



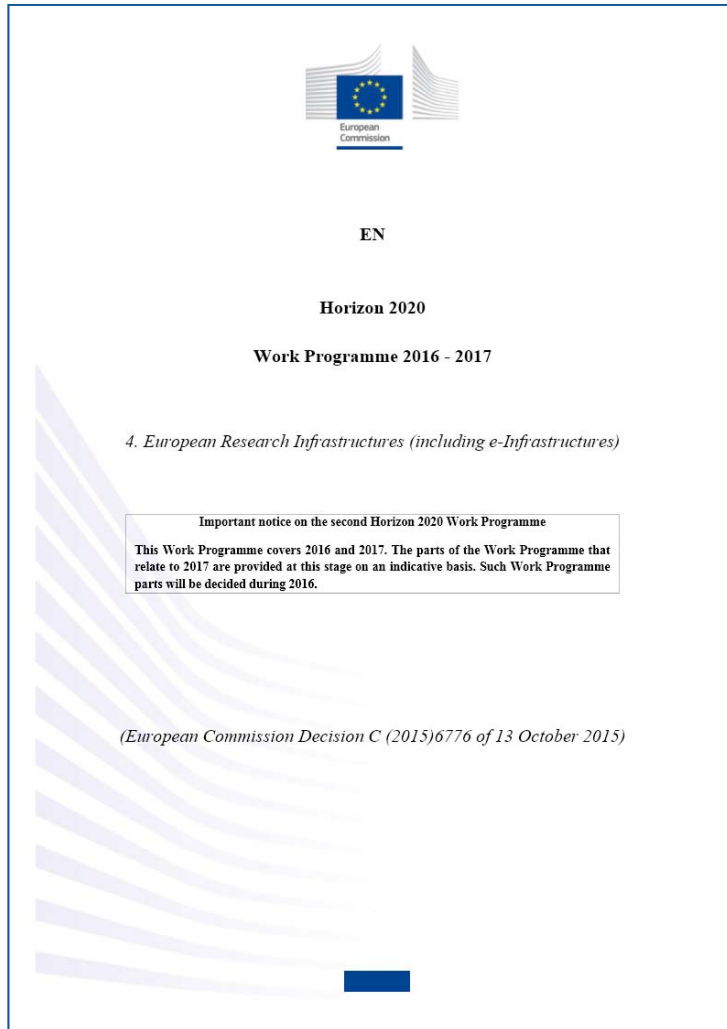
Horizon 2020

Research e-Infrastructures Excellence in Science Work Programme 2016-17

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DG CONNECT

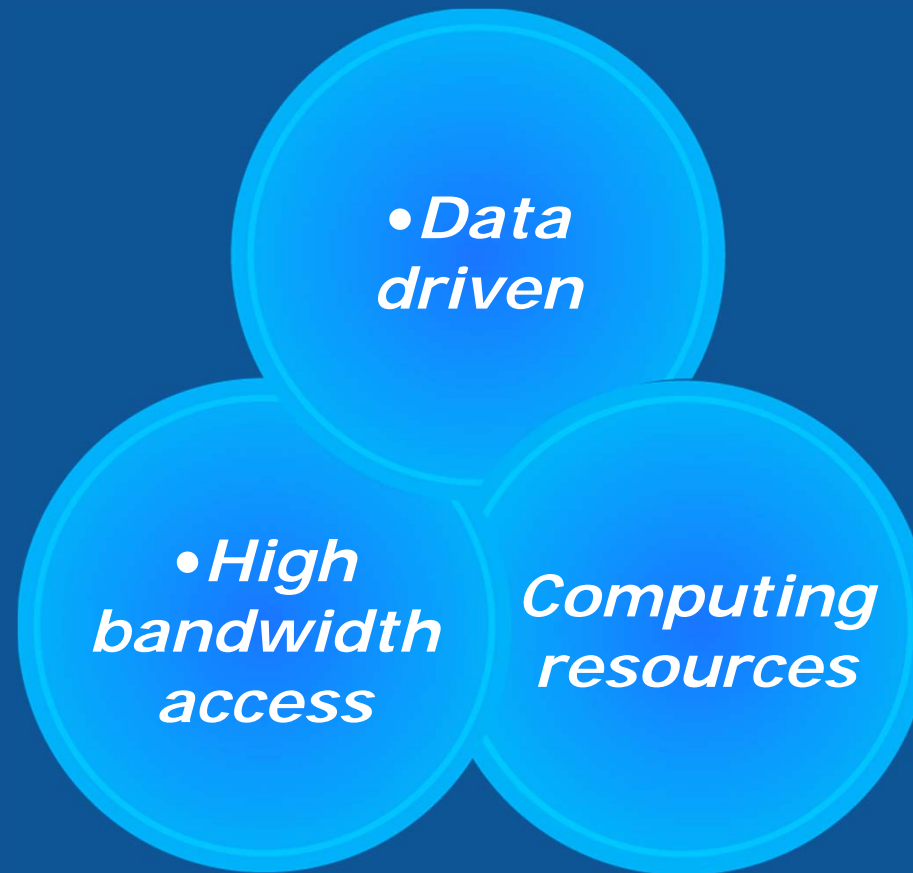
European Commission



Before we start ...

The material here presented has been compiled with great care for explanatory purposes, however the work programme document approved by the European Commission is the only valid legal reference

What is research about today?





e-Infrastructures supporting every researcher becoming digital

The way forward on e-Infrastructures

- From "operation centric" to "user centric"
- From "technology offer" to "service offer"
- Fostering long-term sustainability through:
 - ✓ Service reliability
 - ✓ Continuous Innovation
 - ✓ International Cooperation
 - ✓ Open Research Data
 - ✓ Horizontal support of cross-cutting initiatives



E-INFRASTRUCTURE SERVICES ENABLE THE OPEN SCIENCE VISION

**Open
research data**

**Data and
computing
intensive
science**

**Research and
education
networking**

**High
performance
computing**

**Big data
innovation**



Implementation Principles

- **Service orientation**
 - Catalogue of services
- **Maximizing and assessing the impact of e-Infrastructures**
 - Use of **KPIs** for operational, technical and socio-economic impact assessment
- **Participation in international fora such as the Research Data Alliance (RDA)**
- **Innovation through co-design**
- **Open research data**
- **Horizon 2020 as a catalyst for growth and jobs**



e-Infra WP2016-17 consists of 3 themes

**Integration and
consolidation of
e-infrastructure
platforms**

**Prototyping
innovative e-
infrastructure
platforms and
services**

**Support to
policies and
international
cooperation**



Theme 1 - Integration and consolidation

Covers

- **Coordination** of **operations** and funding (regional, national & European levels)
- Exploiting **synergies** between operational e-Infrastructures
- Continuous **upgrades** of infrastructure without service disruption

Features

- TRL8 or above
- Transnational and virtual access cost reimbursement
- Documentation of services on an open **Service Catalogue**
- Services to be assessed by an **external board** (approved by the EC)
- Projects to conclude **written** collaboration agreements

Topics

- EINFRA-11-2016, EINFRA-12-2017 and EINFRA-8-2014 (GEANT)



Theme 2 – Prototyping innovative platforms and services

Covers

- **Evolution** through **innovative actions**
- **Platform-driven** innovation. **Push** from the supply side
- **User-driven** innovation. **Pull** from the demand side

