2016

Annual Activity Report

- annexes -

JOINT RESEARCH CENTRE

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ANNEX 1: Statement of the Resources Director

"I declare that in accordance with the Commission's communication on clarification of the responsibilities of the key actors in the domain of internal audit and internal control in the Commission[1], I have reported my advice and recommendations to the Director-General on the overall state of internal control in the DG.

I hereby certify that the information provided in Section 2 of the present AAR and in its annexes is, to the best of my knowledge, accurate and complete."

Brussels, Date 31 March 2017

Signed

Jean-Pierre Michel

[1] Communication to the Commission: Clarification of the responsibilities of the key actors in the domain of internal audit and internal control in the Commission; SEC(2003)59 of 21.01.2003.

ANNEX 2: Reporting – Human Resources, Better Regulation, Information Management and External Communication

This annex is the annex of section 2.2 "Other organisational management dimensions".

1. Human Resources

Objective: The DG deploys effectively its resources in support of the delivery of the Commission's priorities and core business, has a competent and engaged workforce, which is driven by an effective and gender-balanced management and which can deploy its full potential within supportive and healthy working conditions.			
Indicator 1: Percentage of female representation in middle management **Source of data: SEC(2015)336**			
Baseline (01/01/2016)	Target (31/12/2019)		Latest known results (31/12/2016)
16.4%	35% by 2019 for the JRC according to SEC(2015)336		15% *(The percentage at the end of 2016 for this indicator was lower than the baseline (16.4%) due to the middle management mobility exercise.)*
Main outputs in 2016:			
Description	Indicator	Target	Latest known results
- Tools developed to encourage women to apply for middle management positions - Full development of the pilot talent management programme for women initiated in 2015 - Translation of the Commission's Diversity Strategy 2016-2019 into a JRC Action Plan	- Number of completed phases of the talent management programme - Participants' evaluation of the talent management programme	Pilot exercise with 61 female colleagues (third phase completed by December 2016) Positive feedback from participants and recommendation of the programme to other staff	- Three workshops have been organised with the participants of the Talent Management Programme - Evaluation of programme The workshops received very positive feedback as the majority of the participants confirmed that this programme helps them to make a decision on whether or not to pursue a management position in the future. They also indicated that they would recommend this programme to other colleagues.

Indicator 2: Percentage of staff who feel that the Commission cares about their well-being **Source of data: EC Staff Satisfaction Survey**			
Baseline (31/12/2014)	Target (31/12/2020)		Latest known results (31/12/2016)
47%	50%		63%
Main outputs in 2016:			
Description	Indicator	Target	Latest known results
In the context of the JRC's implementation of the "fit@work" Commission Programme for 2016, the main outputs were: Training, awareness-raising activities and review of the social and sports infrastructure Revive the principles of the "Senior Management Charter on Equal Opportunities and working conditions"	- Number of Training and awareness-raising activities carried out to promote a fit@work culture in all JRC sites - A review of the social and sports infrastructure needs at all JRC sites - Number of nutrition awareness actions in the canteens, social and cultural activities, specific training programmes and ergonomic actions in all JRC locations	Throughout the year	At the **Ispra** site, trainings were given on wellbeing; managing conflicts; resilience; ethics and integrity; preventing harassment. JRC Volunteering Week: Healthy food campaign in JRC Ispra canteen was the only nutrition awareness campaign at the Ispra canteen. Medical Service role: Diabetes Prevention Campaign; lunchtime conference 'Burnout – comment augmenter sa résilience'; Web streaming of "How to cope after a traumatic event?" and "Diabetes prevention and management at work"; Ispra Medical Service at JRC Volunteering week 2016; Cardio-Vascular Disease Prevention Diet week"; Seasonal influenza vaccination 2016 At the **Geel** site, trainings were given on mental, emotional and physical wellbeing; ethics and integrity; resilience; become an ergonomics coach. European Week of Sports @ JRC Geel. At the **Karlsruhe** site, bi-monthly in-house wellbeing sessions; sessions with the occupational psychologist on change management, dependencies, managing conflict; lunchtime walks with stretch; office stretches sessions; participation in Commission-wide week of sports; visits of JRC confidential counsellors medical service involved in fit@work, vaccination campaigns, webstreaming of lunchtime conferences from Brussels. Survey with staff on training needs & proposals (year-long) Interviews with line managers on learning needs of their staff At the **Petten** site, trainings were given on mindfulness - learning to thrive at work; resilience; ethics and integrity; AED and RCP training:

	- Number of events promoting the role of the medical services and the social support to staff in all JRC locations - Results from surveys carried out as a means to get staff opinion on ongoing actions on the needs and suggestions for future initiatives		At the **Seville** site, trainings were given on ethics and integrity; Stress Management training; mindfulness; use of evacuation chairs and seats training; first Aid and basic life support training; ergonomics; use of defibrillators. 2 Surveys on the quality of food in our canteen. European Sport Week 1 Information session on Volunteering; Publicise at the Institute of all conferences / lunch debates organised by central HR services which were web-streamed or could be followed by videoconference.

Indicator 3: Staff engagement index **Source of data: EC Staff Satisfaction Survey**			
Baseline (31/12/2014)	Target (31/12/2020)		Latest known results (31/12/2016)
63.5%	68%		62% *(The results will be dealt with by the actions taken as a response at JRC level)*
Main outputs in 2016:			
Description	Indicator	Target	Latest known results
In order to increase staff engagement the following main outputs were planned: - Implementation of the talent management, leadership and mobility programmes covering	- Nr of events: talent management, leadership and mobility programmes covering diversity,	Throughout the year	The EULearn Learning Management System has been fully implemented and is operational. Short Term Exchange Programme: 11 staff members participated in 2016 The European School of Administration has introduced blended learning in their management training courses. Likewise the EULearn platform offers a large variety of online learning tools, such as videos and e-learning courses.

diversity, competencies and geographical dimensions - Implementation of the JRC Learning Priorities 2014-2016 - Migration to the new Learning Management System - Introduction of best practice sharing for giving feedback, both formal and informal, for providing recognition, reward and celebration of outstanding achievements - Comprehensive staff induction, recognition and exit schemes	competencies and geographical dimensions - Nr of Implementation of the JRC Learning Priorities 2014-2016 - Migration to the new Learning Management System completed - Comprehensive staff induction, recognition and exit schemes implemented - Number of reward and celebration of outstanding achievements		JRC Annual Awards: 10 awards were given in different categories during formal event with the Commissioner. Followed up by lectures by the winning teams. JRC Connected Space : JRC Recognition of Achievements At the **Ispra site**, trainings were given on Essentials of management; Lead your team; Managing your career; Selection interviewing for heads of unit; risk Assessment Application; JRC Role in EU Decision making; IPR (including e-learning course); Coaching Session on selection interviewing; Public Speaking; Chairing and Conducting Meetings; PM2; Leadership Development Workshop for Heads of Unit; Practice to give and receive constructive feedback. - Connected Training for Newcomers Final draft of Exit interview questionnaire sent to JRC sites for comments. At the **Geel** site, trainings were given on understanding EU decision making: the role of JRC; Connected@JRC; Intercultural competence building; Writing with impact; Briefings: structure and drafting techniques; Induction for Newcomers. Located close to Brussels, JRC-Geel staff attends also the courses organised centrally by DG HR in Brussels. At the **Karlsruhe** site, trainings were given on bi-monthly in-house wellbeing sessions; lunchtime walks with stretches; office stretches sessions; participation in Commission-wide week of sports On "Nr of Implementation of the JRC

			Learning Priorities 2014-2016: Excellence in science Developing people Strong Leadership Effective Communication Lean Organisation": E: 9 D: 15 L: 1 C: 9 O: 9 Furthermore, staff follow dedicated training sessions in Brussels, Luxemburg or Ispra. Award and recognition "actions de reconnaissance": 1 event Regular induction events for newcomers At the **Petten** site, trainings were given on Transitions (training for newcomers); Introduction to the Role of DG JRC in EU; Decision Making; Negotiation skills; Scientific Writing ; Clear and constructive writing; Impact Assessment in the context of better regulation: background and procedures; ARIANE II - Briefings - structure and drafting techniques; Managing your career. At the **Seville** site, trainings were given on Selection Interviewing Skills for HoU, Presentation Skills for HoU, 1 Individual coaching for HoU; 1 Deputy HoU programme; The Essential of Management; Introduction to Connected; Public Speaking; Advanced Public Speaking; PM^2 C3; PM^2 C4; Taylor made course for administrative support staff: mini sessions & mind mapping; How to understand the European Semester. Staff induction: 1) Welcome session (1&16 of each month. Basic fundamental knowledge Environment, Security, Health&Safety and IT) 2) Smooth integration of newcomers

			in their respective units through knowledge sharing and appropriate mentoring (Connected, EU LEARN, MIPS, ARES, PUBSY, JSIS, TAS, Sysper, unit programme, newcomers project). 3) Newcomers induction courses

2. Better regulation (only for DGs managing regulatory acquis)

N/A

3. Information management aspects

Objective: Information and knowledge in your DG is shared and reusable by other DGs. Important documents are registered, filed and retrievable			
Indicator 1. Degree of compliance with the Document Management e-Domec policy rules and ICS 11 requirements **Source of data: ARES/NOMCOM, SG, DIGIT, JRC DMO**			
Baseline **2016**	Target **75% to be achieved by the full implementation of the JRC's Document Management strategy and its related action plan, in response to the internal auditors' recommendations, and in accordance with e-Domec requirements.**		Latest known results **53.23%**
Main outputs in 2016:			
Description	Indicator	Target	Latest known results
Document registration, filing and preservation	Composite indicator covering all aspects of the management of lifecycle of files and documents, notably: *- unfiled documents** *- usage of e-signatory* *- files sharing within JRC*** *- files sharing with other DGs*** *- dormant files (DASU)*	100% *Less than 1%* *80%* *60%* *40%* *Less than 10%*	49.48% *4.56%* *35.22%* *19.29%* *1.69%* *39.30%*
Document management governance	Composite indicator covering all expected roles and responsibilities (DMO, CAD, DM correspondents)	100%	69.57%
Training and communication	Composite indicator covering all training and communication activities needed to comply with e-domec	100%	95%

4. External communication activities

Objective (mandatory): Citizens perceive that the EU is working to improve their lives and engage with the EU. They feel that their concerns are taken into consideration in European decision making and they know about their rights in the EU.

Indicator 1 (mandatory – provided in a ready-to-use form by DG COMM): Percentage of EU citizens having a positive image of the EU

Through its scientific research and effective management of data, information and knowledge, the JRC has grown to be an honest knowledge broker for the European Commission, a trusted peer and point of reference for policy makers, other professionals and the scientific community at large. The JRC will focus its own communication efforts on areas of strategic importance for the Commission and of high added value for EU policies.

Our communication initiatives aim to enhance the positive image of the EU by :

- ***Fostering recognition, in political, policy, scientific circles and the wider community that good EU policy decisions draw on robust scientific evidence in fields ranging, for example, from food safety to climate change.***

Ensuring that EU policies are informed by the best available scientific evidence and communicating on such evidence increasing the trust in the EU policies and leading to a positive image of the EU.

- ***Showing the relevance and added value of the science underpinning EU policies. We will do so by communicating the intelligence and the data we produce and manage in a systematic and digestible manner.***

While providing and managing knowledge, we will continue our public engagement activities by

- ***Initiating and developing a meaningful dialogue with policy-makers, the scientific community and other multipliers, for co-creation of best scientific outputs and impact.***

Definition: Eurobarometer measures the state of public opinion in the EU Member States. This global indicator is influenced by many factors, including the work of other EU institutions and national governments, as well as political and economic factors, not just the communication actions of the Commission. It is relevant as a proxy for the overall perception of the EU citizens. Positive visibility for the EU is the desirable corporate outcome of Commission communication, even if individual DGs' actions may only make a small contribution.

Source of data: Standard Eurobarometer (DG COMM budget)

Baseline: November 2014	**Target**: 2020	Latest known results 2016
Total "Positive": 39% Neutral: 37 % Total "Negative": 22%	Positive image of the EU ≥ 50%	Positive: 35% Neutral: 38% Negative: 25%

Indicator 2: Articles in the media - Total number of articles in the media

Source of data: JRC internal indicator

Baseline	**Target**	Latest known results

2015	2016	2016
2770	2016: >2700 2020: to be defined on the basis of time series to be established, as this is a new indicator	1702, down by about 1000 from 2015 due to different monitoring after 01/07/2016
Indicator 3a: Access to JRC websites - Number of page views on the JRC website **Indicator 3b. Access to JRC websites - Number of visits to the JRC website** **Source of data:** JRC internal indicator		
Baseline 2015	**Target** 2016	Latest known results 2016
3a. 7.7 million 3b. 2.8 million	3a. 2016 > 7.7 million 2020: to be defined on the basis of time series to be established, as this is an indicator calculated with new parameters 3b. 2016: > 2.8 million 2020: to be defined on the basis of time series to be established, as this is an indicator calculated with new parameters	3a. 6.7 million 3b. 2.7 million

Significant communication actions for 2016

No.	Communication action	Target date	EC political priority addressed	• DG JRC Strategic plan / JRC thematic focus areas	Output /outcome Indicators	Latest known results
1.	JRC Annual Conference (In June 2016) focused on Human Capital and Territorial Development – organisation, publication(s) and all communication tools related to such highlight event	Third quarter (11 October 2016)	Towards a New Policy on Migration	Migration and Territorial Development	Number of participants (Target 300) and indirect audience reach; Satisfaction rate of participants	Number of participants: 338. No satisfaction survey launched. Results of social media presence: Average nr of people reached via each: - Facebook live videos, 2221 (a total of 17768 people for 8 videos)

						- hashtag of the event #EUSciPol16 was mentioned 640 times on Twitter and 81 on Facebook. We don't have exact reach figures for Twitter.
2.	Official launch events of several knowledge and competence centres run by the JRC to support EC political priorities such as: the Competence Centre on Composite Indicators and Scoreboards (COIN), Micro-economic evaluation, Text Mining as well as Knowledge Centre for Territorial Policies, Migration and Demography and more.	First, second and third Quarter	A Resilient Energy Union with a Forward-Looking Climate Change Policy A deeper and fairer Internal Market with a Strengthened Industrial Base A New Boost For Jobs, Growth and Investment A Deeper and Fairer Economic and Monetary Union	Economy, Finance and Markets Energy and Transport Data and Digital Transformation Migration and Territorial Development	5 centres launched; Number of participants (100 stakeholders per launch) Indirect audience reach; Number of people who engage in follow-up activities;	Number of participants for each launch was above 100 (average 120)
3.	Open Day in Ispra, Italy, on the theme "Making Sense of Science" (provisional), with strong outreach and public engagement and online coverage; other Open Days initiatives on other JRC sites (Geel	Second quarter	A Union of Democratic Change	Education, Skills and Employment Data and Digital Transformation	Number of participants (Target 10 000 visitors); Number of participants stating their likelihood to share the information learnt;	At the Open Day 7623 registered visitors attended, this means a 70% turn-out from the 10678 registrations. Over 500 volunteers helped out during (part of) the day

	Karlsruhe, Petten, Sevilla)				Number of people reached on social media (views, shares, discussions); Satisfaction rate of visitors	The dedicated Facebook event reached around 10.000 people while the hashtag #EUopenscience was mentioned 602 times in total (473 on Twitter + 129 on Facebook public interactions).
4.	Organisation of stakeholder events eg 'Science meets Parliaments', launch of the 'Energy Efficiency Platform' (05/04/16), JRC Policy Research Forum 'The Social Dimension of the Economic and Monetary Union' (24-26/05/16).	All year	At least four EC political priorities addressed	At least four JRC thematic focus areas addressed	10 events organised with at least 100 participants per event in given policy area	7 events; thematic focus areas addressed Brussels based Science meets Regions and Science meets Parliaments took place on 7-8 November 2016 with more than 250 participants. Each of the regional events attracted roughly 100 participants.
5.	4 Euronews Science Reports, e.g. on 'Portable Emissions Monitoring Systems (PEMS)', VELA 8 & 9 (further topics to be defined)	Third and fourth quarter	At least four EC political priorities addressed	At least four JRC thematic focus areas addressed	People reached Number of views online	Euronews reports are shared on our social media and record positive performance especially on Facebook reaching an average of 3000 per post.
6.	Production of	First	All EC	ALL JRC	Number	Annual

	key publications such as: JRC Annual Report 2015, Environmental Sustainability report (thematic report), JRC Annual Conference Report	and second quarter	political priorities addressed	thematic focus areas addressed	of materials distributed;	report: 15.500 (+/-)
7.	Further development of the JRC Science Hub – continue the web rationalisation, more focused on political priorities, further develop collaborative communities of practice enabling more dialogue with stakeholders	All year	Most EC political priorities addressed	Most thematic focus areas	Number of visits (3 million in 2016), page views (8 million 2016), most used devices; Engagement rate on communities of practice.	Science Hub website page views for 2016: 6.654.564 Science Hub website unique visits: 2.692 989 Web rationalisation continued, in 2016. The Web Registry to day counts 415 entries (including new requests). In 2016 we developed eight collaborative communities of practice for engagement with external stakeholders. Most active (in terms of engagement) community is the TTO Circle with 85 published content items. The highest membership number is with the Alumni

						Community – 271 members
8.	Continuation of the JRC Visits' Programme in Ispra, Italy and on other JRC sites, including the development of a web driven JRC visitors' centre experience for wider outreach and public engagement	All year	Most EC political priorities addressed	Most JRC thematic focus areas addressed	Number of visits on all JRC sites; Number of views on the internet and downloads	Final figures not yet available
9.	Initiate and develop science communication actions such as: the JRC science blog, policy lab blog, interactive tools explaining complex scientific work and other data visualisation online products (such as infographics and animation videos) to explain the science underpinning the 2016 key initiatives implementing EC political priorities	All year	Most EC political priorities addressed	Most EC political priorities addressed	Number of mentioned products; number of views; number of blog posts; number of comments; engagement rate: shares, likes, discussions;	All best performing JRC social media posts crossplatform in 2016 (especially on Twitter) present a an element of data visualization, highlighting the importance of such material for our digital communication output.
10.	European Commission's contribution to and participation in	Second and third quarters	Most EC political priorities addressed	Most EC political priorities addressed	Number of participants who noticed	At ESOF 2016 the JRC has been the best performing

	the scientific programmes of European and International science events and fora such as: EuroScience Open Forum (ESOF), AAAS, Dutch Presidency Open Science Conference etc.				EC participation; Indirect audience reach through traditional and social media	account in terms of engagement (the sum of posts, likes, retweets) which basically measures the "effort" an account has put into tweeting about the event, and influence (the ranking of accounts whose posts are liked, retweeted, commented, replied the most). For the first time we used Facebook live a product that allows you to launch a live broadcast directly from your Facebook page. Once the broadcast is done, the video remains on your page. We noticed that the reach of posts including Facebook live was up to 30 times higher than our average posts, reaching up to 50.000 people.

