



European
Commission



Euratom Framework Programme for Research and Training

-

Status in radioactive waste management & GD

HORIZON 2020

Christophe Davies

Project Officer

European Commission

DG Research and Innovation

Unit G4 – Fission Energy

Christophe.davies@ec.europa.eu

IGD-TP Exchange Forum #6, London, October 2015



Euratom fission (FP 2014 - 2018)

- WP2014-2015
- Joint Programming
- WP2016-2017

WP2014-2015: Results

~ €16.3M

RWM solutions, incl. GD



~ €38.3M

Reactor systems

- GEN II & III , incl. fuel cycle facilities
- GEN IV, incl. Partitioning and Transmutation
- Research infrastructures



~ €26.2M

Radiation protection & Medical applications

- Low doses
- Emergency management
- Radioecology



~ €9.4M

Competence development & socio-economic aspects

~ €15.3M

Other actions

- Jules Horowitz access rights (€15M) and GIF secretariat (€0,3M)

Grand total 2014-2015: ~ €105.5 million



Horizon 2020 EURATOM Fission - Work Programme 2014-2015 (€ million)								
Call topics and other actions	Proposals (eligible)	Total cost	Requested funding	Projects & Ratio (#selected / #proposals)	Project costs	EC funding (~ = Requested)	%	% EC topic budget
Total all areas call topics	66	300,5	234	23 = 35%	135	90,2	67%	
Nuclear Systems (1-3+15) + Infrastructures & fuel licensing (9+16)	42			10 = 24%	65,9	38,3	58%	42,5%
Radiation Protection + radioisotopes (7+8)	3			2 = 66%	35,4	26,2	74%	29,0%
Radioactive Waste Management (4-6)	9			5 = 55%	22,6	16,3	72%	18,1%
Competence dev.pment & socio-eco. aspects (10+12-14)	12			6 = 50%	11,1	9,4	85%	10,4%
Other actions	Jules Horowitz access rights					15		
	Generation IV International Forum (GIF) NEA secretariat					0,3		
Total EC funding Fission WP2014-2015						€ 105,5		

Radioactive Waste Management & Geological Disposal



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Project acronym and title	Key technical activities	Coordinator / no. partners	Start date & duration	Total cost / EU funding
JOPRAD – Towards a Joint Programming (JP) on Radioactive Waste Disposal	To study options for Joint Programming between national research programmes.	ANDRA (FR) 10 partners (5 countries)	June 2015 30 months	€1,78M / €1.1M CSA
SITEX-II – Sustainable network for Independent Technical Expertise for radioactive waste disposal – Interactions and implementation	To develop own strategic research agenda incl. civil society view, contribute to JP development , guidance & training on safety case review and prepare framework for sustainable network	IRSN (FR) 18 partners (11 countries + Canada)	June 2015 30 months	€1.48M / €1.17M CSA
CEBAMA – Cement-based materials, properties, evolution, barrier functions	To study processes at interface cement materials, bentonite and host rocks and impact on radionuclide transport and retention properties	KIT (DE) 27 partners (10 countries + Japan)	June 2015 48 months	€5,95/ €3.86M RIA (R&D)
MIND – Development of the safety case knowledge base about the influence of microbial processes on geological disposal of radioactive wastes	To study the behaviour of ILW-LL waste containing organics and the impact of microbial processes on the performance of HLW & SF in GD; Propose guidelines to communicate geomicrobiological risk	SKB (SE) 15 partners (8 countries)	June 2015 48 months	€4,71/ €4.16M RIA (R&D)
Modern2020 – Development and Demonstration of monitoring strategies & technologies for geological disposal	To develop framework, strategies, tech,gies & methods incl. civil society view for what should be monitored and how results & information can be used in decion-making and responded to	ANDRA (FR) 28 partners (12 countries + Japan)	June 2015 48 months	€8,66/ €5.99M RIA (R&D)