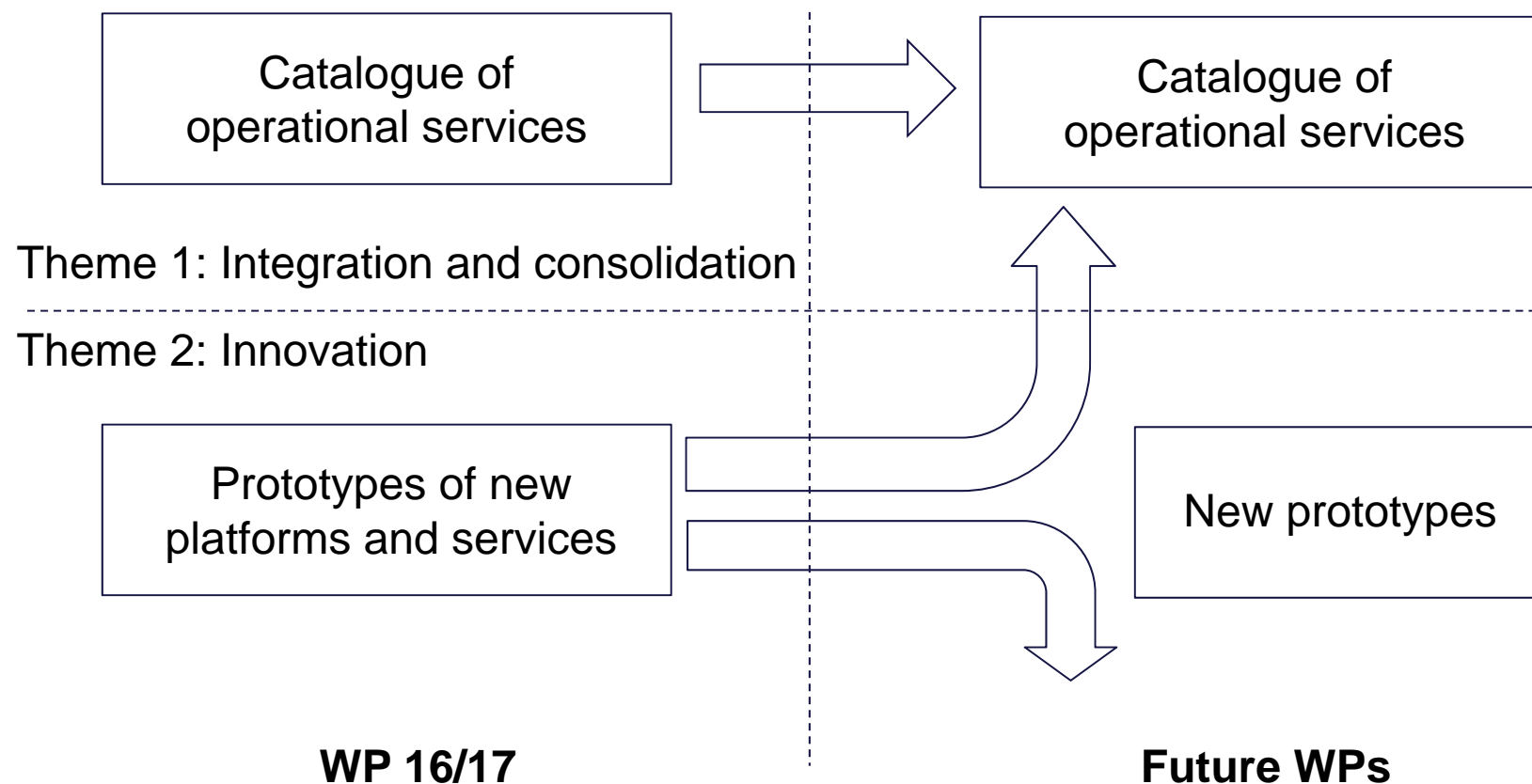
Features

- TRL6 at the beginning of the project; (at least) TRL8 by the end (except PPI actions)

Topics

- EINFRA-21-2017, EINFRA-22-2016, EINFRA-8-2014 (GEANT) and FETFLAG-1-2014 (Human Brain Project)

Interplay between theme 1 and theme 2: a dynamic view of WP 16/17





Theme 3 – Policies and international cooperation

Covers

- European support to the Research Data Alliance, RDA
- Support to data dissemination and international cooperation in the context of the Square Kilometre Array project
- International Co-operation on e-infrastructure supporting major societal challenges
- Support to the e-IRG secretariat
- Support to dissemination for the e-infrastructure programme
- Support to small-size foresight roadmaps for the e-infrastructure programme

Topics

- INFRASUPP-03-2016, INFRASUPP-02-2017 (3), INFRASUPP-03-2017



Conditions applicable to all e-Infrastructure projects: **part D of the section “Specific features for Research Infrastructures” p.74-77**

- Proposals shall consider **existing operational** services to the greatest extent possible to use or extend them
- All proposals are requested to suggest clear metrics (**KPIs**) for monitoring results and impact
- All services developed should be made discoverable on-line by including them in searchable **catalogues** or digital registries
- All software developed should be **open source** with appropriate licenses
- Theme 1 (**Integration**): Focus on (i) Networking & (ii) Service activities
- Theme 2 (**Innovation**): (i) Networking, (ii) Service & (iii) Joint Research Activities (JRA)



Networking Activities (non-exhaustive list)

Aiming to foster a culture of co-operation between project stakeholders but also with other related projects.