Annual communication spending (based on estimated commitments):			
Baseline (Year n-1):	Target (Year n):	Total amount spent	Total of FTEs working on external communication
No baseline in the MP 2016	1.47 mill. €	1.489 mill. €	N/A

5. Infrastructure

a. Infrastructure Development

Objective: Infrastructure development: Harmonise the approach to infrastructure development across the JRC. Energy conservation: Drive energy efficiency gains. Operational efficiency: Increase efficiency of site-related facilities and services.		
Indicator 1a: Surface area calculations Definition: Surface area of new buildings delivered and buildings demolished and refurbished in line with Directive 2012/27/EU **Source of data: JRC internal indicator and Directive 2012/27/EU**		
Baseline	Interim Milestone	Target
2016 data: On JRC sites (Brussels excluded), there are 228 423 sqm of buildings not compliant to the energy standards. New buildings delivered: 1 829 sqm Buildings demolished: 2 079 sqm Buildings refurbished: 8 804 sqm (3.7 % of total surface as defined in Directive 2012/27/EU article 5)[2]	Annual assessment of the total surface not meeting the national minimal standards in terms of energy efficiency on the basis of article 5 of the Directive 2012/27/EU.	In order to fulfil the "exemplary role of public bodies' buildings" as described in the Energy Efficiency Directive 2012/27/EU, the minimum of 3% for refurbishment should be reached annually.

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JRC site	Surface not compliant with energy standards	New buildings	Demolitions	Refurbishments with % according to 2012/27/EU	
Geel	29 423	0	0	3889	11.7%
Ispra	139 257	529	1 189	4 915	3.4%
Karlsruhe	31 637	0	0	0	0.0%
Petten	20 971	1 300	890	0	0.0%
Seville	7 165	0	0	0	0.0%
Total	**228 453**	**1 829**	**2 079**	**8 804**	3.7%

Main outputs in 2016			
Description	Indicator	Target	Latest known results
At global level, JRC refurbished 8,804 sqm to current standards in energy efficiency.	8 804 sqm	3%	3.7%
In **Ispra**, the delivery of building 27b, fully refurbished in energy-class A, with "very good" level according to BREEAM certification is the most prominent output of the year. Together with the final phase of refurbishment of building 18p, it contributes to reach and slightly surpass the set annual target for Ispra site.	2 699 sqm	3%	3.4%
	3 889 sqm	3%	11,7%
In **Geel**, the Linac accelerator flight path cabins were refurbished as well as building 60. Both areas do fulfil the Belgian energy performance standards.	0 sqm	3%	0%
In **Karlsruhe,** 31,657 sqm of older existing buildings are out of the range of the national minimal standards in terms of energy efficiency on the basis of article 5 of the Directive 2012/27/EU: Wing A-B-D-E-F-G-H. 9498 sqm of more recent buildings are compliant (Wing NCO in 2013: 7927 m2, Wing R+S in 2015: 1571 m2).	1 300 sqm	3%	0%
In **Petten**, 2016 saw the completion of an energy efficient A+ (NL Energy Performance Rating minimum required under 2015 Building Regulations) new Smart Grid Showcase Laboratory building 311.			
Indicator 1b: Nearly zero-energy buildings Definition: Implementation of Energy Performance of buildings Directive 2010/31/EU **Source of data: JRC internal indicator and Directive 2010/31/EU**			

Baseline	Interim Milestone	Target
2016 data: In **Ispra**, there are not yet any "Nearly zero-energy building" already built. However the project for the construction of building 102 is compliant with this classification. In **Geel**, two new buildings are in compliance with the latest Belgian regulations. In 2016, 3889 m^2 have been refurbished and were made energy efficient. In **Karlsruhe** there is no "Nearly zero-energy building" In **Petten**, there is no "Nearly zero-energy building" already built, however the project for the construction of building 315 (New Reception Building) is compliant with this classification. In **Seville**, there are not yet any "Nearly zero-energy building" already built; a preliminary study on the JRC Seville site constraints and alternatives, submitted to the JRC Management, describes an option compliant with this classification.	Given the usual duration for construction works for significantly big buildings, all projects related to the construction of new buildings on JRC sites should already foresee only zero-energy characteristics.	After 2018, all new buildings constructed on JRC sites should be "nearly zero-energy buildings" in line with Directive 2010/31/EU article 9 paragraph 1 (b).

Main outputs in 2016

Description	Indicator	Target	Latest known results
In **Ispra**, the project for the construction of building 102 has been re-launched after a suspension of nearly one year, and was finally approved by the Budget Authority (in February 2017).	10 500 sqm	Nearly-zero Energy building	Construction will start in April 2017 for final delivery in 2020. When in use, this building will contribute to a reduction of roughly 4.5% of the total energy consumption of

In **Petten**, the project for the construction of building 315 has been re-launched as an open call end 2016 and the tender procedure is expected to close September 2017.	1 200 sqm		Ispra site, after demolition or shutdown of 10 smaller obsolete buildings. Construction will start in October 2017 for final delivery in 2019.
Indicator 1c: JRC Infrastructure Development governance structure **Source of data: JRC internal indicator**			
Description	Indicator	Target	Latest known results
Implementation of JRC Infrastructure Development governance structure	Implementation of the governance structure	100% implementation of the governance structure	The governance structure has been put in place fully with the new organisational structure of JRC on 01/07/2016. In line with the JRC Strategy 2030, more specifically its chapter 11, infrastructure development is now centralised in the Resources Directorate under the supervision of a single Senior Manager.

b. Decommissioning

Objective:
Implement the Decommissioning & Waste Management Programme (see progress indicators)

Main outputs in 2016 (Main outputs for 2016 broken down according to the four relevant JRC sites can be found in Annex 6)

Description	Indicators	Target (2016)	Latest known results 2016
Review of JRC Decommissioning budget: finalisation of the review for the sites Ispra, Geel and Karlsruhe	No indicator in the MP 2016	Q3	The Geel budget was finalised. For Karlsruhe the review is ongoing and will be finalised in February 2017. For the Ispra site, the draft budget report has been finalised. Budget review was done involving JRC's Expert Group members on ND&WMP. Finalisation of budget estimation is expected by February 2017. For Petten a contract was signed with an external company in June in order to carry out the budget review. Results are expected for Q4 (2017)

c. Supplementary research programme for the High Flux Reactor in Petten

Objective: **Operation of the high-flux reactor** **Main outputs in 2016**			
Description	**Indicators**	**Target (2016)**	**Latest known results 2016**
Finalisation of the HFR Supplementary program 2016-2019 Report on the operation of the HFR in the period 2014-2015	- 1 Council Decision of the New Supplementary programme - 1 Report on the operation of the HFR in the period 2014-2015	- 1 Council Decision of the New Supplementary programme - 1 report on the operation of the HFR in the period 2014-2015	- The new HFR Supplementary Research Programme (2016-2019)was prepared for discussion and adoption in the Council. The process was delayed due the late financial data input from the Member States that are to finance it (NL and FR). It is now expected to be adopted early 2017. - The bi-annual Report from the Commission to the Council and the European Parliament on the operation and research activities of the High Flux Reactor for the period 2014-2015 was prepared. Due to the lack of financial data for the year 2014-2015, that was not provided by NRG (NL) operator of the reactor, this report is still not released. All the technical and scientific content is ready. It is expected to be adopted once we receive the financial data (estimated for the first half of 2017).

ANNEX 3: Draft annual accounts and financial reports

Annex 3 Financial Reports - DG JRC - Financial Year 2016

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TABLE 1: OUTTURN ON COMMITMENT APPROPRIATIONS IN 2016 (in Mio €)					
			Commitment appropriations authorised	Commitments made	%
			1	2	3=2/1
Title 05 Agriculture and rural development					
05	05 07	Audit of agricultural expenditure financed by the European Agricultural Guarantee Fund (EAGF)	9.13	9.12877796	99.99 %
	05 08	Policy strategy and coordination of the 'Agriculture and rural development' policy area	2.421842	2.27375206	93.89 %
Total Title 05			11.551842	11.40253002	98.71%
Title 10 Direct research					
10	10 01	Administrative expenditure of the 'Direct research' policy area	459.877089	410.658021	89.30 %
	10 02	Horizon 2020 - Direct actions of the Joint Research Centre (JRC) in support of Union policies	96.94699397	31.95581577	32.96 %
	10 03	Euratom Programme - Direct actions	20.31752461	11.58576771	57.02 %
	10 04	Other activities of the Joint Research Centre	321.5474322	22.13944542	6.89 %
	10 05	Historical liabilities resulting from nuclear activities carried out by the Joint Research Centre pursuant to the Euratom Treaty	28.60004242	28.58494544	99.95 %
Total Title 10			927.2890822	504.9239953	54.45%
Total DG JRC			938.8409242	516.3265253	55.00 %

** Commitment appropriations authorised include, in addition to the budget voted by the legislative authority, appropriations carried over from the previous exercise, budget amendments as well as miscellaneous commitment appropriations for the period (e.g. internal and external assigned revenue).*

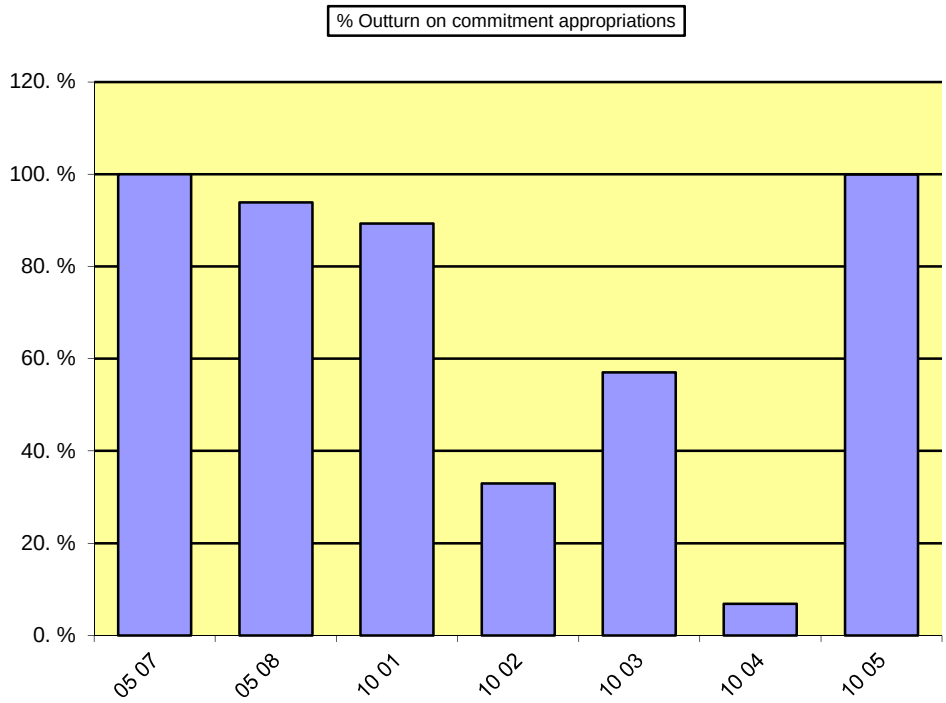


TABLE 2: OUTTURN ON PAYMENT APPROPRIATIONS IN 2016 (in Mio €)					
Chapter			Payment appropriations authorised *	Payments made	%
			1	2	3=2/1
Title 05 Agriculture and rural development					
05	05 07	Audit of agricultural expenditure financed by the European Agricultural Guarantee Fund (EAGF)	9.91877026	8.79616418	88.68 %
	05 08	Policy strategy and coordination of the 'Agriculture and rural development' policy area	1.840367	1.64764964	89.53 %
Total Title 05			11.75913726	10.44381382	88.81%
Title 10 Direct research					
10	10 01	Administrative expenditure of the 'Direct research' policy area	513.1397224	379.1922398	73.90 %
	10 02	Horizon 2020 - Direct actions of the Joint Research Centre (JRC) in support of Union policies	94.03432009	32.27717862	34.32 %
	10 03	Euratom Programme - Direct actions	17.38828452	9.76245046	56.14 %
	10 04	Other activities of the Joint Research Centre	249.124179	21.19299428	8.51 %
	10 05	Historical liabilities resulting from nuclear activities carried out by the Joint Research Centre pursuant to the Euratom Treaty	22.79410688	22.78809361	99.97 %
Total Title 10			896.4806129	465.2129567	51.89%
	Total DG JRC		908.2397501	475.6567706	52.37 %

** Payment appropriations authorised include, in addition to the budget voted by the legislative authority, appropriations carried over from the previous exercise, budget amendments as well as miscellaneous payment appropriations for the period (e.g. internal and external assigned revenue).*

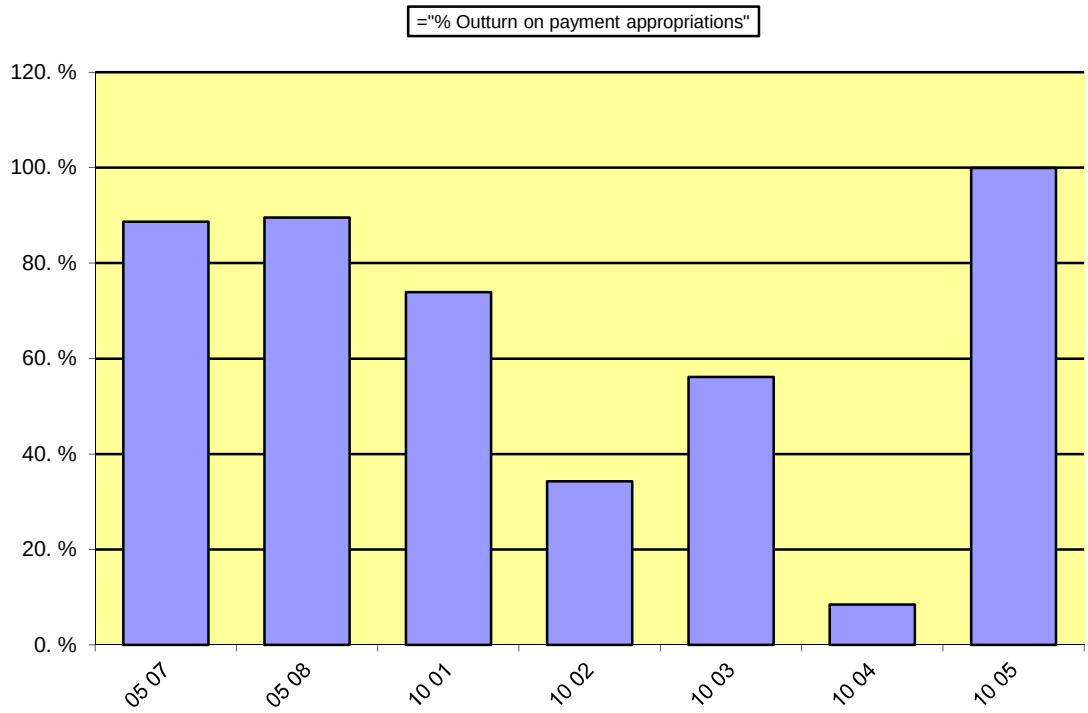


TABLE 3 : BREAKDOWN OF COMMITMENTS TO BE SETTLED AT 31/12/2016 (in Mio €)									
Chapter			2016 Commitments to be settled				Commitments to be settled from financial years previous to 2016	Total of commitments to be settled at end of financial year 2016(incl corrections)	Total of commitments to be settled at end of financial year 2015 (incl. corrections)
			Commitments 2016	Payments 2016	RAL 2016	% to be settled			
			1	2	3=1-2	4=1-2/1	5	6=3+5	7
Title 05 : Agriculture and rural development									
05	05 07	Audit of agricultural expenditure financed by the European Agricultural Guarantee Fund (EAGF)	9.12877796	8.06	1.0732548	11.76 %	0.00	1.07	0.79
	05 08	Policy strategy and coordination of the 'Agriculture and rural development' policy area	2.27375206	0.03	2.2485185	98.89 %	0.09	2.33	1.74
Total Title 05			11.4025300	8.08	3.3217733	29.13%	0.085393	3.4071663	2.533259
Title 10 : Direct research									
10	10 01	Administrative expenditure of the 'Direct research' policy area	410.504834	336.63	73.879080	18.00 %	6.27	80.15	57.09
	10 02	Horizon 2020 - Direct actions of the Joint Research Centre (JRC) in support of Union policies	31.9558158	10.87	21.090633	66.00 %	9.28	30.37	33.61
	10 03	Euratom Programme - Direct actions	11.5857677	4.28	7.3048255	63.05 %	3.43	10.73	9.65
	10 04	Other activities of the Joint Research Centre	22.1394454	7.84	14.302275	64.60 %	5.58	19.89	22.77
	10 05	Historical liabilities resulting from nuclear activities carried out by the Joint Research Centre pursuant to the Euratom Treaty	28.5849454	6.18	22.407865	78.39 %	30.44	52.85	49.80
Total Title 10			504.770809	365.79	138.98468	27.53%	54.99632	193.98100	172.9168
	Total DG JRC		516.173339	373.87	142.30645	27.57 %	55.08172	197.38817	175.4500