Competence development & Socio-economic aspects



Project acronym and title	Key technical activities	<u>Coordinator /</u> no. partners	Start date & duration	Total cost / EU funding
ANNETTE – Advanced Networking for Nuclear Education and Training and Transfer of Expertise	European Master Programme in Nuclear Science & Technology, Vocational E&T, applying ECTS, ECVET in all nuclear fields (links with SNE-TP, IGD-TP, MELODI, EHRO-N, NUGENIA, EUTERP, HERCA and IAEA)	ENEN Association (FR) 27 partners (12 countries)	In negotiation 48 months	€3.17M / €2.51M CSA
HoNEST – History of Nuclear Energy and Society	To analyse, document & improve knowledge & understanding of factors which influenced successes and failures of developments of nuclear energy & other applications including the mechanisms of societal engagement with nuclear energy	UNIV. POMPEU FABRA (ES) 24 partners (12 countries)	Sept. 2015 36 months	€3.05M / €3.05M RIA (R&D)

Joint Programming (JP):

Euratom and Member States

respective roles and research fields/tasks

Current reflections

Role and research fields by the Commission



Basis is the Euratom treaty (1957)

Aim is the peaceful development of nuclear energy

The tasks of Euratom are to:

- (Article 2(a)) develop research and ensure dissemination of technical knowledge
- (Article 4.1 and 5) Facilitate, promote co-ordination and supplement nuclear research undertaken in Member States
- (Article 6(d)) Initiate joint financing of the research programmes by the Member States

Annex I: Fields of research (*for radioactive waste*)

- IV. Processing of radioactive material
 5. Concentration and storage of useless radioactive waste
- VIII. Economic aspects of energy production
 2. Technical and economic study of fuel cycles

Role and research tasks by the Member States



Basis is the Waste Directive 2011/70/Euratom

Member States shall implement national programmes including:

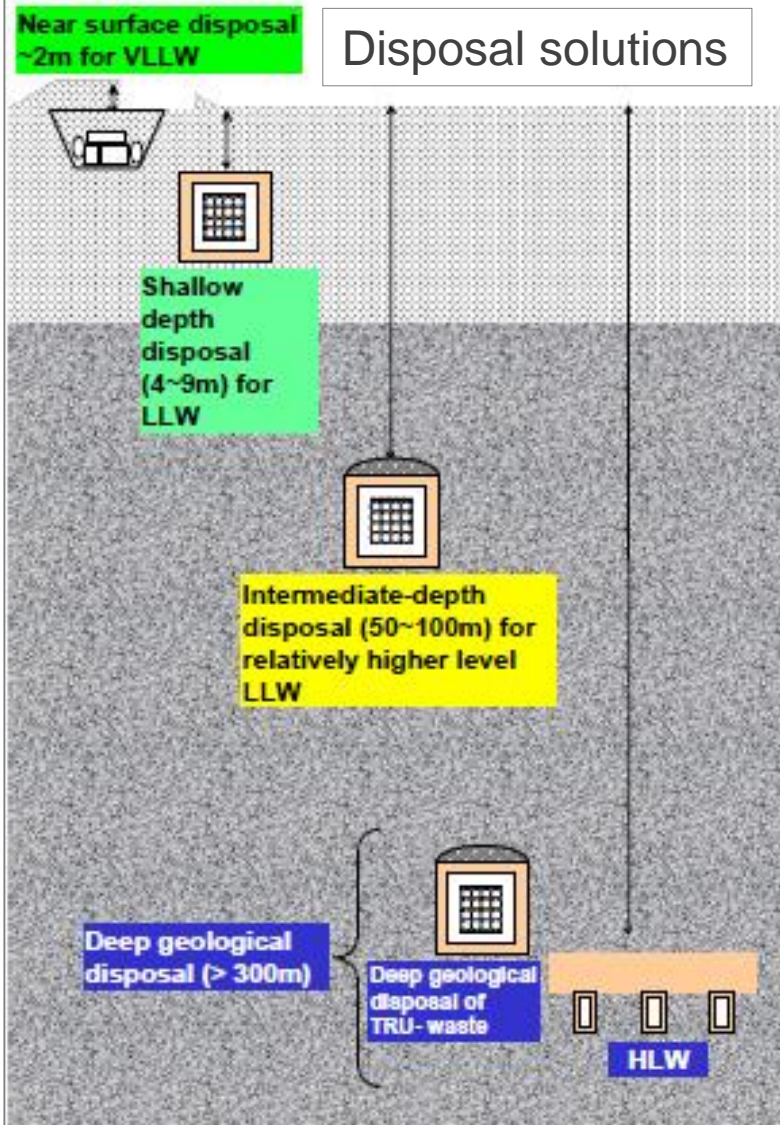
- (Article 12.1(d)) Technical solutions for spent fuel (SF) and radioactive waste management (RWM) from generation to disposal
- (Article 12.1(f)) The research, development and demonstration activities that are needed in order to implement solutions for the management of SF and RW
- (Article 8) Expertise and skills - Make arrangements for E&T for their staff, and the needed R&D activities for SF and RWM in order to obtain, maintain and to further develop necessary expertise and skills...

