementary broad range of competences and skills
- **Install definitely the concept of "industry as a full partner"** (both as a supplier and as a user)
- **Exploit the "business at walking distance" advantage**

Thank you for your attention !

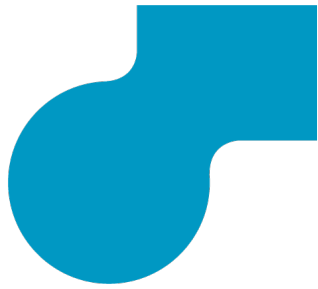
The Middle-Age abbey-libraries were centers of theological research, agronomic knowledge and technology transfer and became the cultural roots of Europe.



www.alamy.com - D88DF0



Why the RIs of the 21th century shouldn't play this role for the ERA ?



That 'co-innovate' means...

Co-submit applications ?

Co-respond to overseas calls ?

Co-fabricate components ?

Co-own IPR, patents, prototypes ?

Co-develop software and technologies ?

Co-operate platforms ?

Co-train and co-employ technical staff ?

Co-design future components ?

Co-fund joint « private » developments ?

Co-construct a reciprocal confidence ?

*"Coming together is a beginning. Keeping together is progress.
Working together is success "* **Henry Ford**