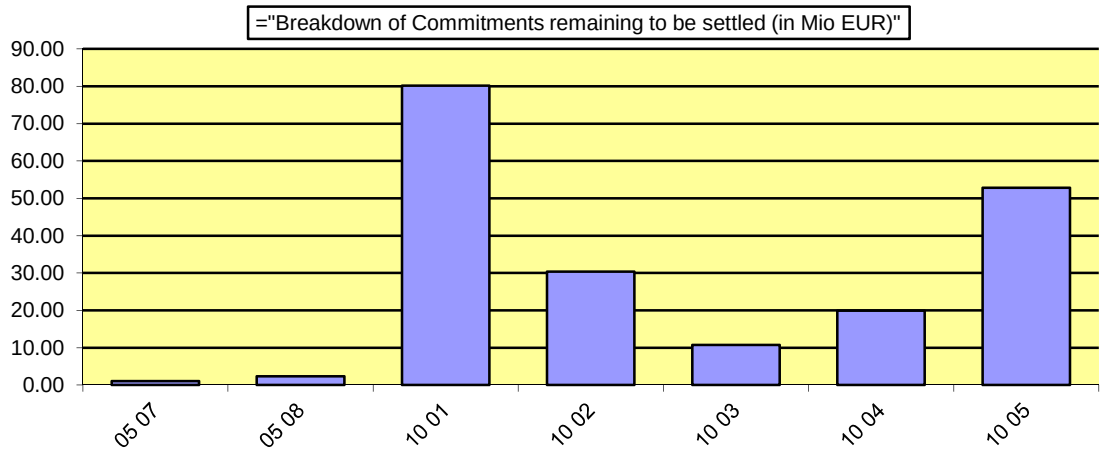


TABLE 4 : BALANCE SHEET JRC

BALANCE SHEET	2016	2015
A.I. NON CURRENT ASSETS	213,861,206	225,576,464
A.I.1. Intangible Assets	1,947,950	2,308,797
A.I.2. Property, Plant and Equipment	211,895,383	220,975,614
A.I.5. Non-Current Pre-Financing	0	2,274,180
A.I.6. Non-Cur Exch Receiv & Non-Ex Recoverab	17,873	17,873
A.II. CURRENT ASSETS	-729,100,120	-606,080,106
A.II.2. Current Pre-Financing	3,473,659	1,609,964
A.II.3. Curr Exch Receiv &Non-Ex Recoverables	-786,813,079	-663,038,266
A.II.4. Inventories	54,120,231	55,236,780
A.II.6. Cash and Cash Equivalents	119,070	111,416
ASSETS	**-515,238,913**	**-380,503,642**
P.I. NON CURRENT LIABILITIES	-1,086,664,832	-1,052,760,534
P.I.2. Non-Current Provisions	-1,086,660,989	-1,052,756,691
P.I.3. Non-Current Financial Liabilities	-3,843	-3,843
P.II. CURRENT LIABILITIES	-28,094,860	-55,324,531
P.II.2. Current Provisions	-27,240,857	-28,137,599
P.II.4. Current Payables	-845,158	-6,252,945
P.II.5. Current Accrued Charges &Defrd Income	-8,845	-20,933,987
LIABILITIES	**-1,114,759,692**	**-1,108,085,065**
NET ASSETS (ASSETS less LIABILITIES)	**-1,629,998,606**	**-1,488,588,707**

P.III.2. Accumulated Surplus / Deficit	4,009,747,651	3,811,286,573

Non-allocated central (surplus)/deficit*	-2,379,749,045	-2,322,697,866

TOTAL	**0**	**0**

It should be noted that the balance sheet and statement of financial performance presented in Annex 3 to this Annual Activity Report, represent only the assets, liabilities, expenses and revenues that are under the control of this Directorate General. Significant amounts such as own resource revenues and cash held in Commission bank accounts are not included in this Directorate General's accounts since they are managed centrally by DG Budget, on whose balance sheet and statement of financial performance they appear. Furthermore, since the accumulated result of the Commission is not split amongst the various Directorates General, it can be seen that the balance sheet presented here is not in equilibrium.

Additionally, the figures included in tables 4 and 5 are provisional since they are, at this date, still subject to audit by the Court of Auditors. It is thus possible that amounts included in these tables may have to be adjusted following this audit.

TABLE 5 : STATEMENT OF FINANCIAL PERFORMANCE JRC		
STATEMENT OF FINANCIAL PERFORMANCE	**2016**	**2015**
II.1 REVENUES	-93,844,718	-84,121,735
II.1.1. NON-EXCHANGE REVENUES	-176,742	-271,183
II.1.1.5. RECOVERY OF EXPENSES	-176,742	-258,544
II.1.1.6. OTHER NON-EXCHANGE REVENUES	0	-12,639
II.1.2. EXCHANGE REVENUES	-93,667,976	-83,850,552
II.1.2.1. FINANCIAL INCOME	-12,583	-475
II.1.2.2. OTHER EXCHANGE REVENUE	-93,655,392	-83,850,076
II.2. EXPENSES	259,307,844	282,582,812
II.2. EXPENSES	259,307,844	282,582,812
II.2.10.OTHER EXPENSES	169,025,221	129,185,559
II.2.2. EXP IMPLEM BY COMMISS&EX.AGENC. (DM)	73,419,522	118,080,642
II.2.6. STAFF AND PENSION COSTS	16,847,774	35,285,965
II.2.8. FINANCE COSTS	15,326	30,646
STATEMENT OF FINANCIAL PERFORMANCE	**165,463,126**	**198,461,078**

It should be noted that the balance sheet and statement of financial performance presented in Annex 3 to this Annual Activity Report, represent only the assets, liabilities, expenses and revenues that are under the control of this Directorate General. Significant amounts such as own resource revenues and cash held in Commission bank accounts are not included in this Directorate General's accounts since they are managed centrally by DG Budget, on whose balance sheet and statement of financial performance they appear. Furthermore, since the accumulated result of the Commission is not split amongst the various Directorates General, it can be seen that the balance sheet presented here is not in equilibrium.

Additionally, the figures included in tables 4 and 5 are provisional since they are, at this date, still subject to audit by the Court of Auditors. It is thus possible that amounts included in these tables may have to be adjusted following this audit.

TABLE 5bis : OFF BALANCE SHEET JRC

OFF BALANCE	2016	2015
OB.1. Contingent Assets	16,296,190	22,482,554
GR for other		0.00
GR for performance	15,008,970.44	19,553,174.14
GR for pre-financing	1,287,219.20	2,929,379.63
OB.2. Contingent Liabilities	-2,800,000	-2,800,000
OB.2.7. CL Amounts relating to legal cases	-2,800,000.00	-2,800,000.00
OB.3. Other Significant Disclosures	-3,345,677	-174,789,368
OB.3.2. Comm against app. not yet consumed	0.00	-168,197,686.00
OB.3.3.7.Other contractual commitments	-2,924,721.37	-5,654,062.09
OB.3.5. Operating lease commitments	-420,955.68	-937,620.25
OB.4. Balancing Accounts	-10,150,513	155,106,815
OB.4. Balancing Accounts	-10,150,512.59	155,106,814.57
OFF BALANCE	**0.00**	**0.00**

It should be noted that the balance sheet and statement of financial performance presented in Annex 3 to this Annual Activity Report, represent only the assets, liabilities, expenses and revenues that are under the control of this Directorate General. Significant amounts such as own resource revenues and cash held in Commission bank accounts are not included in this Directorate General's accounts since they are managed centrally by DG Budget, on whose balance sheet and statement of financial performance they appear. Furthermore, since the accumulated result of the Commission is not split amongst the various Directorates General, it can be seen that the balance sheet presented here is not in equilibrium.

Additionally, the figures included in tables 4 and 5 are provisional since they are, at this date, still subject to audit by the Court of Auditors. It is thus possible that amounts included in these tables may have to be adjusted following this audit.

TABLE 6: AVERAGE PAYMENT TIMES FOR 2016 - DG JRC

Legal Times							
Maximum Payment Time (Days)	**Total Number of Payments**	**Nbr of Payments within Time Limit**	**Percentage**	**Average Payment Times (Days)**	**Nbr of Late Payments**	**Percentage**	**Average Payment Times (Days)**
30	23254	21664	93.16 %	15.712334	1590	6.84 %	45.142767
45	227	223	98.24 %	13.941704	4	1.76 %	362
50	1	1	100.00 %	40			
60	357	352	98.60 %	23.161932	5	1.40 %	76.2
90	33	33	100.00 %	37.030303			

Total Number of Payments	**23872**	**22273**	**93.30 %**		**1599**	**6.70 %**	
Average Net Payment Time	**17.8670409**			**15.8450141**			**46.0325203**
Average Gross Payment Time	**20.5477547**			**18.3596282**			**51.0268918**

Target Times							
Target Payment Time (Days)	**Total Number of Payments**	**Nbr of Payments within Target Time**	**Percentage**	**Average Payment Times (Days)**	**Nbr of Late Payments**	**Percentage**	**Average Payment Times (Days)**
30	2332	2226	95.45 %	15.0350404	106	4.55 %	54.509434

Total Number of Payments	**2332**	**2226**	**95.45 %**		**106**	**4.55 %**	
Average Net Payment Time	**16.829331**			**15.0350404**			**54.509434**
Average Gross Payment Time	**21.5883362**			**19.2920036**			**69.8113208**

Suspensions							
Average Report Approval Suspension Days	**Average Payment Suspension Days**	**Number of Suspended Payments**	**% of Total Number**	**Total Number of Payments**	**Amount of Suspended Payments**	**% of Total Amount**	**Total Paid Amount**
0	44	1465	6.14 %	23872	18,602,055	8.74 %	212,834,869

Late Interest paid in 2016			
DG	**GL Account**	**Description**	**Amount (Eur)**
JRC	65010000	Interest expense on late payment of charges	512.77
JRC	65010100	Interest on late payment of charges New FR	14 518.71
			15 031.48

TABLE 7 : SITUATION ON REVENUE AND INCOME IN 2016								
Chapter		Revenue and income recognised			Revenue and income cashed from			Outstanding balance
		Current year RO	Carried over RO	Total	Current Year RO	Carried over RO	Total	
		1	2	3=1+2	4	5	6=4+5	7=3-6
40	MISCELLANEOUS TAXES AND DEDUCTIONS	23,164,027	0	23,164,027	23,164,027	0	23,164,027	0
41	CONTRIBUTIONS TO THE PENSION SCHEME	20,590,988	0	20,590,988	20,590,988	0	20,590,988	0
62	REVENUE FROM SERVICES RENDERED AGAINST PAYMENT	81,612,044	11,545,822	93,157,867	76,509,107	11,447,740	87,956,847	5,201,020
66	OTHER CONTRIBUTIONS AND REFUNDS	2,573,644	94,216	2,667,859	2,439,087	23,532	2,462,619	205,240
Total DG JRC		**127,940,703**	**11,640,038**	**139,580,741**	**122,703,208**	**11,471,272**	**134,174,481**	**5,406,260**

TABLE 8 : RECOVERY OF PAYMENTS
(Number of Recovery Contexts and corresponding Transaction Amount)

INCOME BUDGET RECOVERY ORDERS ISSUED IN 2016	Error		Irregularity		Total undue payments recovered		Total transactions in recovery context (incl. non-qualified)		% Qualified/Total RC	
Year of Origin (commitment)	Nbr	RO Amount	Nbr	RO Amount	Nbr	RO Amount	Nbr	RO Amount	Nbr	RO Amount
2014							3	1,578.90		
2015	2	540.98			**2**	**540.98**	3	836.98	66.67%	64.63%
2016			1	40,387.39	**1**	**40,387.39**	13	53,290.36	7.69%	75.79%
No Link	3	21,014.92	3	81,689.02	**6**	**102,703.94**	37	479,480.48	16.22%	21.42%
Sub-Total	**5**	**21,555.90**	**4**	**122,076.41**	**9**	**143,632.31**	**56**	**535,186.72**	**16.07%**	**26.84%**

EXPENSES BUDGET	Error		Irregularity		OLAF Notified		Total undue payments recovered		Total transactions in recovery context (incl. non-qualified)		% Qualified/Total RC	
	Nbr	Amount	Nbr	Amount	Nbr	Amount	Nbr	Amount	Nbr	Amount	Nbr	Amount
INCOME LINES IN INVOICES												
NON ELIGIBLE IN COST CLAIMS												
CREDIT NOTES									1253	7,067,379.09		
Sub-Total									**1253**	**7,067,379.09**		

GRAND TOTAL	**5**	**21,555.90**	**4**	**122,076.41**			**9**	**143,632.31**	**1309**	**7,602,565.81**	**0.69%**	

TABLE 9: AGEING BALANCE OF RECOVERY ORDERS AT 31/12/2016 FOR JRC						
	Number at 01/01/2016	Number at 31/12/2016	Evolution	Open Amount (Eur) at 01/01/2016	Open Amount (Eur) at 31/12/2016	Evolution
2006	1	1	0.00 %	1,695.40	1,695.40	0.00 %
2009	1		-100.00 %	436.04		-100.00 %
2010	1	1	0.00 %	945.00	945.00	0.00 %
2013	1	1	0.00 %	17,082.00	17,082.00	0.00 %
2014	1	1	0.00 %	15,000.00	15,000.00	0.00 %
2015	77	3	-96.10 %	11,606,430.30	135,157.82	-98.84 %
2016		55			11,592,341.58	
	82	62	-24.39 %	11,641,588.74	11,762,221.80	1.04 %

TABLE 10 : RECOVERY ORDER WAIVERS IN 2016 >= EUR 100.000						
	Waiver Central Key	Linked RO Central Key	RO Accepted Amount (Eur)	LE Account Group	Commission Decision	Comments

Total DG	

Number of RO waivers	

No data to be reported

TABLE 11 : CENSUS OF NEGOTIATED PROCEDURES - DG JRC - 2016

Procurement > EUR 60,000

Negotiated Procedure Legal base	Number of Procedures	Amount (€)
Art. 134.1(b)	10	24,297,329.16
Art. 135.1(a)	5	1,582,711.00
Total	15	25,880,040.99

Additional comments

The information presented in the above table is based on the information from the JRC's financial management tool – JIPSY.

TABLE 12 : SUMMARY OF PROCEDURES OF DG JRC EXCLUDING BUILDING CONTRACTS

External Procedures > € 20,000		
Procedure Type	**Count**	**Amount (€)**
(Ext. act) Service - Competitive Negot.Proc. with at least three candidates without pub.(Art. 265.1(b) & 3 RAP)	1	99,650.00
(Ext. act) Service - International Restricted Procedure with prior publication (Art. 265.1(a)(i) & 2 RAP)	2	872,770.00
(Ext. act) Supply - Local open procedure with prior publication (Art. 267.1(b)(i) RAP)	1	56,339.00
TOTAL	**4**	**1,028,759.00**

Internal Procedures > € 60,000		
Procedure Type	**Count**	**Amount (€)**
Competitive procedure with negotiation (Art. 135 RAP)	1	34,800,000
Exceptional Negotiated Procedure after publication of a contract notice (Art. 135 RAP)	5	1,582,711
Exceptional Negotiated Procedure without publication of a contract notice (Art. 134 RAP)	11	24,383,000
Negotiated Procedure with at least five candidates below Directive thresholds (Art. 136a RAP)	39	3,988,765
Open Procedure (Art. 104(1) (a) FR)	8	4,798,679
Open Procedure (Art. 127.2 RAP)	54	53,065,600
Restricted Procedure (Art. 104(1) (b) FR)	3	10,450,261
Restricted Procedure (Art. 127.2 RAP)	14	39,259,897
TOTAL	**135**	**172,328,912**

Additional comments

The information presented in the above table is based on the information from the JRC's financial management tool – JIPSY.

TABLE 13 : BUILDING CONTRACTS

Total number of contracts :	
Total amount :	

Legal base	Contract Number	Contractor Name	Description	Amount (€)

No data to be reported

TABLE 14 : CONTRACTS DECLARED SECRET

Total Number of Contracts :	
Total amount :	

Legal base	Contract Number	Contractor Name	Type of contract	Description	Amount (€)

No data to be reported

ANNEX 4: Materiality criteria

The objectives of the internal control system are defined in the Financial Regulation (cf. Art. 32). The Authorising Officer by Delegation (AOD) needs to define specific management targets and, in particular, needs to have objective criteria **for determining which weaknesses** should be subject to a formal reservation to his/her declaration.

The JRC considers weaknesses to be either of a quantitative nature i.e. significant errors affecting legality and regularity of the underlying transactions, or of a qualitative nature. Qualitative weaknesses might arise from significant control system weaknesses, significant reputational events which materialised, insufficient audit coverage and/or inadequate information from internal control systems, critical issues reported by the European Court of Auditors (ECA), the Internal Audit Service (IAS) or OLAF.

The materiality criteria related to the JRC's budget and operations are applied to the results of ex ante and ex post controls, exception reporting, reports from authorising officers by sub delegation, reports from authorising officers in other DGs managing budget appropriations in cross-delegation and work done by the IAS and other auditing bodies as well as feedback during the self-assessment of internal control.

Determining specific materiality criteria involves making a judgment in both **qualitative and quantitative terms:**

In **qualitative** terms, when assessing the significance of any weaknesses, the JRC takes the following factors taken into account:

- the nature and scope of the weakness;
- the duration of the weakness;
- the existence of compensatory measures (mitigating controls which reduce the impact of the weakness);
- the existence of effective corrective actions to correct the weaknesses (action plans and financial corrections) which have had a measurable impact.

In **quantitative** terms, in order to make a judgment on the significance of a weakness, the JRC **quantifies** the potential financial impact ("monetary value of the identified problem"/"amount considered erroneous"/"the amount considered at risk") in monetary terms.

Three types of reservations may be associated with the activities of the JRC in case the thresholds set by the materiality criteria are exceeded:

1. Materiality criteria for making a reservation in the context of Financial Management:

The budget managed directly by the JRC each year is around EUR 404 Million. Around 58% of the budget is dedicated to staff costs. The remainder is dedicated to site and infrastructure management and to operational expenses e.g. purchasing equipment. In line with the guidelines annexed to Communication to the Commission, COM 28 of 21 January 2003, the JRC considers that any material loss exceeding 2% of the authorised payments of the reporting year would cause the AOD to make a reservation.

The reservations may be associated with the following financial management activities:

- Payment processing in which significant amounts of funds are inappropriately paid to beneficiaries. These include payments to staff and/or ineligible payments to suppliers.
- Procurement activities which result in a significant loss of funds from the JRC budget. Such activities may be associated with distortion of market conditions and not opening up the market to competition.

- Favouring third parties to work with the JRC in the context of its contractual income operations where for example insufficient amounts are charged by the JRC for its services.
- Reputational events creating lasting damage related to financial operations, including procurement. Reservations will be made if serious cases of fraud occur during the processing of financial transactions.