in recitals, IGD-TP mentioned as key source of expertise

Scope of Euratom R&D JP in RWM



Predisposal (whole spectrum of RWM activities and waste categories)



Dissemination of technical knowledge i.e.: KM & transfer between programmes, communities and generations)
Technical and economic study: Strategic and socio-economic aspects

All areas are eligible, and could be included, and deserve to be considered by MS

Reflections on Joint Programming (1)



JP is to include R&D from prioritisation within the three communities (WMO, TSO & RE) in and between MS's national programmes, as well as Horizontal and cross-cutting activities

1. Implementation of disposal solutions for the 2025 vision by WMOs: **work well advanced**
2. Safety-oriented R&D for regulatory competence and reviews by TSOs: **work is on-going**
3. Long-term science-oriented research by research entities: **No previous strategy, so expected large work to be done**

Issues to consider: inclusion of R&D on the management of other radioactive waste streams (than GD for HLW, LL & SF) for which industrially mature processes currently do not exist (all waste categories & disposal solutions as well as predisposal) and the organisations involved

Reflections on Joint Programming (2)



4. Horizontal and cross-cutting activities is an area not owned by any community but is crucial from the EU perspective

No previous strategy & no agreement on scope, so even larger work to be done

Understanding from the EC:

Knowledge Management, Dissemination and Strategic studies

Objective:

- Manage and disseminate knowledge in an integrated way at programme level for the benefit of all,
- Carry-out technical and economic studies on strategic and socio-economic aspects to give long-term credibility to JP

Reflections on Joint Programming (3)



Why KM and Dissemination

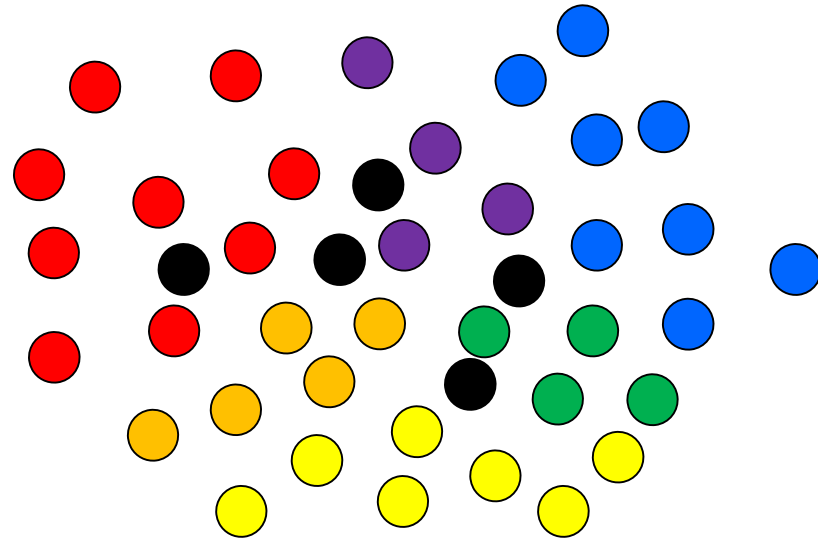
- Key staff retire and their knowledge needs to be transferred
- New staff come in and struggle to find out the status of science in various fields (bibliographic & literature surveys do not seem enough)
- Less-advanced programmes / organisations need and would greatly benefit from guidance on how to set-up and prioritise their R&D programme, including what to do, based on what is known, and when, at what stage in the programme
- Dissemination at programme level on the status of science via structured Training and of project results would be more powerful and efficient than on ad-hoc basis