- Joint management of service provision and **pooling** of distributed **resources**.
- **Dissemination** of project results and **knowledge**, contribution to innovation
- Reinforcing **partnership with industry**, involvement of industrial associations in consortia
- Definition of common standards, protocols and **interoperability**; benchmarking
- Exchange of personnel and **training** of staff
- Definition of **data management** plans
- Coordination with national or international related initiatives



Service Activities (non-exhaustive list)

Based on at least **TRL 8** systems & technologies

Adequate description of the services provided in the form of a **catalogue of services** (for theme 1)

Compliant with the **model of Trans-national and virtual access costs** (for theme 1)

- **Procurement** & upgrading of infrastructure, operations and end-to-end services
- Services deployed on top of generic infrastructures to serve **virtual communities** in the various scientific domains
- Support of **middleware** component repositories
- Data and resources management .
- Foster the effective use of distributed supercomputing facilities; **federation of services** and wide use of digital repositories
- **Vertical integration** in support of specific virtual research communities



Joint Research Activities (non-exhaustive list)

Innovative activities to explore new fundamental technologies or techniques, which have already reached **TRL 6**, targeting TRL 8.

Should involve, whenever appropriate, industrial partners and **SMEs** to promote innovation.

- Higher performance methodologies, protocols and instrumentation
- Innovative solutions for data collection, management, curation and annotation;
- Introduction of new end-to-end services (dynamic allocation of resources and innovative accounting management);
- Novel solutions driving the emergence of high level interoperable services;
- Innovative software solutions for making new user communities benefit from computing services.

Budget overview

Topic	Budget (M€)
Theme 1 - Integration and consolidation of e-infrastructure platforms supporting European policies and research and education communities	(55)
EINFRA-1.1-2016 - Support to the next implementation phase of Pan-European High Performance Computing infrastructure and services (PRACE)	15
EINFRA-1.2-2017 - Data and Distributed Computing e-infrastructures for Open Science	40
Theme 2 - Prototyping innovative e-infrastructure platforms and services for research and education communities, industry and the citizens at large	(67)
EINFRA-2.1-2017 – Platform-driven e-infrastructure innovation	46
EINFRA-2.2-2016 – User-driven e-infrastructure innovation	21
3 - Support to policies and international cooperation	(10)
INFRASUPP-02-2017 Policy & Cooperation measures for research Infrastructures	2,5+1*
INFRASUPP-03-2016 Support to policies and international cooperation	7,5
Other actions including different type of instruments:	
(a) FPA - GÉANT Partnership Projects	(64)
(b) FPA - Computing and storage e-infrastructure for the Human Brain Project FET Flagship (FPA)	(25)
Total	221

e-Infrastructures WP2016-17 (Chronological view)



TOPIC	Title	Category	Budget Split	Type of Action	Open Date	Deadline	Budget	Recommended proposal budget
EINFRA-11-2016	Support to the next implementation phase of Pan-European High Performance Computing infrastructure and services (PRACE)	HPC & PRACE	HPC & PRACE	RIA	08/12/2015	30/03/2016	€ 15M	-
EINFRA-22-2016	User-driven e-Infrastructure Innovation	Exploitation of e-infrastructures for user-driven innovation and pilots responding to community specific challenges	Societal Challenges	RIA	08/12/2015	30/03/2016	€ 21M	€2M - €3M
			Innovative Actors (SME)	RIA				€5M - €6M
		pan-European ID Federation	RIA	€2,5M - €3M				
		Innovation for Open Science e-infrastructures and services	Support services for Open Science	RIA				€1M - €2M
INFRASUPP-03-2016	Support to policies and international cooperation for e-infrastructures	Research and Innovation Actions for International Co-operation on high-end e-infrastructure requirements	Square Kilometre Array	RIA	08/12/2015	30/03/2016	€ 4,5M	€ 3M
			Coordination and Support actions for international co-operation and policy development	International Co-operation on e-infrastructure supporting major societal challenges				CSA
		Policy support to e-infrastructure programme (e-IRG)		CSA				€0,5M - €1M
		Support to dissemination for the e-infrastructure programme		CSA				€1M - €1,5M
		Support to small-size foresight roadmaps for the e-infrastructure programme	CSA	€300K - €400K				
EINFRA-21-2017	Platform-driven e-Infrastructure innovation	Public Procurement of innovative HPC systems	Procurement	PPI	14/04/2016	20/09/2016	€ 26M	-
		Research and Innovation Actions for e-Infrastructure prototypes	Universal discoverability of data objects and provenance	RIA	08/12/2016	29/03/2017	€20M	€4M - €5M
			Computing e-infrastructure with extreme large datasets	RIA				€2,5M - €3M
EINFRA-12-2017	Data and Distributed Computing e-infrastructures for Open Science	Secure and agile data and distributed computing e-infrastructures	"European Open Science Cloud for Research" (Related to INFRADEV-4-2016)	RIA	08/12/2016	29/03/2017	€ 40M	€10M - €15M
		Access and preservation platforms for scientific information	Open Access	RIA				€8M - €10M
INFRASUPP-02-2017	Policy and international cooperation measures for research infrastructures	RDA Support	RDA Support	CSA	08/12/2016	29/03/2017	€ 3,5M	€3M - €3,5M

e-Infrastructures WP2016-17

(Topic view)