2. Materiality criteria for making a reservation in the context of the core activities of the JRC:

As the science and knowledge service of the Commission, the JRC has the responsibility to support EU policies with independent evidence throughout the whole policy cycle. Events that risk significantly undermining the credibility and or impartiality of the JRC's scientific results and outputs would be considered as significant reputational events which have materialised that could lead to a reservation being made. This is relevant in cases where such operations would lead to lasting damage to the Commission's image or serious breaches on provisions of the Treaty.

The JRC is accountable for a wide range of administrative and support services. Events that damage the reputation of the European Commission in the long term associated with mismanagement and/or malpractice of the JRC in particular when legal provisions are not respected, would lead to a reservation being made.

The JRC has important responsibilities to ensure the safety and security both of its staff and the population in areas around the research centres. Reputational events occurring as a consequence of serious negligence, breaches in the application of safety legislation or mismanagement, would lead to a reservation being made.

If the JRC was the subject of litigation and subsequently lost a legal case the matter would be assessed to determine whether the reputation of the European Commission had been significantly and adversely affected in the long term, this would lead to a reservation being made.

3. Materiality criteria for making a reservation in the context of Control Systems Weaknesses and Auditing Activities:

The JRC works to ensure that the Commission's internal control standards are implemented effectively. Should one control standard not be sufficiently well implemented, or should there be a serious error in the application of any of the control standards, or any critical issue reported by OLAF, a reservation would be made.

The JRC is periodically audited by the IAS and the ECA. Should a critical recommendation or the combined effect of a number of recommendations rated 'very important' be issued by one of these bodies, a reservation would be issued if the recommendation had led to a significant loss of funds or caused lasting damage to reputation. In any case if the JRC did or could not address a critical recommendation or the combined effect of a number of recommendations rated 'very important' appropriately, or for which there is a significant delay in the implementation of the action plan, a reservation would be made.

ANNEX 5: Internal Control Template(s) for budget implementation (ICTs)

ICT N°1: Procurement in direct management mode

Stage 1 – Procurement

A - Planning

Main control objectives: Ensuring that the decision to tender is optimal

Main risks	Mitigating controls	Estimated coverage frequency and depth	Estimated costs and benefits of controls	Control indicators
The needs are not well defined (operationally and economically) and that the decision to procure was inappropriate Discontinuation of the services provided or delays/extra work in the project execution due to a late contracting	Preparation of detailed procurement planning and regular follow-up via Public Procurement Management Tool (PPMT)	**Coverage:** 100 % of the forecast procurements > EUR 15 000	**Costs:** Estimation of cost of operational and financial staff involved **Benefits:** Rejection of unjustified purchases, avoidance of litigation and compliance with Financial Regulation and Procurement rules	Cost of control on procurement / Total contract value Cost of control on procurement / number of procedures closed during the year
	Note to AO(S)D on justification (economic, operation) for launching a procurement process	**Coverage:** 100% of the forecast procurements		
	Preparation of detailed procurement planning and regular follow-up via PPMT	**Coverage:** 100 % of the forecast procurements > EUR 15 000		
	Continuous monitoring during the call for tender procedure for successful award of the contract and close monitoring of contract execution.	**Coverage:** All key procurement procedures having significant impact on the objectives of the DG		

B - Needs assessment & definition of needs

Main control objectives: Ensuring that the call for tender is optimally done

Main risks	Mitigating controls	Estimated coverage frequency and depth	Estimated costs and benefits of controls	Control indicators
The best offer/s are not submitted due to inadequate market analysis and / or poorly defined technical specifications	Financial circuit (OVA and or AOS approval and supervision of specifications)	**Coverage:** 100 % of the specifications are scrutinised **Depth:** determined by the amount and/or the impact on the objectives of the JRC if it goes wrong	**Costs:** Estimation of cost of operational and financial staff involved **Benefits:** limit the risk of litigation, limit the risk of cancellation of a tender and compliance with Financial Regulation and Procurement rules	Cost of control on procurement / Total contract value Cost of control on procurement / number of procedures closed during the year
	Additional controls namely by procurement staff above the financial threshold of EUR 15 000	**Coverage:** 100 % of procedures > EUR 15 000		
	Public Procurement Advisory Group (PPAG) - ex-ante control	**Coverage:** Threshold (100 % ≥ EUR 500 000 and 100 % of negotiated > EUR 60 000) and random sampling (others > EUR 60 000 < EUR 500 000) **Depth:** depends on the sensitivity. Risk based approach focused in particular on the selection criteria		

C – Selection of the offer & evaluation

Main control objectives: Ensuring that the selection of the contractor is optimal

Main risks	Mitigating controls	Estimated coverage frequency and depth	Estimated Costs and benefits of controls	Control indicators
The most promising offer not being selected, due to a biased, inaccurate or 'unfair' evaluation process	Opening committee and Evaluation committee	**Coverage:** 100 % of the offers analysed **Depth:** all documents transmitted	**Costs**: Estimation of cost of operational and financial staff involved **Benefits:** limit the risk of litigation and fraud, and compliance with Financial Regulation and Procurement rules	Cost of control on procurement / Total contract value Cost of control on procurement / number of procedures closed during the year
	Public Procurement Advisory Group ex-ante control	**Coverage:** Threshold (100 % ≥ EUR 500 000 and 100 % of negotiated > EUR 60 000) and random sampling (others > EUR 60 000 < EUR 500 000) **Depth:** in terms of justification of the draft award decision		
	Opening and Evaluation Committees' declaration of absence of conflict of interest and confidentiality	**Coverage:** 100 % of the members of the opening and the evaluation committees		
Inconsistency between the signed contract, the specifications, the offer, the conclusion of the evaluation committee and the awarding decision	Verification by procurement officers and financial verifying agents and authorising officers	**Coverage:** 100 % checked	**Costs**: Estimation of cost of operational and financial staff involved **Benefits:** avoid contracting with 'excluded' suppliers that would not be able to fulfil the contract requirements	
	Exclusion criteria documented	**Coverage:** 100 % checked **Depth:** required documents		

Main risks	Mitigating controls	Estimated coverage frequency and depth	Estimated Costs and benefits of controls	Control indicators
		provided are consistent		
	Public Procurement Advisory Group ex-ante control	**Coverage:** Threshold (100 % ≥ EUR 500 000 and 100 % of negotiated > EUR 60 000) and random sampling (others > EUR 60 000 < EUR 500 000) **Depth:** depends on the sensitivity Risk based approach focused in particular on the selection criteria		
	Early Warning System (EWS)	**Coverage:** 100 % checked		

Stage 2 – Financial transactions

Main control objectives: Ensuring that the implementation of the contract is in compliance with the signed contract

Main risks	Mitigating controls	Estimated coverage frequency and depth	Estimated costs and benefits of controls	Control indicators
Contractor does not comply with the offer done / signed contract	Monitoring respect of contractual provisions	**Coverage**: 100 % monitored **Depth:** follow-up of the deadlines and the deliverables mentioned in	**Costs:** Estimation of cost of operational and financial staff involved **Benefits:** Detect error before payment, sound	Cost of control on the financial circuit / number of financial transactions Cost of control on the

Main risks	Mitigating controls	Estimated coverage frequency and depth	Estimated costs and benefits of controls	Control indicators
		the contract	financial management and respect of contractual provisions	financial circuit / value of payment executed [3]
Amount paid is disconnected from the quality and the timing of the deliverables	Conform to the fact	**Coverage**: 100 % of transactions	**Costs:** Estimation of cost of operational and financial staff involved **Benefits:** avoid paying undue amounts	
	Financial circuit: all steps financial and operational	**Coverage**: 100 % controlled **Depth:** check of all required documents in the contract		
	Signature at higher senior management level for amounts > EUR 134 000	**Coverage**: 100 % of transactions > EUR 134 000 **Depth:** The depth depends on the risk criteria		
	Sensitive functions	**Coverage**: AOSDs and OIAs mainly		
Risk of late interest payments and discontinuity of business because contractor fails to deliver due to delayed payments.	Close monitoring of every step in the payment process, in particular payment delays	**Coverage**: 100 % of transactions	**Costs:** Estimation of cost of operational and financial staff involved **Benefits:** Sound financial management and respect of contractual provisions	JRC Payments in time (in %) - According to the applicable financial regulation version

[3] Excluded: payments done by the Paymaster's Office (PMO) (mainly related to salaries and business travel), and 'Hors Budget' Payments i.e. payments made to consolidate accounting data.

Stage 3 – Supervisory measures

Main control objectives: Ensuring that any weakness in the procedures (tender and financial transactions) is corrected

Main risks	Mitigating controls	Estimated coverage frequency and depth	Estimated costs and benefits of controls	Control indicators
An error or non-compliance with regulatory and contractual provisions, including technical specifications, or a fraud is not prevented, detected or corrected by ex-ante control, prior to payment	Ex-post controls on procedures / contractors	**Coverage**: Risk based percentage or financial controllers check each other's work once a year **Depth:** review of the procedures implemented (procurement and financial transactions)	**Costs:** estimation of cost of staff involved mainly linked to ex-post controls **Benefits:** Irregular payments detected, issues are followed and addressed and improvement of processes and procedures	Detected error rate from ex-post controls: value of error(s) / total value of payments checked Costs ex post controls / Total value of transactions checked by ex-post Costs ex post controls / total number of transactions checked by ex-post
	Whistle blowing (after yearly reporting of awarded contractors)	**Coverage**: potentially 100 %		
Management of the procurement is not improved in general	Review of ex post results	**Coverage**: 100 % at least once a year **Depth:** look for any systemic problem in the procurement procedure and in the financial transaction procedure and any weakness in the selection process of the ex post controls		
	Review of exception reporting	**Coverage**: 100 % at least once a year **Depth:** look for any		

Main risks	Mitigating controls	Estimated coverage frequency and depth	Estimated costs and benefits of controls	Control indicators
		weakness in the procedures (procurement and financial transactions)		

ICT N 2: Managing Income from Contractual Actions

This ICT applies to income generated by the JRC through providing, under contract, scientific and technical services to customers both within and outside the European Institutions.

Stage 1: Contract Proposal Phase

Main control objectives: Ensuring the JRC only commits to revenue generating operations through contractual contracts when appropriate

Main risks	Mitigating controls	Estimated coverage frequency and depth	Estimated costs and benefits of controls	Control indicators
The risk of carrying out projects which are not in line with the JRC work programme and which do not meet customer expectations, might lead to reputational issues.	Risk assessment carried out on each contractual project proposal and reviewed by management Project check list for each contractual project proposal is subject to management review.	**Coverage:** 100% (risk assessment and project check list for all projects proposals). **Depth:** all documents transmitted	**Costs:** Estimated time taken by responsible scientist and management to prepare and review risk assessment against project proposal value. **Benefits:** Only project proposals with an acceptable level of risk and which are in line with work programme which could meet customer expectations are accepted.	Cost of control on contractual project proposals / Total contractual project proposal value Cost of control on contractual project proposals / Number of proposals selected during the year
	For Commission customers project proposals – high level management review and hierarchical validation	**Coverage:** 100 % (all Commission project proposals). **Depth:** may be determined by the amount and/or the impact on the objectives of the DG if it goes wrong	**Costs:** Estimated time taken by each actor in the management review procedure. **Benefits:** Only project proposals with an acceptable level of risk and which are in line with work programme which could meet customer expectations are accepted.	Total cost of control of management review / Total project proposal value of Support to Commission contracts

Main risks	Mitigating controls	Estimated coverage frequency and depth	Estimated costs and benefits of controls	Control indicators
Financial risk on Third Party Work (TPW) contracts – risk of non-payment by third parties	50% up-front payment is requested on all TPW contracts. Checking and follow-up of receipt of up-front payment by financial officers	**Coverage:** 100% check of receipt of TPW up-front payments.	**Costs:** Estimated time taken by financial officers to request and monitor TPW up-front payment against project value **Benefit**: reduced risk from third party default	Cost of control for up-front payment / Project value of all TPW contracts Rate of default (if any) on TPW contracts
Financial loss due to underestimation of cost of deliverables	Approval of Cost Evaluation Form by Head of Unit.	**Coverage:** 100% (All cost evaluation forms authorised by the Unit Head)	**Costs:** Estimated time for Unit head to approve the project proposal cost evaluation. **Benefit:** Reduced risk of financial loss due to overspending on contractual contracts	Cost of control / Value of cost evaluation form

Stage 2: Contract Preparation Phase

Main control objectives: Ensuring all contractual contracts signed by the JRC for the provision of scientific/technical services meet the appropriate contract standards.

Main risks	Mitigating controls	Estimated coverage frequency and depth	Estimated costs and benefits of controls	Control indicators
Inappropriate contract wording may expose the JRC to additional liability.	Wherever possible standard templates are used. All contracts are checked and verified by	**Coverage:** 100% (all contracts reviewed at the level of the financial officers).	**Cost:** Estimated time taken for the financial officers to verify all contracts.	Cost of control / Total value of contracts signed Total cost of controls / number of contracts

Main risks	Mitigating controls	Estimated coverage frequency and depth	Estimated costs and benefits of controls	Control indicators
	the financial officers and in particular for any deviation from standard clauses, and for any non-standard clauses an opinion of the legal unit may be sought.		**Benefit:** The JRC is not exposed to any additional liability	signed
Failure to properly forecast revenue in the associated initial Forecast of Revenue (FOR) may result in inadequate credit commitments being available.	All FORs are checked by the Financial Initiating Agent (FIA), verified by a financial verifying agent (FVA) and authorised by the authorising officer (AOS) who is also responsible for the legal commitment (i.e. signing the contract).	**Coverage:** 100% as all FOR are checked, verified and authorised (Financial Circuits). **Depth:** The depth depends on the risk criteria	**Cost**: Estimated time of staff involved, (FIA; FVA & AOS). **Benefit**: Elimination of errors on FOR, respect of financial circuits.	Cost of control / Total value of FORs signed Cost of control / number of FORs

Stage 3: Contract implementation phase

Main control objectives: To guarantee the correct financial management of all revenue generating operations through contractual contracts

Main risks	Mitigating controls	Estimated coverage frequency and depth	Estimated costs and benefits of controls	Control indicators
Failure to cash appropriately might lead to financial and reputational loss.	Budget consumption is verified by the financial officers (FIAs) prior to billing the customer.	**Coverage:** 100% (all ROs are checked, verified and authorised). – Financial circuits	**Cost:** Time taken by, FIA, FVA and AOS to verify ROs against the total value of ROs issued.	Total cost of controls / Total value of recovery orders

Main risks	Mitigating controls	Estimated coverage frequency and depth	Estimated costs and benefits of controls	Control indicators
	All Recovery Orders (ROs) are checked by FIA against contract and budget consumption, verified both by the FVA and authorised by the AOS.	**Depth:** The depth depends on the risk criteria	**Benefit:** Correct billing of customers, sound financial management and respect of contractual provisions.	
	Independent audits are systematically carried out For Framework Programme (FP) contracts with a reimbursable value > €375.000	**Coverage:** Independent audits of FP contracts with a reimbursable value > € 375,000 **Depth:** The depth depends on the risk criteria	**Cost:** Total cost of audits. **Benefit:** reduced risk of errors for contracts with a reimbursable value > EUR 375 000, system improvements and compliance with FP provisions.	Costs of audits / Total value of contractual projects audited
Risk of late interest payments and discontinuity of business because contractor fails to deliver due to delayed payments.	Close monitoring of every step in the revenue process, including contractual cashing rates	Coverage: 100 % of RO transactions	**Costs: Cost**: Estimated time of staff involved, (FIA; FVA & AOS). **Benefits:** Sound financial management and respect of contractual provisions	JRC contractual cashing (in %) **-** up to 15% of the institutional budget

ANNEX 6: Implementation through national or international public-sector bodies and bodies governed by private law with a public sector mission (not applicable)

N/A

ANNEX 7: EAMR of the Union Delegations (not applicable)

N/A

ANNEX 8: Decentralised agencies (not applicable)

N/A

ANNEX 9: Evaluations and other studies finalised or cancelled during the year

No used in		Title	Reason [1]	Scope [2]	Type [3]	Associated DGs	Costs (EUR)	Comments [4]	Reference [5]
	I. Evaluations finalised or cancelled in 2016								
	a. Evaluations finalised in 2016								
	JRC Productivity and Impact Evaluation (PRIME)		O	JRC direct actions under Horizon 2020/EURATOM		n.a.	n.a.	To provide regular evaluation based input to the SPP cycle and JRC senior management strategic decision making	Ares(2016)2889992
	JRC work programme ex-ante assessment, pilot exercise		O	JRC direct actions under Horizon 2020/EURATOM		n.a.	n.a.	Optimisation of work programme definition	
		JRC's activities on reference materials (RM)	O	The work and the achievements in the field of (certified) RM, encompassing all RM developed, produced and/or distributed by the JRC including those for nuclear analytical		GROW SANTE ENER ENV RTD AGRI	Total external cost for panel meetings and report: EUR 46000	Strategic assessment of the relevance of the various parts of the JRC's RM programme in a European as well as in an international (global) context.	https://connected.cnect.cec.eu.int/community/jrc/jrc-dg/blog/2016/11/10/evaluation-of-the-jrc-activities-on-reference-materials JRC internal report Ares(2016) 7048305
	b. Evaluations cancelled in 2016								
IES		COPERNICUS Services for soil moisture	O	support to WP SOIL-NACA	O	none	€ 15 000.00	investigate remote sensing data for soil moisture	
	II. Other studies finalised or cancelled in 2016								
	a. Other studies finalised in 2016								
IHCP- 1		STUDY ON health clinics in the EU providing evidence of cure or improvement of quality of life of cancer patients treated via nutritional/dietary measures	O	Support to Health Programme	O	The final report will be provided to DG SANTE for possible future direction	15000.00	fininding study and depending on the results may stimulate further and deeper analysis on this question. This exploratory study is not explicitly mentioned in JRC AWP but is strongly related to work	finalised (not yet registered in ARES)
IHCP- 3		Service contract for support to the EU Action Plan on Childhood Obesity 2014-2020	O	Support to Health Programme	I	DG SANTE (AA with JRC)	15000	To support JRC in the development of evidence-based policy briefs on fruit and vegetable as well as water intake promotion in schools.	ARES(2016)1702422

	b. Other studies cancelled in 2016								
IES-7		Study related to SDGs, SPICE (WP2016)	O	Knowledge gaps in SDG	FC	DEVCO ESTAT CLIMA ENV	40000.00	Depending on decision taken in March 2016	In Q3 2016 a decision was taken not to conduct the planned study with the original scope (focus on knowledge gaps). Consideration is currently being given to conducting a study with a revised focus and for different stakeholders (SG).
IES-8		Socio-economic impact of large scale land transfers	O	specific technical request linked to activity 3.1 of Administrative Arrangement with DEVCO (TS4FNS2)	O	DEVCO	200000.00		This study was not carried out due to a gradual change in priorities and replacement with other activities. In particular we have been able to provide new information on monitoring large scale transfers with Copernicus data (report JRC103309), which lead to a number of follow up activities of high interest to DG DEVCO.
IES-9		Study on Geospatial Aid Application	O	Develop a protocol (proposing tools, methods, experimental actvities) for data provision from the field to be assimilated into the Geospatial Aid	I	AGRI CLIMA	20000.00	Assessment of solutions to simplify and limit farmer's administrative burden. Enhancing rural innovation.	Due to resource reductions, priority was given instead to essential activities for DG AGRI. Credits were used for intramuros contractors rather than for small studies.
IES-10		Study on Land Cover Quantifers	O	Design a set of practical solutions for the identification, interpretation, capture, registration and measurement of agricultural land, greening practices and landscape features (with reference to Article 70(2) of Regulation (EU) 1306/2013, Articles 44, 46 of Regulation (EU) No 1307/2013 and Article 40,	I	AGRI CLIMA	25000.00	These developments and solutions must be compatible with the INSPIRE compliant LPIS core model (LCM) and be framed within the interpretative guidance documents issued by DGAgri (in particular on LPIS, on the ecological focus area (EFA)-layer and on the spot checks (OTSC)	Due to resource reductions, priority was given instead to essential activities for DG AGRI. Credits were used for intramuros contractors rather than for small studies.
IPTS-1		Survey industry/machir	O		n.a.		35000	study on precision agriculture technologies suppliers	The study was cancelled to avoid the overlapping of data as there is already a JRC study on precision farming.
IHCP-3		Service contract for the evaluation and support to JRC for the management of conflict of interest	O	Support to Health Programme	R	DG SANTE (AA with JRC)	150000.00	To support the JRC in the management of conflict of interest for the working groups under the umbrella of the European Commission Initiative on Breast Cancer	On 30 May 2016 the College has adopted a Decision (C (2016) 3301) establishing revised horizontal rules on the creation and operation of expert groups.