Added-value: transfer of expertise (from one generation to another from country to country, between all research stakeholders: university, industry, research centres etc.) for ensuring EU qualified workforce in RWM & Disposal




Reflections on Joint Programming (4)



Why technical and economic studies on strategic and socio-economic aspects



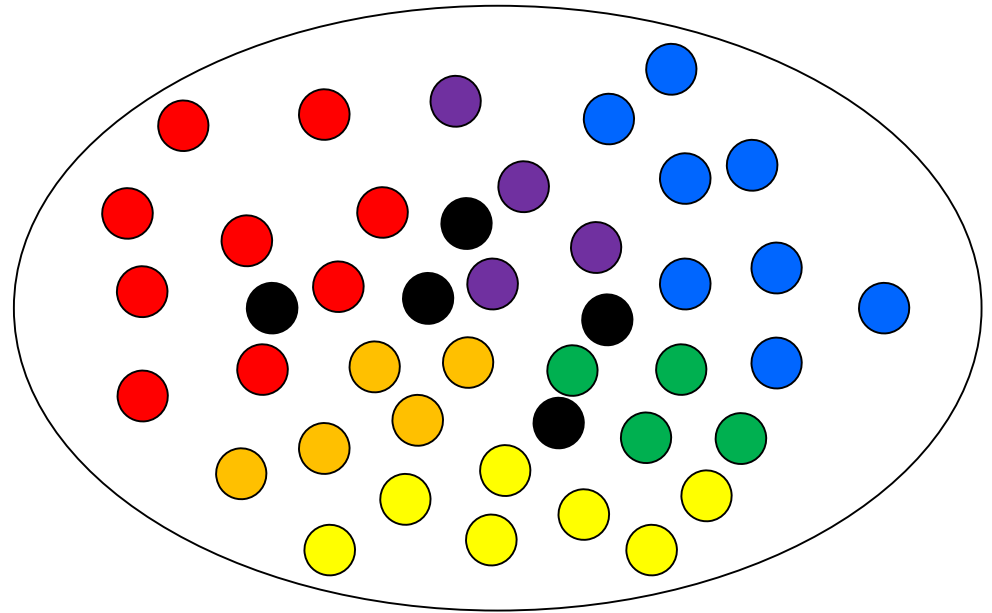
   Projects by WMO, TSO, RE

    Common projects

Reflections on Joint Programming (4)