	TOPIC	Title	Category	Budget Split	Type of Action	Open Date	Deadline	Budget	Recommended proposal budget	
Theme 1	EINFRA-11-2016	Support to the next implementation phase of Pan-European High Performance Computing infrastructure and services (PRACE)	HPC & PRACE	HPC & PRACE	RIA	08/12/2015	30/03/2016	€ 15M	-	
	EINFRA-12-2017	Data and Distributed Computing e-infrastructures for Open Science	Secure and agile data and distributed computing e-infrastructures	"European Open Science Cloud for Research" (Related to INFRADEV-4-2016)	RIA	08/12/2016	29/03/2017	€ 40M	€10M - €15M	
			Access and preservation platforms for scientific information	Open Access	RIA				€8M - €10M	
Theme 2	EINFRA-21-2017	Platform-driven e-infrastructure innovation	Public Procurement of innovative HPC systems	Procurement	PPI	14/04/2016	20/09/2016	€ 26M	-	
			Research and Innovation Actions for e-Infrastructure prototypes	Universal discoverability of data objects and provenance	RIA	08/12/2016	29/03/2017	€20M	€4M - €5M	
				Computing e-infrastructure with extreme large datasets	RIA				€2,5M - €3M	
	EINFRA-22-2016	User-driven e-Infrastructure Innovation	Exploitation of e-infrastructures for user-driven innovation and pilots responding to community specific challenges	Societal Challenges	RIA	08/12/2015	30/03/2016	€ 21M	€2M - €3M	
				Innovative Actors (SME)	RIA				€5M - €6M	
				pan-European ID Federation	RIA				€2,5M - €3M	
				Innovation for Open Science e-infrastructures and services	Support services for Open Science				RIA	€1M - €2M
Support Actions	INFRASUPP-02-2017	Policy and international cooperation measures for research infrastructures	RDA Support	RDA Support	CSA	08/12/2016	29/03/2017	€ 3,5M	€3M - €3,5M	
	INFRASUPP-03-2016	Support to policies and international cooperation for e-infrastructures	Research and Innovation Actions for International Co-operation on high-end e-infrastructure requirements	Square Kilometre Array	RIA	08/12/2015	30/03/2016	€ 4,5M	€ 3M	€1,5M - € 3M
				International Co-operation on e-infrastructure supporting major societal challenges	CSA				€0,5M - €1M	
			Coordination and Support actions for international co-operation and policy development	Policy support to e-infrastructure programme (e-IRG)	CSA				€0,5M - €1M	
				Support to dissemination for the e-infrastructure programme	CSA				€1M - €1,5M	
				Support to small-size foresight roadmaps for the e-infrastructure programme	CSA				€300K - €400K	

e-Infrastructures WP2016-17

Other Actions



Title	Budget Split	Type of Action	Time frame	Budget
GÉANT - FPA	Research and Education Networking	SGA	Q1-2016	€ 64M
	Trans-Atlantic submarine cable	SGA	Q1-2016	
Interactive computing e-Infrastructure for the Human Brain Project FET Flagship	The Human Brain Project	SGA	Q1-2017	€ 25M



Synergies with other parts of the Research Infrastructures Workprogramme

INFRADEV-04-2016: European Open Science Cloud

Links with related national initiatives and projects from
EINFRA-12-2017 should be established



Further information and additional resources



Information Day

Information Days on Horizon 2020 Research Infrastructures Work Programme 2016-17 with focus on e-Infrastructures:

Place: Meeting Room AB 0A,
Borschette Building
36 rue Froissart, Brussels

Date: **30 Nov 2015**

Time: **13h30* – 18h30**

Registration: <https://ec.europa.eu/digital-agenda/en/news/information-day-horizon-2020-research-infrastructures-work-programme-2016-17>

*Registration starts at 12h30



The Digital4Science platform

www.ec.europa.eu/d4science



#D4Science

@ICTscienceEU

@FET_EU

@FETflagships

@eInfraEU

The screenshot shows the Digital4Science website interface. At the top, there is a header with the European Commission logo and the text "DIGITAL SINGLE MARKET" and "DIGITAL4SCIENCE". Below the header is a navigation menu with links for "About", "Discussions", "Library", "Blogs", "Polls", and "Events". The main content area is divided into several sections:

- Excellent Science in a Digital Age:** A section inviting researchers to share their experiences and ideas on FET, FET Flagships, Open Science, and e-Infrastructures. It includes a link to "Read more about the platform".
- Take part:** A section encouraging researchers to share their experiences, present ideas, and engage with other researchers. It features a prominent "Join here to take part" button.
- What's New:** A section listing recent discussions and library items, including "Trans-national and Virtual Access", "How to set KPIs that work", "'devops' in the context of e-infrastructures", "e-Infrastructures WP2016-2017: are you ready for the TRLs?", and "Expectations for the HPC Centres of Excellence - EXDCI and HPC CoE meeting".
- Blog:** A section featuring three blog posts with author photos and names: "Welcome to the Digital4Science platform!" by Thierry Van der Pyl, "The #D4science hashtag is born!" by stephanie matt, and "Let's talk e-infrastructures!" by Augusto Burqueño Arjona.

On the right side of the interface, there is a search bar labeled "Search Digital4Science" and a "More blog posts" link at the bottom.



Digital4Science

Content:

- **Discussions:** *Share your thoughts on excellent science in the digital age. Start a discussion or participate to ongoing debates.*
- **Library:** *Upload materials or documents to endorse ongoing discussions. Post evidence to support your views, opinions or link it to an ongoing debate.*
- **Blogs:** *posts from the EC editorial team.*
- **Events:** *Consult planned events or add a relevant event. Events can be linked to ongoing discussions.*



Digital4Science

Examples of ongoing discussions:

- *e-Infrastructures WP2016-2017: are you ready for the TRLs?*
- Which International Co-operation for e-infrastructure projects?
- Overcoming the constraints of Biomedical and life sciences with e-infrastructures
- Which new skills and professions to support e-infrastructures needs?
- Which e-infrastructures for tomorrow's environmental challenges?
- How can e-Infrastructures facilitate Open Scholarship?

Some background information

HORIZON 2020



Technology Readiness Levels¹

TRL 1	Basic principles observed
TRL 2	Technology concept formulated
TRL 3	Experimental proof of concept
TRL 4	Technology validated in lab
TRL 5	Technology validated in relevant environment (industrially relevant environment in the case of key enabling technologies)
TRL 6	Technology demonstrated in relevant environment (industrially relevant environment in the case of key enabling technologies)
TRL 7	System prototype demonstration in operational environment
TRL 8	System complete and qualified
TRL 9	Actual system proven in operational environment (competitive manufacturing in the case of key enabling technologies; or in space)

¹HORIZON 2020 - Work Programme 2016–2017. General Annexes. Annex G (p.35)

PPI (Public Procurement of Innovative Solutions)¹

- PPI actions aim to enable groups of procurers to **share the risks** of acting as early adopters of innovative solutions
- Contracting authorities act as a launch customer of innovative goods or services which are not yet available on a large-scale commercial basis, and may include conformance testing
- The buyers group must contain minimum two legal independent entities which are public procurers that are established in two different Member States or associated countries.



What's
new?

¹HORIZON 2020 - Work Programme 2016–2017. General Annexes. Annex D (p.18) & Annex E (p.23-26)



Award criteria and scores

Rules regarding the evaluation and selection of proposal are described in detail in Annex H (p.36-41) of the Work Program 2016-2017

Award Criteria	Excellence	Impact	Quality and efficiency
	<ul style="list-style-type: none"> Clarity and pertinence of the objectives Soundness of the concept, and credibility of the proposed methodology 	<ul style="list-style-type: none"> The extent to which the outputs of the project would contribute to each of the expected impacts mentioned in the work programme under the relevant topic 	<ul style="list-style-type: none"> Quality and effectiveness of the work plan, including extent to which the resources assigned to work packages are in line with their objectives and deliverables; Appropriateness of the management structures and procedures, including risk and innovation management; Complementarity of the participants and extent to which the consortium as whole brings together the necessary expertise; Appropriateness of the allocation of tasks, ensuring that all participants have a valid role and adequate resources in the project to fulfil that role.
Maximum score	5	5	5
Threshold individual criterion	3	3	3
Overall threshold	10		

- Additional criteria must be considered per type of action (RIA, CSA, PPI)
- Exceptions to the general rules and criteria are clearly written in the Work Program (see "Conditions for the Call) and take precedence over the general conditions