ANNEX 10: Specific annexes related to "Financial Management"

This annex is the annex of section 2.1 "Financial management and internal control".

1. **Credits cross-sub-delegated**

- **Cross-sub-delegations received**

The JRC received cross sub-delegated authority to use the budgetary resources of other Directorates General and services of the Commission. Such authorisation is linked to specific research projects or actions. The services and amounts concerned are summarised in the table below.

DG/Service	**Associated Budget in 2016**[4] *(C1 commitment accepted) In EUR 1 000s*	**Nature of Service managed by the JRC**
DG AGRI	0	Assigned to Directorate D for the Union participation at the World Exposition 2015- 'Feeding the Planet - Energy for Life' in Milan.
DG CLIMA	200	Assigned to Directorate D for the Pilot Project "Making efficient use of EU climate finance: using roads as an early performance indicator for REDD+ projects"and for project "LUCAS samples – Analysis".
DG DEVCO	0	Assigned to Directorate D for the Project "NEPAD African Network of Centres of Excellence on Water Sciences and Technology (II phase)"
DG DIGIT	983	Assigned to Directorate B for Action 1.17 "Reusable INSPIRE Reference Platform", Action 2.13 " EULF" and Action 10 "ELISE".
DG ENER	507	Assigned to Directorate G for "Technical support to operation of the OSL at Sellafield and the LSS at La Hague" and "Operation of the OSL at Sellafield and the LSS at La Hague; Compucea Missions".
DG ENV	240	Assigned to Directorate D for the project "LUCAS samples – Analysis".
DG GROW	10.776	Assigned to Directorate D and Directorate E for the programme "Copernicus".

[4] When the budget is zero, it means that no C1 commitments were accepted in 2016 but RAL management only

DG MARE	n.a. (*)	Assigned to Directorate D to enter into legal commitments in the context of production of scientific advice by the Scientific, Technical and Economic Committee for Fisheries (STECF). (*)This sub-delegation is limited to the signature of legal commitments, no budgetary sub-delegation was given. The JRC organises the committee meetings including the expert invitations. Payments are executed by DG MARE and the PMO. The IR (art 4.1) specifically allows for the AOSD to be different in case of provisional commitments. In this case, both the commitments on the global envelope and on the operational line are provisional commitments.
DG NEAR	90	Assigned to Directorate A for the "TAC – Travel Accommodation and Conference facility for Western Balkans and Turkey".
DG RTD	0	Assigned to Directorate B for the project "Research and Innovation Observatory".

Table A10-1: Cross Sub-Delegations received

- **Cross-sub-delegations given**

The JRC has provided sub-delegations to other Directorate Generals of the European Commission for the following budget lines:

- 10 02 01 "Horizon 2020 — Customer-driven scientific and technical support to Union policies".

DG/Service	**Associated Budget in 2016** *(C1 commitment accepted) In EUR 1 000s*	**Nature of Service managed by the Other Services**
DG ESTAT	0	Contribution of the JRC to the purchase and annual update of geographic database

Table A10-2: Cross Sub-Delegations given

- **Co-delegations**

The JRC has put in place Horizontal co-delegations[5] (art. 3.2 of the Internal Rules) with other Directorate Generals of the European Commission for the following budget lines:

- 10 01 05 "Support expenditure for operations of Direct research, policy area"

- 05 07 01 02 "Monitoring and preventive measures — Direct payments by the Union"

- 05 08 03 00 "Restructuring of systems for agricultural surveys"

[5] In accordance with Art. 3.2 of the Internal Rules (Decision C(2015) 1423 final of 05/03/2015 on the Internal Rules on the implementation of the general budget of the European Union (European Commission section) for the attention of the Commission department)

DG/Service	**Associated Budget in 2016** *(C1 commitment accepted) In EUR 1 000s*	Nature of the Co-delegated Service
DG AGRI[6]	9.130	Control with Remote Sensing Programme - Acquisition of satellite imagery under the 2016 Control with Remote Sensing (CwRS) work programme and their free of charge supply to the MS
DG AGRI	2.422	AGRI4CAST project – Implementation of the Operational MARS Crop Yield Forecasting System, The project results in the production of monthly MARS Bulletins, bi-weekly briefings on agro-meteorological conditions to AGRI, and additional ad-hoc analyses upon request
DG BUDG	94	Contribution to DG BUDG Services related to ABAC
DG DIGIT	939	Contribution to DG DIGIT for IT services foreseen in the MoUs
DG DGT	22	Contribution of the JRC to DGT Translation Services
DG HR	178	The JRC social costs in Ispra managed by the Medical Services
DG HR	398	Contribution to the cost of the Medical Services in the sites
OIB	396	Contribution to the Ispra costs related to canteen & cafeteria, childcare and lodging managed by OIB
PO	379	Contribution of the JRC to PO Publication Services

Table A10-3: Horizontal Co-Delegations given

The JRC has put in place Vertical co-delegations (art. 3.2 of the Internal Rules) with other Directorate Generals of the European Commission for the following budget lines:

- 10 01 05 "Support expenditure for operations of Direct research, policy area"

[6] The two co-delegations with DG AGRI are Horizontal Co-Delegation type I (Art. 3.2 of the Internal Rules) for which the Fund Management Centre in ABAC is "JRC" and as a result appear in Tables 1 to 3 of Annex 3 even though the budget title is DG AGRI's (i.e. 05) and not JRC (i.e. 10).

DG/Service	**Associated Budget in 2016** *(C1 commitment accepted)* *In EUR 1 000s*	**Nature of Co-Delegated Service**
DG HR	0	Payment of Interim staff in Brussels
PMO	0	Payments of core and contractual staff expenditure

Table A10-4: Vertical Co-delegations given

2. Expenditure operations

The JRC carries out its expenditure operations through procurement operations. An internal control template (ICT) covering JRC's procurement is available in Annex 5 of this AAR.

The table below depicts the type of procurement procedures larger than EUR 60 000 carried out during 2016. Due to the intrinsic nature of its operations, the JRC has a higher than normal proportion of negotiated contracts.

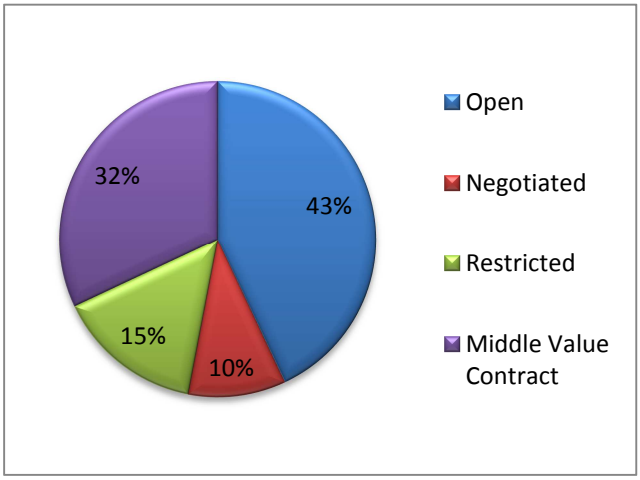
Management mode: Direct centralised **Key figures:** • There were 171 large value (> EUR 60 000) contract tenders valued at approximately EUR 214 million[7] • 10% of the files were awarded through negotiated procedure.	

Table A10-5: Procurement procedures (> EUR 60 000) carried out in 2016

3. Revenue operations

The JRC has a mandate to carry out revenue generating operations through contractual activities, which is enshrined in a series of Council Decisions and Resolutions:

- The Council Resolution of 29 June 1988 introduced the concept of competitive activities *(currently called contractual activities)* performed by the JRC for third parties and in support of the Commission. It clearly differentiated between the JRC's institutional task of executing specific research programmes and its work for 'other Commission services and for third parties'.

[7] The amount of EUR 214 Million is higher than the annual budget because the associated contracts run over several years.

- The Council Decision of 3 May 1989 formalises the concept of the JRC performing third party and support to the Commission activities and clearly indicates that this will be 'against payment'.
- The idea is further developed in the Council Resolution of 29 April 1992 in which the Council indicates that it 'considers that the JRC should further optimize the use of available staff and equipment in fields where it has the competence and should, in addition to its task of executing specific research programmes and exploratory research, seek to pursue its work of providing services'.
- In the Council conclusions of 26 April 1994 on the role of the Joint Research Centre the Council reaffirms that the JRC must 'pursue and reinforce its move towards a more contractual approach on the basis of a genuine customer/contractor relationship' according to a set of guidelines provided in annex to the conclusions.

Contractual activities *(formerly called competitive activities)* may be defined as the provision by the JRC of scientific and technical services to other bodies both within the European Institutions and for third parties. Three distinct types of contractual activities exist:

1. Support to Commission services

   Support actions carried out by JRC for other Commission services for work that is additional or complementary to the institutional Work Programme. An Administrative Arrangement (AA) is negotiated with the other Commission DG setting out the legal, financial and technical framework of the support to be offered.

2. Indirect Actions within the scope of the research framework programmes

   Indirect Actions are calls for proposal launched by the research family DGs, or their agencies, within the scope of Research Framework Programmes. The JRC participates under the same conditions and with the same rights and obligations as any other research body.

3. Third Party Work

   Third Party Work is carried out for clients outside the Commission and in accordance with the Council Decision of 1989 and with Article 183 FR and Article 256 RAP for the JRC, allowing the JRC to provide services to third parties.

Table A10-6 below depicts the contractual contracts signed during 2016, the type and their value.

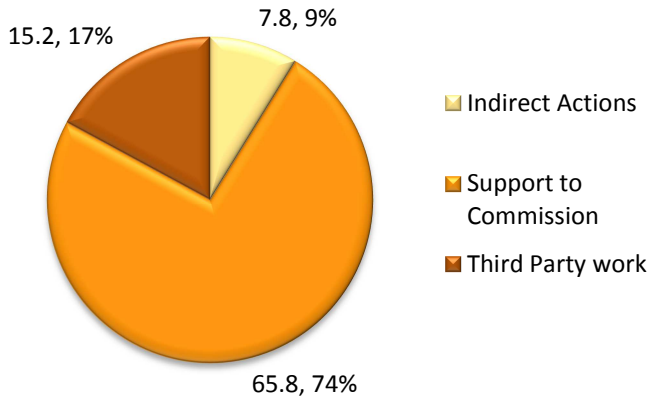
Management mode: Direct centralised **Key figures:** • 246 contractual contracts were signed in 2016 with a value of EUR 88.8 million • EUR 88.8 million of contractual income was cashed in 2016 • Support to Commission services are the main source of income	

Table A10-6: Contractual contracts signed by the JRC in 2016

The additional income generated through contractual activities is used for purchasing scientific equipment and services, hiring temporary staff, and for financing part of the JRC's infrastructure used for these tasks. An ICT covering the JRC's income from contractual activities is available in Annex 5 of this AAR.

4. JRC Financial Circuits and Segregation of Duties[8]

Basic principles

- **Four eyes principle/Segregation of duties**: before an operation is authorised, all aspects of this operation (both operational and financial) have to be verified by at least one member of staff other than the one(s) who initiated the operation. Therefore, the initiating and verifying function on one side, and the initiating and authorising function on the other side, can never be combined (Art. 66.5 FR).

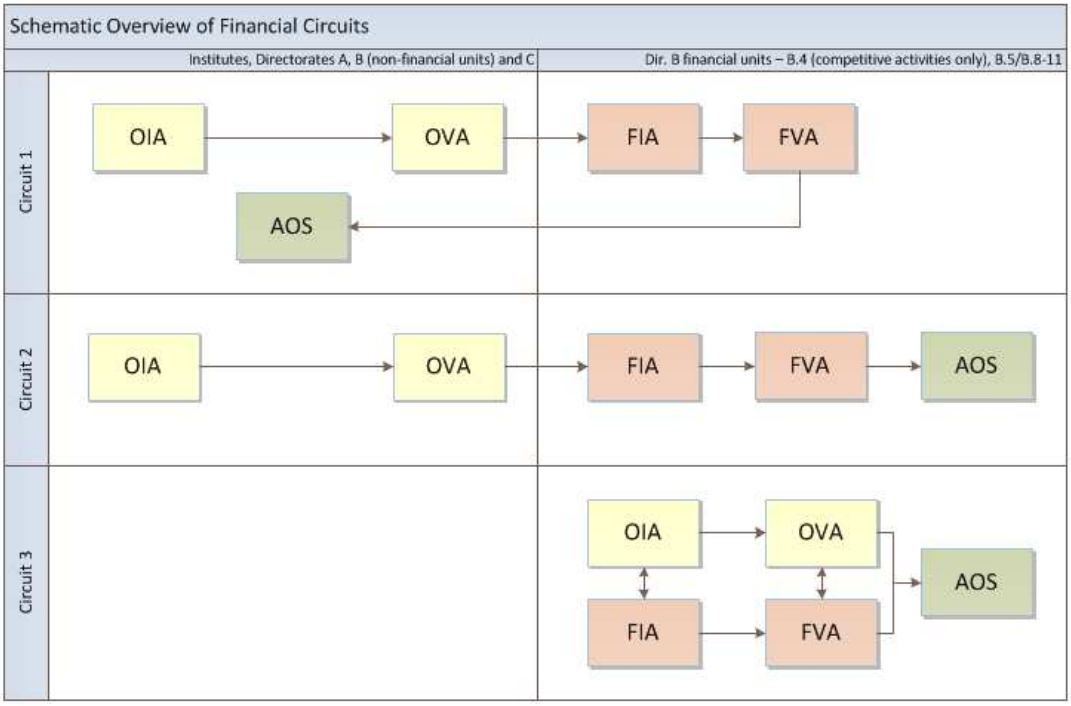
- **Independence of the verifier**: the person executing the verifying function for an operation cannot be in a subordinated role to the person who initiates this operation (Art. 66.5 FR).

- **Single signature**: except in well-defined cases (as defined in Art. 97 RAP) the budgetary and legal commitment relating to the same transaction has to be signed by the same authorising officer.

Basic circuits

The AOD can decide on the Financial Circuit(s) to be applied for the transactions under his/her responsibility. At the JRC, the type of financial circuits chosen is determined by the nature of the financial transaction which is undertaken, as well as by geographical considerations. In any event, all staff having the role of financial agents, Financial Initiating agent (FIA) and Financial Verifying agent (FVA). are based in the Financial Units of the Resources Directorate. A schematic representation of the JRC circuits can be shown as follows:

[8] Extract from the "JRC Financial Circuits and Segregation of Duties" (Ref. Ares(2015)3238388)



Circuit 1 is the model which is used for the majority of transactions at the JRC. In this model there is a clear segregation between the operational and financial roles, respectively, and FIA/FVA are hierarchically independent from the AOS. It concerns transactions relating to:

- Scientific activities.
- Site management such as infrastructure and maintenance.
- Decommissioning activities.
- Centrally managed operations (<€134.000), such as training, informatics, communication etc.
- Income-generating transactions (Forecasts of Revenue, Recovery Orders).

In case of transactions <€134.000 managed by the Directorates involving two or more actions from the same Directorate, the AOS will be the Head of the Unit in which the OIA is placed. The other Unit Heads are to be appropriately involved in the workflow.

Circuit 2 is used when the operational actors are situated in a different unit than the financial actors, the AOS being a hierarchical superior to the FIA and the FVA. It can cover the following transactions:

- Activities managed within the Resources Directorate for an amount ≥€134.000 (in these cases the AOS is the Resources Director).
- Activities involving more than one Directorate, where OIA and OVA are situated in Directorates other than the Resources Directorate.
- Low-risk transactions (e.g. validation of payment orders for reimbursement of candidates/experts).
- Mass upload for payments (applied for Grantholder and trainee salary payments, reimbursements of candidates or experts). The workflow can represent a variation to circuit 2 in the sense that the OVA function can be carried out in the financial unit.