Why technical and economic studies on strategic and socio-economic aspects

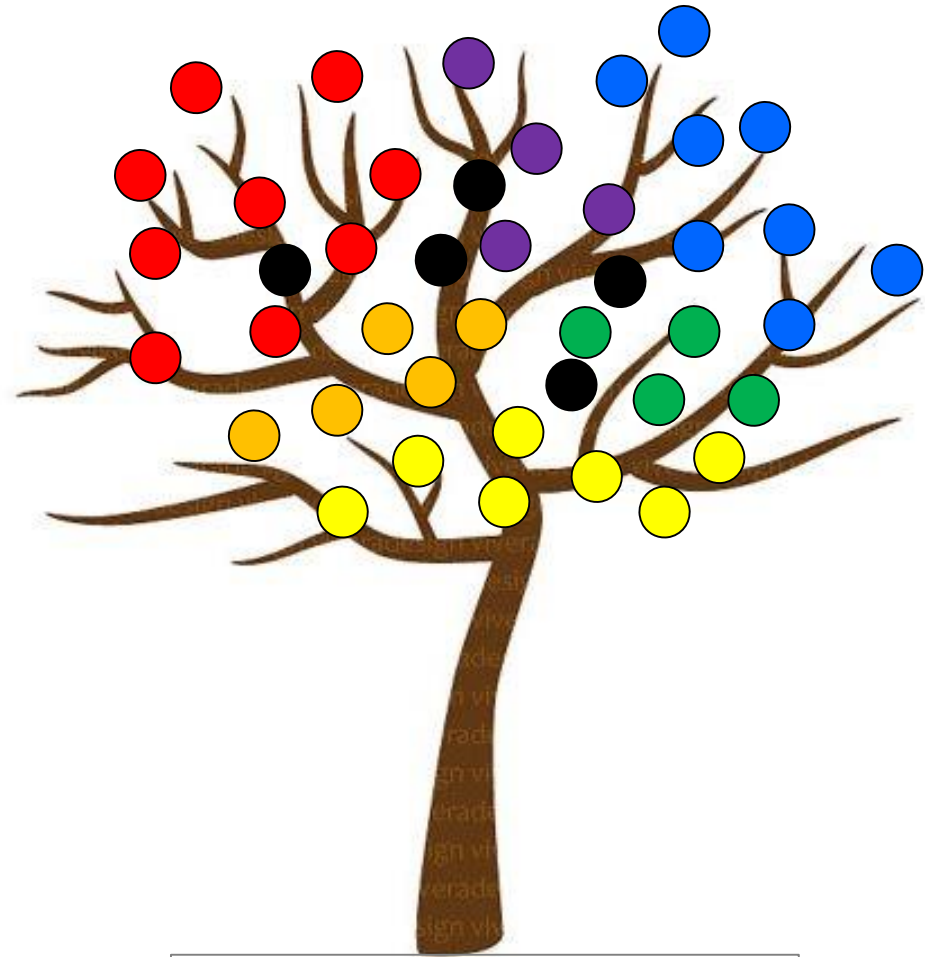


Only a collection of projects between the three communities

   Projects by WMO, TSO, RE

    Common projects

Reflections on Joint Programming (5)