Circuit 3 is applied where all operational and financial initiating and verifying functions are carried out within one or more units within the Resources Directorate, the AOS being

the hierarchical superior of the Operational and/or Financial Agents. It can cover the following transactions:

- Activities on administrative or staff-related budget lines.
- Activities of primarily technical nature on scientific budget lines (e.g. decommitment operations for low amounts, GL account re-booking, re-booking of amounts within a commitment, FDI extension, negative payment/repayment, correction of recovery context).
- Activities of primarily technical nature related to revenue (e.g. De-forecast and reforecast for guarantee funds (multi institute), budgetary shifts during a contract (multi institute), GL account corrections (multi institute), De-forecast at end of contract).

Depending on the risk involved as well as the complexity of the transaction being processed, this circuit allows for the number of financial agents to be reduced to a minimum of two persons: one person combining the OIA/FIA responsibilities, and a second combining the OVA/FVA/AOS responsibilities.

In some cases, an additional verification function can be carried out by an agent from a different unit. This is for example the case for purchases of IT goods/services, where such additional verification is formalised in the financial system through validation by a central IT Resources Manager (IRM).

5. Reporting on Financial Management outputs for the year

Overarching objective: The Authorising Officer by Delegation should have reasonable assurance that resources have been used in accordance with the principles of sound financial management, and that the control procedures put in place give the necessary guarantees concerning the legality and regularity of the underlying transactions including prevention, detection, correction and follow-up of fraud and irregularities.

Objective 1: Effective and reliable internal control system giving the necessary guarantees concerning the legality and the regularity of the underlying transactions		
Indicator 1: Estimated error rate **Source of data:** Internal		
Baseline (31/12/2015)	Target	Latest known results (31/12/2016)
0.04% - Residual error rate (RER)	Below the JRC's materiality criteria of 2% per year until 2020.	0.5% - Average error rate (AER) The JRC's detected error rate for 2016 is 0% which confirms the positive the trend of the past years and indicating that there are no issues concerning the JRC's legality and regularity of the underlying transactions. Nonetheless, to estimate the AER the JRC took a most conservative and prudent approach and estimated it to be at

		0.5% i.e. using the ECA's average error rate for the administrative expenditure.
Indicator 2: Estimated overall amount at risk for the year for the entire budget under JRC responsibility **Source of data:** Internal		
Baseline (31/12/2015)	Target	Latest known results (31/12/2016)[9]
EUR 0.1 million	Amount at risk below the JRC's materiality criteria of 2% of the total budget per year until 2020.	EUR 1.03 million – when taking into account the payments authorised by the JRC i.e. excluding salary payments made by the PMO. This value is higher than the 2015 baseline due to the fact that the JRC has used a most conservative and prudent approach than 2015 when estimating its average error rate as described in Indicator 1 above. EUR 2.3 million – when taking into account the payments authorised by the JRC and including the salary payments made by the PMO (as per AAR Annex 3 Table 2). This value is higher than the 2015 baseline due to the fact that it the payments include salary figures which are not included in the 2015 baseline and because the JRC has used a most conservative and prudent approach than 2015 when estimating its average error rate as described in Indicator 1 above.
Indicator 3: Estimated future corrections **Source of data:** DG BUDG and Internal		
Baseline (31/12/2015)	Target	Latest known results (31/12/2016)[10]
EUR 0.05 million	100% recoveries and correction of specific errors	EUR 0.04 million (when excluding salary payments made by the PMO) EUR 0.09 million (when including salary payments made by the PMO)
Indicator 4: Proportion of exceptions **Source of data:** Internal		
Baseline	Target	Latest known results

[9] The reader is referred to Part 2 of the AAR specifically Table 2.1.1.1-2 (Estimated overall amount at risk at closure) and the related footnotes for more explanation about Indicator 2's latest known results.

[10] The reader is referred to Part 2 of the AAR specifically Table 2.1.1.1-2 (Estimated overall amount at risk at closure) and the related footnotes for more explanation about Indicator 3's latest known results.

(31/12/2015)		(31/12/2016)
0.27%	< 1% of transactions per year	0.28% The exceptions and non-compliance events amount to 0.28% of the total number of transactions, meeting the target set of less than 1% of transactions subject to exception). To put the exception reporting into context, the JRC dealt in 2016 with 30 798 transactions and most of them were payments: 23 872.
Indicator 5: Quality of procurement procedures submitted to the PPAG **Source of data:** Internal		
Baseline (31/12/2015)	Target	Latest known results (31/12/2016)
95%	Target of ≥95% per year	96% In 2016, 78 files were screened by the PPAG, representing a value of approximately EUR 205 Million. In the vast majority of cases, 75 files (96%), this scrutiny resulted in a favourable opinion being issued, which confirms the positive trend in the past years and the level of quality of the JRC's procurement procedures submitted to the PPAG.
Main outputs in 2016:		
The JRC has produced various initiatives in the area of finance and procurement operations to ensure that that it has in place an effective and reliable internal control system which gives the necessary guarantees concerning the legality and the regularity of underlying transactions. In the frame of exchange of best practise and awareness-raising activities, during 2016 three network meetings were organised with the finance and procurement community all JRC sites. These structured meetings allowed for useful discussions and exchange of best practices as well as for the dissemination of important points of information. During the last quarter of the year workshops with operational and financial actors were carried out across all JRC sites aimed at identifying areas for simplification in financial management. The outcome of these meetings were discussed by the finance community and an action plan was presented and approved by management, which now forms the basis of the work for 2017 for further increasing the efficiency and effectiveness of the expenditure operations. New developments of the JRC's Public Procurement Management Tool (PPMT) contributed to further automation of activities in the JRC procurement process: ex ante publicity for negotiated low and middle value contracts, population of procurement templates, automated checks and controls in procedure preparation and execution. The management of PPMT was brought under the new JRC project, Procurement Information Systems Management (PRISMA), which aims to provide a centralised first-line user support for all applications used in the JRC procurement process. A one-stop-shop information portal on all procurement tools was developed and made part of the JRC Intranet. Through a series of bilateral meetings with the different procurement teams the PRISMA team gathered first-hand user feedback and suggestions and set up an action plan for their implementation. Thanks to the action plan, already implemented for most of its part, the PRISMA project introduced a number of significant improvements in PPMT		

and the other procurement tools with concrete benefits for the JRC procurement community.

Objective 2: Effective and reliable internal control system in line with sound financial management.			
Indicator 1: Conclusion reached on cost effectiveness of controls – Area 'Procurement' **Source of data:** Internal			
Baseline 2015	**Target 2016**		**Latest known results 2016**
Yes	Yes		Yes – To reach this conclusion the JRC analysed the evolution of the efficiency and cost-effectiveness indicators from 2015 to 2015, and took into account also the results obtained in 2014.
Indicator	**Baseline (31/12/2015)**	**Target 2016**	**Latest known results (31/12/2016)**[11]
1 – Overall cost of control (%)	5.84%	<6%	6.56%
1(a) – Cost of controls of the procurement stage up to selection of the offer and evaluation	1.98%	<4%	2.11%
1(b) – Cost of controls of the financial transaction	3.49%	<4%	3.71%
1(c) – Cost of supervisory measures (ex-post controls)	0.15%	<0.4%	0.34%
Indicator 2: Conclusion reached on cost effectiveness of controls – Area 'Contractual Income' **Source of data:** Internal			
Baseline 2015	**Target 2016**		**Latest known results 2016**
Yes	Yes		Yes - To reach this conclusion the JRC analysed the evolution of the efficiency and cost-effectiveness indicators from 2015 to 2015, and took into account also the results obtained in 2014.

[11] The reader is referred to Part 2.1.1.2 of the AAR for details about the indicator values.

Indicator	Baseline (31/12/2015)	Target 2016	Latest known results (31/12/2016)[12]
1 – Overall cost of control (%)	0.36%	≤0.3%	0.3%

Indicator 3: Implementation of Internal Control Standards in the JRC **Source of data:** Internal		
Baseline (31/12/2015)	Interim milestone (2016)	Latest known results (31/12/2016)
3.5	3.5	3.4 The indicator's numerical value represents the weighted average of the results of the survey that was carried out in 2016 to assess the staff perception of the degree of implementation of the Internal Control Standards in the JRC and to appraise if the internal control systems are effective. The 2016 value of 3.4 is slightly lower than the target set and the 2015's value of 3.5. However, there is a 6% improvement for this indicator when compared to the 3.2 achieved in both 2014 and 2013. This evidences a rather stable situation with respect to staff perception of the degree of implementation of the internal control standards in the JRC. The average score as well as the breakdown of the results for each question of the survey is given in Figure B-4 of the Executive Summary

Indicator 4: Timeliness of payments **Source of data:** Internal		
Baseline (31/12/2015)	Target	Latest known results (31/12/2016)
94%	Target of ≥95% per year	93.3% A lower value than the target and the decrease compared to 2015 the is mainly due to the JRC's reorganisation which took place at the end of June and which had a significant impact on the related budget lines in July 2016. Nonetheless constant efforts are made to ensure that the vast majority of the payments are made within the legal time limits.

Indicator 5: Contractual income **Source of data:** Internal		
Baseline (31/12/2015)	Target (2020)	Latest known results (31/12/2016)
18.9%	15%	24.11% The contractual cashing indicator (as a percentage of the institutional budget[13]) has increased from 18.9%

[12] The reader is referred to Part 2.1.1.2 of the AAR for details about the indicator value.

[13] The institutional budget means "budget for JRC (direct actions) under the Framework Programme for Research

		of last year to 24.11%, which is significantly higher than the target of 15% and clearly evidencing the efficiency of the controls performed.

Objective 3: Minimisation of the risk of fraud through application of effective anti-fraud measures, integrated in all activities of the JRC, based on the JRC's anti-fraud strategy (AFS) aimed at the prevention, detection and reparation of fraud.		
Indicator 1: Updated anti-fraud strategy of the JRC, elaborated on the basis of the methodology provided by OLAF. **Source of data:** Internal		
Baseline	Target	Latest known results 2016
December 2013[14]	Update every 2 to 3 years, as set out in the AFS	The update of the JRC's anti-fraud strategy has been carried forward to 2017 due to internal resources constraints and other priorities. It is important to note that the current action plan is still ongoing and monitored and as part of the JRC annual risk assessment exercise, no new fraud risks have been identified.
Indicator 2: Regular measurement of the ethical climate and the fraud awareness for target population(s) as identified in the JRC's AFS. **Source of data:** Internal		
Baseline (31/12/2015)	Target (2020)	Latest known results (31/12/2016)
- All staff – 4.08 - Management – 4.59 - Staff (other than management) -3.8	Ethical climate rating 4.5 on a scale 1 (disagree) to 5 (agree)	- All staff – 4.15 - Management – 4.57 - Staff (other than management) -3.91 The results clearly show a rather positive evolution and impact of the anti-fraud and ethics awareness campaign ongoing at the JRC.
Indicator 3: Regular monitoring of the implementation of the anti-fraud strategy and reporting on its result to management. **Source of data:** Internal		
Baseline (31/12/2015)	Target (2020)	Latest known results (31/12/2016)
Once per year	Twice per year	Monitored regularly throughout the year and formal reporting at least once per year

[14] Year of first launch

ANNEX 11: Specific annexes related to "Assessment of the effectiveness of the internal control systems"

N/A

ANNEX 12: Performance tables

General objective 1:

A New Boost for Jobs, Growth and Investment

1. Impact indicator: Percentage of EU GDP invested in R&D (combined public and private investment)
Source of the data: Eurostat[15]

Baseline (2012)	**Latest known value** (2014 - provisional)	**Target** (2020) Europe 2020 target
2.01%	2.03%	3%

2. Impact indicator: Employment rate population aged 20-64
Source of the data: Eurostat

Baseline (2014)	**Latest known value** (2015)	**Target** (2020) Europe 2020 target
69.2%	70.1%	At least 75%

6. Impact indicator: GDP growth
Source of the data: Eurostat

Baseline (2014)	**Latest known value** (2015)	**Target** (2020)
1.6%	2.2%	Increase

9. Impact indicator: Resource productivity: Gross Domestic Product (GDP, €) over Domestic Material Consumption (DMC, kg)
Explanation: The indicator focuses on the sustainability of growth and jobs.
Source of the data: Eurostat

Baseline (2010 – Eurostat estimate)	**Latest known value** (2015 – provisional, Eurostat estimate)	**Target** (2020)
1.8 €/kg (EU-28)	2 €/kg (EU-28)	Increase

Completed evaluations: Internal evaluation PRIME 2016 completed
H2020 interim evaluation to be performed in the first semester 2017

Specific objectives 1.1 to 1.9 (contributing to H2020 Specific Objective 17):
A well-informed European policy-making, appropriately and timely supported by the JRC through the provision of high quality and innovative scientific and technical studies, tools, data, materials, models and standards, in the following areas:

Related to spending programme(s) H2020

(Specific objective 1.1) Agriculture and Rural Development
(Specific objective 1.2) Education, Culture, Youth and Sport
(Specific objective 1.3) Environment
(Specific objective 1.4) Maritime Affairs and Fisheries
(Specific objective 1.5) Health and Food Safety
(Specific objective 1.6) Regional Policy
(Specific objective 1.7) Research, Science and Innovation
(Specific objective 1.8) Transport
(Specific objective 1.9) Employment, social affairs, skills and

[15] Please note that Eurostat periodically revises its published data to reflect new or improved information, also for previous years. The latest published data is available by clicking on "bookmark". The "latest known value" column reflects the data that was available at the time of the preparation of the AARs 2016 and it is the reference point for the AARs of Commission services.

labour mobility			
Result indicator 1: Proportion of achieved planned policy deliverables - Number of planned policy deliverables achieved[16] in year N / total number of policy deliverables planned for year N **Source of data**: JRC internal indicator (based on Pubsy/JPB data)			
Baseline (2015)	**Interim Milestone**	**Target**	**Latest known results**
88%	>88%	>88%	98%
Result indicator 2: Weighted average of overall customer satisfaction **Source of data**: JRC internal indicator (based on Pubsy data)			
Baseline 2016	**Interim Milestone**	**Target**	**Latest known results**
phased-in in 2016 for testing	N/A	N/A	N/A To be launched in April 2017
Completed evaluations: Internal evaluation PRIME 2016 completed H2020 interim evaluation to be performed in the first semester 2017			

Main outputs in 2016:			
Policy–related outputs /expenditure outputs[17]			
Description (detailed description in Annex 15 below)	Indicator	Target date	Latest known results (situation on 31/12/2016)
Outputs in the area of "Agriculture and Rural Development": - Agro-Economic Modelling Tools Inform A More Sustainable Agriculture Policy	Policy related outputs	Throughout 2016	69
Outputs in the area of "Education, Culture, Youth and Sport": - Competence Frameworks To Improve Education And Learning	Policy related outputs	Throughout 2016	16
Outputs in the area of "Environment": - First-Ever Global Soil Biodiversity Atlas	Policy related outputs	Throughout 2016	190
Outputs in the area of "Maritime Affairs and Fisheries": - Bioeconomic Modelling for Fisheries	Policy related outputs	Throughout 2016	59

[16] A planned deliverable is considered "achieved" when it has at least one linked output registered in Pubsy or present in the Pubsy workflow.

[17] For the JRC, the distinction policy-related outputs and expenditure outputs is not relevant as all policy-related outputs are expenditure outputs, given that the JRC activities are funded by a spending programme.

Outputs in the area of "Health and Food Safety": - Screening Methodology Helps To Identify Endocrine Disruptors	Policy related outputs	Throughout 2016	76
Outputs in the area of "Regional Policy": - Smart Specialisation Platforms Support Regional Cooperation And Investment **-** JRC Launches Knowledge Centre For Territorial Policies	Policy related outputs	Throughout 2016	58
Outputs in the area of "Research, Science and Innovation": - Rio Country Reports Identify Key Research And Innovation (R&I) Challenges - Attracting R&D Investment From Multinationals	Policy related outputs	Throughout 2016	108
Outputs in the area of "Transport": - 3.5. Smarter digital tachographs strengthen road safety	Policy related outputs	Throughout 2016	45
Outputs in the area of "Employment, social affairs, skills and labour mobility": - Collaborative Economy: A Research Agenda For Policy Support - Key Enabling Technologies For Growth And Jobs	Policy related outputs	Throughout 2016	16

General objective 3:

A Resilient Energy Union with a Forward-Looking Climate Change Policy

11. Impact indicator: Greenhouse gas emissions (index 1990=100)
Source of the data: European Environmental Agency

Baseline (2013)	**Latest known value** (2014)	**Target** (2020) Europe 2020 target
80.2	77.1	At least 20% reduction (index ≤80)

12. Impact indicator: Share of renewable energy in gross final energy consumption
Source of the data: Eurostat

Baseline (2013)	**Interim Milestone**		**Latest known value** (2014)	**Target** (2020) Europe 2020 target
	(2015/2016)	(2017/2018)		
15%	13.6%	15.9%	16%	20%

13. Impact indicator: Increase in energy efficiency – Primary energy consumption
Source of the data: Eurostat

Baseline (2013)	**Latest known value** (2014)	**Target** (2020) Europe 2020 target
1 569.1 million tonnes of oil equivalent (Mtoe)	1 507.1 million tonnes of oil equivalent (Mtoe)	20% increase in energy efficiency (No more than 1 483 Mtoe of primary energy consumption)
14. Impact indicator: Increase in energy efficiency – Final energy consumption **Source of the data**: Eurostat		
Baseline (2013)	**Latest known value** (2014)	**Target** (2020) Europe 2020 target
1 106.2 million tonnes of oil equivalent (Mtoe)	1 061.2 million tonnes of oil equivalent (Mtoe)	20% increase in energy efficiency (No more than 1 086 Mtoe of final energy consumption)
Completed evaluations: Internal evaluation PRIME 2016 completed H2020 and Euratom interim evaluations to be performed in the first semester 2017		

Specific objectives 3.1 to 3.3 (contributing to H2020 Specific Objective 17 and to EURATOM Research & Training Programme Specific Objectives 9, 10, 11, 12 and 13): **A well-informed European policy-making, appropriately and timely supported by the JRC through the provision of high quality and innovative scientific and technical studies, tools, data, materials, models and standards, in the following areas:** **(Specific objective 3.1) Climate Action** **(Specific objective 3.2) Energy** **(Specific objective 3.3) Safe, secure and sustainable use of the nuclear energy**	Related to spending programmes: H2020 and Euratom

Result indicator 1: Proportion of achieved planned policy deliverables - Number of planned policy deliverables achieved[18] in year N / total number of policy deliverables planned for year N
Source of data: JRC internal indicator (based on Pubsy/JPB data)

Baseline 2015	**Interim Milestone**	**Target**	Latest known results (situation on 31/12/2016)
77%	>77%	>77%	92%

Result indicator 2: Weighted average of overall customer satisfaction
Source of data: JRC internal indicator (based on Pubsy data)

Baseline 2015	**Interim Milestone**	**Target**	Latest known results (situation on 31/12/2016)
phased-in in 2016 for testing	N/A	N/A	N/A To be launched in April 2017

Completed evaluations: Internal evaluation PRIME 2016 completed
H2020 and Euratom interim evaluations to be performed in the first semester 2017

[18] A planned deliverable is considered "achieved" when it has at least one linked output registered in Pubsy or in the Pubsy workflow.

Main outputs in 2016:			
Policy–related outputs /expenditure outputs[19]			
Description (detailed description in Annex 15 below)	Indicator	Target date	Latest known results (situation on 31/12/2016)
Outputs in the area of "Climate Action": - Paris Pledges Insufficient To Meet 2 C, According To The Jrc Experts - Covenant Of Mayors – A Local Approach To Global Warming - Global Co2 Emissions From Fossil Fuels And Industrial Processes Stall - Independent Greenhouse Gas Verification - Improving Air Quality In Urban Areas - New Commission Online Tool To Measure Car Journey Fuel Costs And Co2 Emissions	Policy related outputs	Throughout 2016	39
Outputs in the area of "Energy": - Sustainable Energy Security - EU Leaders In Solar Energy Capacity, But There Are Fewer New Installations - Clean Energy For All Europeans	Policy related outputs	Throughout 2016	95
Outputs in the area of "Safe, secure and sustainable use of the nuclear energy ": - Promoting Education And Training For Nuclear Decommissioning	Policy related outputs	Throughout 2016	203

General objective 4: A Deeper and Fairer Internal Market with a Strengthened Industrial Base		
16. Impact indicator: Gross value added of EU industry in GDP **Source of the data**: Eurostat		
Baseline (2014)	**Latest known value** (2015)	**Target** (2020)
17.1%	17.3%	20%
17. Impact indicator: Intra-EU trade in goods (% of GDP) **Source of the data**: Eurostat		

[19] For the JRC, the distinction policy-related outputs and expenditure outputs is not relevant as all policy-related outputs are expenditure outputs, given that the JRC activities are funded by a spending programme.

Baseline (2014)	Latest known value (2015)	Target (2020)
20.4%	20.4%	Increase

Completed evaluations: Internal evaluation PRIME 2016 completed
H2020 interim evaluation to be performed in the first semester 2017

Specific objectives 4.1 to 4.3 (contributing to H2020 Specific Objective 17):
A well-informed European policy-making, appropriately and timely supported by the JRC through the provision of high quality and innovative scientific and technical studies, tools, data, materials, models and standards, in the following areas:
(Specific objective 4.1) Internal Market, Industry, Entrepreneurship and SME
(Specific objective 4.2) Intellectual Property Rights
(Specific objective 4.3) Customs policy and the fight against fraud

Related to spending programme: H2020

Result indicator 1: Proportion of achieved planned policy deliverables - Number of planned policy deliverables achieved[20] in year N / total number of policy deliverables planned for year N
Source of data: JRC internal indicator (based on Pubsy/JPB data)

Baseline (2015)	Interim Milestone	Target	Latest known results (situation on 31/12/2016)
85%	>85%	>85%	100%

Result indicator 2: Weighted average of overall customer satisfaction
Source of data: JRC internal indicator (based on Pubsy data)

Baseline 2016	Interim Milestone	Target	Latest known results (situation on 31/12/2016)
phased-in in 2016 for testing	N/A	N/A	N/A To be launched in April 2017

Planned evaluations: Internal evaluation PRIME 2016 completed
H2020 interim evaluation to be performed in the first semester 2017

Main outputs in 2016:

Policy–related outputs /expenditure outputs[21]

Description (detailed description in Annex 15)	Indicator	Target date	Latest known results (situation on 31/12/2016)
Outputs in the area of "Internal	Policy related	Throughout	197

[20] A planned deliverable is considered "achieved" when it has at least one linked output registered in Pubsy or in the Pubsy workflow.

[21] For the JRC, the distinction policy-related outputs and expenditure outputs is not relevant as all policy-related outputs are expenditure outputs, given that the JRC activities are funded by a spending programme.

Market, Industry, Entrepreneurship and SME ": - Supply Of Raw Materials Critical To Strategic Eu Industries - Scientific Input Critical To Standardisation Across All Sectors	outputs	2016	
Outputs in the area of "Intellectual Property Rights": - Demonstrator for the fight against counterfeiting	Policy related outputs	Throughout 2016	2
Outputs in the area of "Customs policy and the fight against fraud": - European Harmonisation Of The Complete Denaturing Of Alcohol	Policy related outputs	Throughout 2016	23

General objective 9:
Europe as a Stronger Global Actor

32. Impact indicator: Sustainable Development Goal 1.1.1: Proportion of population below international poverty line
Source of the data: World Bank (poverty rate); UN Population Division (population weights)

Baseline (Computed on country level data from 2012 or before, drawing on World Bank data for the poverty rates, and UN Population Division data for the weights; extracted in November 2016 to take into account the revisions in the poverty line from $1.25 to $1.90.)	**Interim Milestone**	**Latest known value** (Computed on country level data from 2014 or before, drawing on World Bank data for the poverty rates, and UN Population Division data for the weights; extracted in November 2016)	**Target** (2030) UN Sustainable Development Goals
16.8% (including the graduated countries - Partnership countries for which bilateral assistance is phased out) 27.5% (excluding the graduated countries) For the calculation of the baseline beneficiary countries under the	Rolling On course for 2030 based on annual progress report prepared by UN Secretary General.	15.2 % (including the graduated countries - Partnership countries for which bilateral assistance is phased out) 27.0 %	0%

Development Cooperation Instrument and European Development Fund have been taken into account. Beneficiaries under the European Neighbourhood Instrument and EU-Greenland Partnership Instrument have been excluded.		(excluding the graduated countries)	

Completed evaluations: Internal evaluation PRIME 2016 completed
H2020 and Euratom interim evaluations to be performed in the first semester 2017

Specific objectives 9.1 to 9.3 (contributing to H2020 Specific Objective 17 and to EURATOM Research & Training Programme Specific Objectives 9, 10, 11, 12 and 13):
A well-informed European policy-making, appropriately and timely supported by the JRC through the provision of high quality and innovative scientific and technical studies, tools, data, materials, models and standards, in the following areas:
(Specific objective 9.1) Global Safety and Security
(Specific objective 9.2) International Cooperation and Development
(Specific objective 9.3) Associated and Neighbourhood Countries

Related to spending programmes:
H2020 and Euratom

Result indicator 1: Proportion of achieved planned policy deliverables - Number of planned policy deliverables achieved[22] in year N / total number of policy deliverables planned for year N
Source of data: JRC internal indicator (based on Pubsy/JPB data)

Baseline (2015)	**Interim Milestone**	**Target**	Latest known results (situation on 31/12/2016)
72%	>72%	>72%	96%

Result indicator 2: Weighted average of overall customer satisfaction
Source of data: JRC internal indicator (based on Pubsy data)

Baseline 2016	**Interim Milestone**	**Target**	Latest known results (situation on 31/12/2016)
phased-in in 2016 for testing	N/A	N/A	N/A To be launched in April 2017

Completed evaluations: Internal evaluation PRIME 2016 completed
H2020 and Euratom interim evaluations to be performed in the first semester 2017

Main outputs in 2016:

[22] A planned deliverable is considered "achieved" when it has at least one linked output registered in Pubsy or in the Pubsy workflow.

Policy–related outputs /expenditure outputs[23]			
Description (detailed description in Annex 15 below)	Indicator	Target date	Latest known results (situation on 31/12/2016)
Outputs in the area of "Global Safety and Security ": - JRC Tools Support EU Commitments To Address Humanitarian Crises - Launch Of The Multi-Temporal Global Human Settlement Database - Support To Strengthening Technical Capacities In Nuclear Security At European And International Levels	Policy related outputs	Throughout 2016	118
Outputs in the area of "International Cooperation and Development": - JRC And International Partners Join Forces To Assess Food Insecurity - From Food Security To Energy Security In Sub-Saharan Africa	Policy related outputs	Throughout 2016	39
Outputs in the area of "Associated and Neighbourhood Countries": - Air Quality in the Danube macro-region: Towards a coordinated science-based approach in support of policy development - Modelling vector-borne infectious disease dynamics under climate change	Policy related outputs	Throughout 2016	5

General objective 1: A New Boost for Jobs, Growth and Investment General objective 3: A Resilient Energy Union with a Forward-Looking Climate Change Policy General objective 4: A Deeper and Fairer Internal Market with a Strengthened Industrial Base General objective 9: Europe as a Stronger Global Actor	
Specific objective 10: In order to ensure the most relevant and	Related to

[23] For the JRC, the distinction policy-related outputs and expenditure outputs is not relevant as all policy-related outputs are expenditure outputs, given that the JRC activities are funded by a spending programme.

timely scientific support to the European policy-making, the JRC will effectively and efficiently coordinate its activities related to the management of the JRC WP cycle, of the relations with policy DGs and other policy and scientific stakeholders and knowledge management. Note: this specific objective refers to the policy support coordination activities covering all areas of work of the JRC (ie. all CGOs, as explained in the "Strategy" chapter of the Strategic Plan)	spending programmes: H2020 and Euratom

Result indicator: Not applicable, given the diversity of activities. Indicators are available on output level, in the MP 2016.

Baseline	Interim Milestone	Target
N/A	N/A	N/A

Completed evaluations: Internal evaluation PRIME 2016 completed
H2020 and Euratom interim evaluations to be performed in the first semester 2017

Main outputs in 2016:

Policy–related outputs /expenditure outputs[24]

Description	Indicator	Target date	Latest known results (situation on 31/12/2016)
1) Work Programme management	1a. Planning: Adopted Work Programme 2017-18;- Periodic update of 2016 WP 1b. Evaluation: Performance and Impact Review (PRIME), ex-ante assessment 1c. Implementation of the WP cycle review (1st & 2nd phase), including IT support	Throughout 2016 - Q1/Q2 - Throughout 2016	• WP2017-2018; ISC launched in November, finalisation procedure (written procedure) launched • Ex-ante (WP2015) and ex-post (WP2017-2018) evaluations carried out • WP 2016 updated throughout the year 1c. To maintain JPB operational status. - System adaptation for WP planning 2017 - Development to include HR and Budget planning (operational in 2016) - Start of development to manage HR and Budget ceilings / checks in WP planning - Development of basic WP deliverable monitoring module (due to be operational 2Q 2017)
2) Science Policy	- Successful DG bilateral	-	• 8 Director-General

[24] For the JRC, the distinction policy-related outputs and expenditure outputs is not relevant as all policy-related outputs are expenditure outputs, given that the JRC activities are funded by a spending programme.

interface	meetings - Updated MoU to reflect WP - Strengthened JRC role in better regulation initiatives - Monitoring of policy developments in the DGs - Participation in relevant initiatives , e.g. Task Forces, (Impact Assessment) Steering Groups, Inter-Service Groups - High quality input into inter-service consultations; high quality briefings, concept notes, policy briefs;- key contributions to the training on EU decision making - Key contributions to main JRC policy events e.g. related to social aspects of EMU, & human capital in territorial development - Key contributions to the summer school 2017	Throughout the year - Q2 & Q4 - Q3	level meetings with DGs organised • 2 new MoU • Several notes prepared and meetings organised with SecGen and the RSB to discuss a strengthened role for JRC in better regulation initiatives • Coordination of JRC input into all ISC and participation in ISG • Briefings – CdF for 36 briefings, contributions to 13 riefings • Contributions to several concept notes, policy briefs and communication material – eg on SDGs, vehicle emissions, … • Contributions to corporate reports and events – eg on collaborative economy, fairness, European Development Days, COP 22 • Contribution to the organisation of the summer school 2017 & the training on EU decision making
3) Impact assessment Rolling review of JRC's contributions to impact assessments with a view to strengthening the JRC's role in future IAs.	Rolling inventory of JRC's contribution for impact assessments in the fields of Sustainability, Resource Efficiency and Agriculture for 2016	- Throughout the year	• As part of JRC's effort to strengthen its role in better regulation, an inventory of JRC's contribution in Impact assessments, REFITs and evaluations was prepared and put on connected
4) Modelling - Contribute to making MIDAS a Commission-wide inventory of models	Regular reviews of functionalities and contents of MIDAS in the first phase of implementation as a COM-wide inventory	Q4	The Commission-wide modelling inventory and knowledge management system – MIDAS – is being developed by JRC under the guidance of the Inter-Service Group on Modelling Inventory (ISG-MI). The ISG-MI is the governance body of MIDAS in which 23 DGs and Commission services are represented. In February 2016 requirements from the ISG-MI were collected. These

			were incorporated in a prototype on which members of the ISG-MI provided feedback. In November 2016 the first version of the Corporate modelling inventory was presented to the ISG-MI. The SG expressed appreciation for JRC's work on MIDAS, and underlined that it is an important corporate tool to use, reuse and document models in a proper way, leading to the propagation of sound methodology underpinning the Commission's Better Regulation policy and potentially to significant savings in terms of financial and personnel outlays.
5) Coordination of international, inter-institutional and stakeholder relations 5a. Inter - institutional relations Flagship event - Science meets Parliaments • Reinforced inter-institutional engagement with the EP and the Committee of Regions (COR), as well as the EU Presidencies (Slovakia) • The JRC flagship initiatives Science meets Parliaments/Regions broadened the scope of engagement with the EP and national parliaments, as well as with the COR, enjoying international recognition.	5a. 1.Total no. of briefings for visits of MEPs to JRC 2. Total No. of EP questions handled 3. Total No. of petitions handled 5b. 1. Total No. of overarching collaboration arrangements, (MoU, BCA) signed in 2016: each for international and with MS 2. Total No. of steering committee meetings organised 3. Total No. of briefings for Commissioner, President, DG, EEAS 4. Total No. of bilateral meetings with Ministers/Sec of State organised 5c. 1. Weekly Briefings (till the end of the year) 2. Development of conceptual approaches on JRC 2030 Strategy priorities	Q1-Q4 Q1-Q4 Q1-Q4	5a. 1. 10 2. 53 3. 2 5b. 1. International 7 MS: 11 2. 1 3. 102 4. 19 5c. 1. 40

5b. Stakeholders and partnerships Cooperation with key partner countries and international organisations: Management of JRC's External agreements: Develop structured collaboration (non-nuclear area) with key partner countries and international organisations 5c. JRC governance and outreach JRC Weekly Briefing and other regular products: Science and policy monthly newsletter	3. JRC Education and Training: A new Strategic Approach to the JRC Education and Training focusing was approved on 31 March 2016. A Steering Group was established as an internal consultative and advisory body to the Director General in order to support the implementation of the Strategic Approach across all the JRC. 4. Research infrastructures Definition of the approach on the opening up of JRC Research Infrastructures (RI)		
6) Coordination of the planning, reporting, monitoring and evaluation in the JRC 6a. Coordination of the Annual Activity Report Process 6b. Annual evaluation of the JRC Work Programme (JRC Productivity and Impact Review, PRIME) 6c. Coordination of ex-ante assessment for WP 2016-17 6d. Coordination of the Management Plan Process 6e. JRC indicator system (MP, AAR, TdeB).	6a. JRC Annual Activity Report 2015 6b. - JRC Productivity and Impact Review (PRIME) 2015 implemented - JRC Productivity and Impact Report 2015 including a mapping of JRC outputs and impacts 6c. Ex-ante assessment report 6d. JRC Management Plan 2017 6e. Up-to-date, consistent and relevant indicator system 6f. JRC Excellence Mapping Report 2016	Q1 Q1 / Q2 Q2-Q3 Q4 Throughout the year Q4	6a. to 6e. delivered on time 6f. postponed to 2017 in order to allow for a more meaningful time series (extended time lag with respect to previous excellence mapping)
7) Development and implementation of strategy, processes and infrastructure for JRC knowledge management and dissemination	7a. Further development of the competence mapping (introduction of info on scientists' publications quality and impact) 7b. Data policy:	3rd phase: Q4 Q2 Q2	7a. Completed development of proof of concept application allowing mapping of competences based on scientific publications. Started analysis for wider implementation of competence mapping.

	publication of data in the EU Data Portal 7c. Set-up of the operational structure of the ICT scientific governance 7d. Implementation of the output review mechanism in Pubsy 7e. JPB tool made available to the other EC services	Q2 Q4	7b. The Data Policy was published in April 2016 (EUR 27163 EN, 2015). DG CNECT quoted this policy as an excellent example of Commission putting in practice its directives and invited others to follow the example (Ares 263506, 19/01/2016). The JRC foresees to extend this action, to assist also other DGs in the field. The first JRC Data catalogue was uploaded on the EU Data Portal and on the JRC Science Hub as well in March 2016. 7c. The JRC has been re-organised and a new structure has been implemented on 01/07/2016. Under this new JRC structure, a specific ICT Architect Office has been set up in the Directorate A, Unit A1. A draft document "JRC ICT Strategy 2017-2020" has been issued, meant to cover the JRC ICT in its whole. This document is currently under revision. 7d. A completely electronic Quality Assurance workflow has been implemented in PUBSY. The activation depends on a decision by the JRC directors. 7e. Launch of the development of EKB (Environment Knowledge Browser) for DG ENV, DG RTD, DG CLIMA, ESTAT, EEA based on JPB technology. System is due to be operational 2Q 2017.
8) Technical and administrative coordination of the	8a. Agendas, briefings, concept papers 8b. Minutes of meetings,	Q2 and Q4 Q2 and Q4	The structure was reorganised and all the nuclear activities are gather

JRC Euratom Steering Committee (JESC). Monitoring and reporting of the implementation of JESC decisions and actions. 8a. Preparation of JESC 8b. Monitoring/reporting	follow-up actions, implementation report		under a single Directorate. The JESC didn't meet in 2016 and was replaced by regular coordination meetings between Dir G and the Euratom Coordination Unit
9) Mid-term evaluation of the Euratom Programme 2014-2018	- Report on the activities performed during the period	Q3	All the necessary reports and documents were prepared and delivered to the panel. Kick-off meeting took place in Karlsruhe (27/10/2016) and a review meeting of nuclear security activities held in Ispra (12/12/2016). In 2017 the work continues with review meetings in Geel and Petten and a final panel meeting.