● ● ● Projects by WMO, TSO, RE

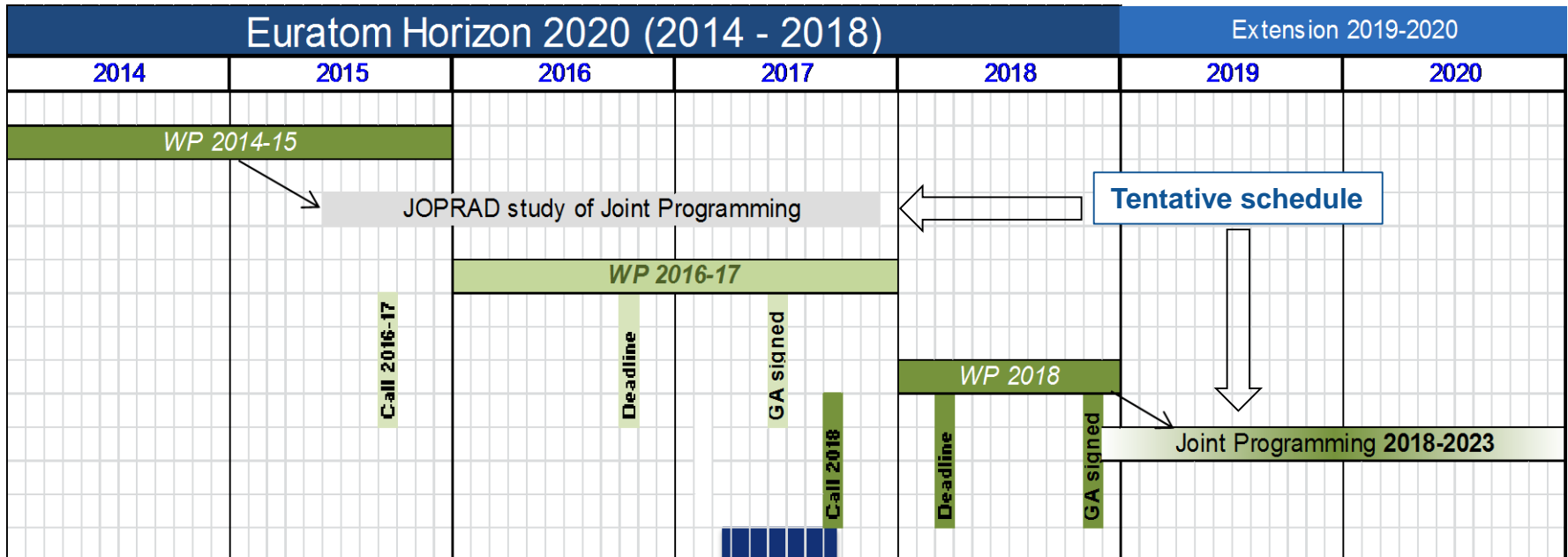
● ● ● ● Common projects

**Horizontal and cross-cutting activities
(KM, Dissemination, Strategic studies)**

JOPRAD, how to get to JP



- Duration: June 2015 – November 2017 (30 months)
- Working groups to define respective priorities for inclusion in the JP
 - WMOs : Jacques.Delay@andra.fr , JOPRAD coordinator
 - TSOs : christophe.serres@irsn.fr , SITEX coordinator
 - Research entities: bernd.grambow@subatech.in2p3.fr
 - Horizontal and strategic activities: gunnar.buckau@ec.europa.eu
- Milestone events:
 - Regional Workshop: 3-4 Feb. 2016, Bucharest (involvement of less-advanced programmes)
 - Mid-term workshop: 7-8 Sept. 2016, Prague (hold-point, draft scheme)



WP2016-2017: Call for proposals



- 1) **NFRP 6:** Key priority R&I issues for the first-of-the-kind geological repositories: IGD-TP SRA high priority topics, e.g. new and unconventional fuels, properties of engineered barrier materials and performance of engineered barrier systems. R&I actions, EUR 2 and 4 million / action
- 2) **NFRP 7:** R&I on the overall management of radioactive waste other than geological disposal: Characterisation, treatment, minimisation of volume and toxicity, quality control and checking of e.g, unconventional or legacy waste, operational wastes (incl. decommissioning/ dismantling waste); and long-term storage safety of waste and SF. R&I actions, EUR 2 and 4 million / action
- 3) **NFRP 8:** Pan-European knowledge sharing & development of competence on radioactive waste management: (transfer to countries or regions with less mature programmes) i.e. develop hands-on guidance & training material in management & economic aspects for RWM, incl. GD, S-o-A in S/T; a methodology for the transfer of knowledge, competence and technology. CS actions, EUR 1 and 2 million / action

Proposals in topics 6 to 8 ranked in one budget cluster (total indicative budget = €18,89 million)



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Community research



SecIGD2 Project

(Contract Number: 323260)

RD&D Planning Towards Geological Disposal of Radioactive Waste

DELIVERABLE (D-N°: 2.3)

Guidance for less-advanced Programmes

Author(s): T. Beattie, R. Kowe, J. Delay, G. Buckau, D. Diaconu

Reporting period: e.g. 01/07/2014 – 31/12/2015

Date of issue of this report: 30th June 2015

Start date of project: 01/01/2013

Duration: 36 Months

Project co-funded by the European Commission under the Seventh Euratom Framework Programme for Nuclear Research & Training Activities (2007-2011)

Dissemination Level

PU

Public



Event	Date
Call publication	14/10/2015
Submission tool opens	11/05/2016
Call deadline	05/10/2016
Evaluation	Oct.16 – Jan.2017
Information to applicants	01/02/2017
Grant preparations	Feb. – May 2017
Projects launch	June – July 2017

Key messages and conclusions



- ✓ Results of WP2014-15 in RWM considered to reflect well the current priorities of the stakeholders and
- ✓ EC funding €16.3 million is already > to FP7 avg. for two yrs (€13.5 million)
- ✓ There is potential to demonstrate and justify increase in JP if integrated approach is demonstrated and large scope of activities is included
- ✓ For JP, MS's programmes should flag now any interest in including activities on the broad scope of RWM (all waste categories & disposal solutions, and predisposal) and involve the organisations concerned
- ✓ JP has the potential to carry a leadership role in research on RWM and disposal at EU level
- ✓ Knowledge management, Dissemination and Strategic and socio-economic aspects will be central elements for the success, credibility and long-term sustainability of Joint Programming
- ✓ Active contribution to developing activities on KM, Diss. and Strategic and socio-economic aspects are welcome
- ✓ WP2016-2017 is a transition towards Joint Programming



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THANK YOU FOR YOUR ATTENTION