General objective 1: A New Boost for Jobs, Growth and Investment

General objective 3: A Resilient Energy Union with a Forward-Looking Climate Change Policy

General objective 4: A Deeper and Fairer Internal Market with a Strengthened Industrial Base

General objective 9: Europe as a Stronger Global Actor

Specific objective 11: To ensure the highest quality of its policy support, the JRC will effectively and efficiently maintain scientific excellence in its core competences Note: this specific objective covers all areas of work of the JRC (ie. all CGOs, as explained in the "Strategy" chapter of the Strategic Plan)	Related to spending programmes: H2020 and Euratom

Result indicator 1: Proportion of peer-reviewed publications in the top 10% most cited journals – Number of peer-reviewed publications in the top 10% most cited journals listed in Scopus (SJR) / total number of peer-reviewed publications in journals listed in Scopus
Source of data: JRC internal indicator (based on Scopus/SciVal)

Baseline 2015	**Interim Milestone** 2018	**Target** 2020	Latest known results (situation on 31/12/2016)
36%	>36%[Error! Bookmark not defined.]	>36%[Error! Bookmark not defined.]	45%

Result indicator 2: Proportion of JRC scientific publications published in peer-reviewed journals and proceedings – Number of peer-reviewed publications / total number of scientific publications (ie. Pubsy category 2.x "Scientific output") **Source of data:** JRC internal indicator (based on Pubsy data)			
Baseline (2015)	**Interim Milestone** 2018	**Target** 2020	Latest known results (situation on 31/12/2016)
65%	>65%[9]	>65%**Error! Bookmark not defined.**	70%
Result indicator 3: Proportion of peer-reviewed publications co-authored with non-JRC authors – Number of peer-reviewed publications co-authored with non-JRC authors/total number of peer-reviewed publications **Source of data:** JRC internal indicator (based on Pubsy data)			
Baseline 2013	**Interim Milestone** 2017	**Target** 2020	Latest known results (situation on 31/12/2016)
73.5% 2015: 71.5%	72 ± 3%	72 ± 3%	72.3%
Result indicator 4: International collaborations – Number of peer-reviewed publications co-authored with organisations from countries outside ERA/total number of peer-reviewed publications **Source of data:** JRC internal indicator (based on Pubsy data)			
Baseline 2013	**Interim Milestone** 2017	**Target** 2020	Latest known results (situation on 31/12/2016)
24% 2015: 24.3%	24±3%	24±3%	20.5%
Completed evaluations: Internal evaluation PRIME 2016 completed H2020 and Euratom interim evaluations to be performed in the first semester 2017			

Main outputs in 2016:			
Policy–related outputs /expenditure outputs[25]			
Description	Indicator	Target date	Latest known results
Publication of scientific results in peer reviewed journals.	1. Peer-reviewed publications listed in SCI-e and SSCI	Throughout 2016 Target value: >680	689

[25] For the JRC, the distinction policy-related outputs and expenditure outputs is not relevant as all policy-related outputs are expenditure outputs, given that the JRC activities are funded by a spending programme.

ANNEX 13: Indicators and outputs related to decommissioning

Objective:
Implement the Decommissioning & Waste Management Programme (see progress indicators)

Brief description:

The decommissioning activity aims to progressively dismantle the JRC's nuclear installations, either already obsolete (with no foreseen further use) or "future liabilities" (still in use). It also intends to treat "historical" waste (i.e. waste accumulated in the past) and waste arising from the dismantling operations. In 1999, the Commission decided to launch a programme to meet this objective. By this choice, the Commission shifted to the practice adopted by most EU Member States, preferring to start the decommissioning immediately after shutdown of the installations rather than deferring decommissioning in the hope that decreasing radiological activity would reduce the financial burden. The programme started in 1999 and is based on the assumption, made for budgetary planning reasons, that the decommissioning of the last nuclear installation and the final disposal of historical wastes will be achieved around 2032 at the Ispra site.

Due to the status of their facilities and to their respective environment, the Ispra site (IT) is engaged in a wider range of activities than the three other sites Geel (BE), Karlsruhe (DE) and Petten (NL), where most facilities are still operational. However, other sites, e.g. Karlsruhe, will begin in the near-medium term significant campaigns to dismantle obsolete facilities.

Main outputs in 2016

Description	**Latest known result**	**Intermediate target** **(end of 2016)**	**Final target**
1) Decommissioning and waste management activities at Ispra - Management of Nuclear Material and High Level Waste (HLW) up to its Intermediate Storage	Call for tender on hold, reprocessing as alternative option is under investigation Feasibility study	Result of feasibility study for possible reprocessing available	Evacuation of HLW ready (2022)

	contract for reprocessing signed		GF in operation (beginning 2019)
- Construction of waste treatment facility (grouting facility, GF)	Implementation of Alternative options after turnkey contract resolution Demolition of old cementation plant completed Major civil works call for tender published for seismic upgrade of building 41 C	Major civil works completed (building 41 C seismic upgrade)	FWP 1st production batch ready for use (in 2019)
- Qualification and supply of final waste package (FWP) containers	FWP qualification tests completed, final approval pending comfort letter from Sogin Procurement of IP2 containers delayed, Approval of "Piano Operativo delayed by I.S.P.R.A. waiting letter of comfort by Sogin	Procurement of IP2 containers for FWP launched	Perform 1st three campaigns on historical waste by 2022, supercompact all waste for conditioning Fuel remnants transferred to ESSOR hot cells (in 2018 after TSA commissioning) TSA formally in operation (in 2018)
- Radioactive waste characterisation and super-compaction	Fuel remnants & activated material packaged	File ("Piano Operativo") for characterisation and super-	"Cleared" waste evacuated and project

		compaction approved by Safety Authorities;	closed (2017)
- Evacuation of high level waste from "LCSR" facility (fuel remnants and activated material)	- Internal Emergency plan had been approved,		STRRL facility (Phase 1/2 excl. Tank Farm) 100% decommissioned (Ph .1 by 2020, Ph.2 by 2023)
	- Waiting for approval of external emergency plan	No activity waiting for TSA commissioning	
- Temporary storage area for nuclear materials (TSA)	- Waiting for TSA commissioning		
	FARO facility dismantling 100% completed	Nuclear tests of the TSA authorised and performed	
	"Clearance" of waste procedures under elaboration and review with Safety Authorities		
- Decommissioning of obsolete "FARO" nuclear facility and management of associated waste	STRRL pre-decommissioning stopped at 36% pending approval of licence conversion by Ministry for Economic Development	Clearance" of waste issued from facility decommissioning completed at 100%	
- Decommissioning of obsolete "STRRL" nuclear facility (excluding the tank farm facility, TF)			

		Obtain STRRL license conversion;	
2) Pre-decommissioning - waste management activities Karlsruhe - Dismantling obsolete equipment (glove boxes) - Residual contribution to German waste repository (residual budget as updated by German Authorities in 2014)	70% (+ 5) glove boxes dismantled 37% of budget committed	72% (+ 8) glove boxes dismantled 42% of budget committed	100 % of legacy glove boxes dismantled (date not defined) 100 % of the budget committed (in 2023)
3) Pre-decommissioning and waste management activities at Geel - Evacuation of nuclear material - Dismantling/evacuation obsolete VDG equipment	Material under contract evacuated 8000 items identified - Conditioning, decontamination and preparation for respective waste streams	- Sorting, classification and conditioning of additional nuclear material identified for future evacuation	- 100 % materials evacuated - 100 % materials evacuated
4) Pre-decommissioning - waste management			

activities at Petten - transport and decontamination of steel waste for recycling; recovery of concentrated radioactive slag and transport of excessively activated steel samples and slag to COVRA storage facility - optimization study, transport and disposal of JRC legacy waste (un-irradiated experimental fuel) to COVRA - preparation of strategy for HFR decommissioning - Update of HFR decommissioning cost estimation (legal requirement, every 5 years) and decommissioning plan	steel samples transferred to interim storage at NRG for combination with similar waste (cost savings); timing dependent on NRG; Draft of roadmap submitted - latest report from 2012, contract signed in 2016	- transports performed - finalisation of feasibility study for combined transport (with ECN, NRG) -preparation of roadmap for development of strategy (1st Q) - contract will be signed early 2016	- steel decontaminated and recycled; - activated steel and slag sent to COVRA - all material evacuated - clarity about options for JRC to best prepare for HFR decommissioning - result available end of 2017

ANNEX 14: JRC core indicators

JRC Core Indicators/selected SP 2016-2020 and MP 2016 indicators						
Management information need	**Indicators**	**Definition**	Value 2015	**Value 2016**	**2016 Target*** (unless otherwise specified) * target based on past performance, unless otherwise specified	**Comments**
Perspective 1: Outputs & impact						
Impact of policy support						
SP General Objectives SPP Key performance indicator 1	**Policy support impact**	**Number of occurrences of tangible specific impacts on European policies resulting from technical and scientific policy support provided by the JRC**	372 (PRIME 2015)	438 (PRIME 2016)	**387 (PRIME 2016)**	453 (PRIME 2020)
Scientific productivity						
SP Specific Objective 11 SPP Key performance indicator 2	**Proportion of peer-reviewed publications in the top 10% most cited journals**	**Number of peer-reviewed publications in the top 10% most cited journals listed in Scopus (SJR) / total number of peer-reviewed publications in journals listed in Scopus**	36%	**45%**	**>36%**	
SP Specific objective 11	**Proportion of JRC scientific publications published in peer-reviewed journals and proceedings**	**Proportion of JRC scientific publications published in peer-reviewed journals and proceedings / total number of "scientific outputs" (Pubsy categories 2.x)**	65%	**70%**	**>65%**	
MP Specific objective 11	**Peer-reviewed publications listed in SCI-e and SSCI**	**Number of peer-reviewed publications listed in SCI-e and SSCI**	699	**689**	**>680**	
Achievement of policy related objectives and deliverables						
SP: Specific objectives 1.1 to 1.9 Specific objectives 3.1 to 3.3 Specific objectives 4.1 to 4.3 Specific objectives 9.1 to 9.3	**Proportion of achieved planned policy deliverables**	**Number of planned policy deliverables achieved in year N / total number of policy deliverables planned for year N**	N/A (new indicator)	**96%**	**>82%**	
Customer satisfaction						
SP: Specific objectives 1.1 to 1.9 Specific objectives 3.1 to 3.3 Specific objectives 4.1 to 4.3 Specific objectives 9.1 to 9.3 SPP Key performance indicator 4	**Weighted average of overall customer satisfaction**	**Weighted average of overall customer satisfaction**	N/A (new indicator)	N/A	**N/A (new indicator)**	The phasing-in of the new customer satisfaction process has been advanced to 2017. Its launch is imminent (April 2017).
Scientific collaboration and networking						
SP Specific objective 11	**Peer-reviewed publications co-authored with non-JRC authors**	**Number of peer-reviewed publications co-authored with non-JRC authors/total number of peer-reviewed publications (% of peer-reviewed publications listed in SCI-e and SSCI)**	72%	**72.3%**	**72 ± 3%**	
SP Specific objective 11 SPP Key performance indicator 3	**International collaborations**	**Number of peer-reviewed publications co-authored with organisations from countries outside ERA/total number of peer-reviewed publications (% of peer-reviewed publications listed in SCI-e and SSCI)**	24%	**20.5%**	**24±3%**	
Policy support productivity						
MP: Specific objectives 1.1 to 1.9 Specific objectives 3.1 to 3.3 Specific objectives 4.1 to 4.3 Specific objectives 9.1 to 9.3	**Policy related outputs**	**Number of policy related outputs**	1613	**1563**	**1692**	The target value for policy related outputs is based on the content of the Multi-annual Work programme of the JRC currently available in JPB. The content is subject to change due to changes in Commission requierements throughout the year.
Public visibility						
Part 2.E	**Articles in the media**	**Total number of articles in the media**	N/A (new indicator)	indicator suspended following the JRC reorganisation	**>2700**	
	Access to JRC websites	**Number of page views on the JRC website**	7.7 million	**6.7 million**	**> 7.7 million**	
		Number of visits to the JRC website	2.8 million	**2.7 million**	**> 2.8 million**	

Management information need	Indicators proposed	Definition	Value 2015	Value 2016	2016 Target* (unless otherwise specified) * target based on past performance, unless otherwise specified	Target related comments
Perspective 2: Organisational management						
Financial Management						
Part 2.B - Objective 1 (Indicator 5)	**Quality of procurement procedures submitted to the PPAG**	**Proportion of positive opinions of the Public Procurement Advisory Group (PPAG)**	95%	**96%**	**≥95%**	
Payments						
Part 2.B - Objective 2 (Indicator 4)	**Timeliness of payments**	**Proportion of payments done within legal time limits**	94%	**94%**	**≥95%** subject to full availability of payment credits	
Internal Control						
Part 2.B Objective 2 (Indicator 3) SPP Key performance indicator 5	**Implementation of Internal Control Standards in the JRC**	**Average of scores obtained from the annual survey on the implementation of Internal Control**	3.5	**3.4**	**3.5**	3.6 by 2020
Income from additional activities						
Part 2.B, Objective 2 (Indicator 5)	**Contractual income**	**Annual cashed income from activities outside Institutional budget (% of the Institutional budget, ie. budget for JRC (direct actions) under the Framework Programme for Research)**	19%	**24%**	**15%**	
Perspective 3: Working environment						
Equal opportunities						
SP Part 2.A (Indicator 1)	**Percentage of female representation in middle management**	**Number of women/(Number of women + men) in middle management positions**	16.4% In 2015, there were was one nomination of a female to senior mgmt level and 0% of women were nominated to middle mgmt positions. 32% of all newly recruited staff in AD-non mgmt positions were women.	**15%** In 2016, there were 2 nominations of females to senior mgmt level and 100% of women were nominated to middle mgmt positions. 44% of all newly recruited staff in AD-non mgmt positions were women	**≥19%** taking into account known vacant positions and expected retirements.	35% by 2019 for the JRC according to SEC(2015)336

ANNEX 15: Examples of policy support achievements and impacts

A new boost for jobs, growth and investment

Collective and coordinated efforts at the European level are needed to put Europe on the path to economic recovery. In 2016, the EC focused on addressing current market failures, mobilising private investments and ensuring that adequate skills for jobs are available to EU citizens. Sustainable development and the shift towards a circular economy were also prominent in 2016.

In this context, the JRC continued to contribute to boosting jobs, growth and investment by means of a number of initiatives in its different areas of expertise. A new Knowledge Centre for Territorial Policies was launched and Smart Specialisation Platforms (S3P) were developed to help EU regions perform better. JRC's economic studies, modelling tools and screening methodologies contributed to identifying key challenges and opportunities and informing policy in a very diverse set of sectors such as agriculture, trade, employment and health. The launch of competence frameworks contributed to streamlining EU citizens' skills and competences.

Smart specialisation platforms support regional cooperation and investment

In 2016, the JRC and others developed Smart Specialisation Platforms (S3P) to support regional cooperation and investment in the areas of industrial modernisation and agri-food. The thematic platform on Energy, launched in May 2015 underwent considerable impulse in 2016.

Within the Energy Platform, key priorities include energy efficiency, smart grids, e-mobility and wind energy technologies. Using illustrative maps to identify possible synergies, a JRC report grouped regions and countries with common technology interests based on the European Strategic Energy Technology Plan (SET-Plan). The JRC-developed EYE@RIS3 online tool was used to analyse the information provided by each region and identify activities in which an investment in resources was likely to stimulate knowledge-driven growth.

The Industrial Modernisation Platform and the Agri-Food Platform were launched at the SMART REGIONS conference in June 2016.

The Industrial Modernisation Platform held its kick-off meeting in November. It offers hands-on support to regions to foster inter-regional cooperation by matching up smart specialisation priorities – such as Key Enabling Technologies, service innovation and resource efficiency. The platform helps regions to develop or share infrastructure such as testing facilities, pilot plants, data centres and fab labs.

The Agri-Food Platform held its first meeting in December, which notably resulted in agreed working arrangements to prepare partnerships in thematic areas and establish a project-investment pipeline. The platform aims to contribute to a more competitive and sustainable EU food supply chain, and to more effective targeting of EU regional funds towards growth and jobs, especially through the numerous SMEs and micro-companies that make up this chain.

RIO country reports identify key research and innovation (R&I) challenges

The JRC's 2015 series of Research and Innovation Observatory (RIO) country reports was published in 2016 and identified industry collaboration and the commercialisation of public research results as two of the major research and innovation challenges facing many EU countries. The reports also showed that Europe suffers from relatively low business innovativeness, especially from SMEs.

The reports analyse and assess national R&I system developments in relation to national policy priorities and the EU policy agenda, with a special focus on the European Research Area (ERA) and Innovation Union. The reports also feed into the European Semester activities.

The reports can be accessed through the Research and Innovation Observatory-Horizon 2020 Policy Support Facility website, which was jointly developed by the JRC and the Directorate-General for Research and Innovation as a key source of analysis, insights, statistical data and best practices for policymakers and stakeholders on designing, implementing and evaluating R&I policy.

JRC launches Knowledge Centre for Territorial Policies

In October, the JRC launched the Knowledge Centre for Territorial Policies – a single information access point for EU, national and international policymakers to help boost economic growth and job creation in cities and regions. It brings together a wealth of existing data, methods and tools to support regional and urban policy in areas such as demography, air quality and transport.

Within this knowledge centre, the Urban Data Platform is being developed as a joint initiative of the JRC and the Directorate-General for Regional and Urban Policy to inform on the status of and trends in European cities and regions, and to help analyse thematic fields such as economic development, demography, social issues and urban development.

These initiatives echo the importance of the territorial dimension, as embedded in the European Structural and Investments Funds, and the growth and job-creation opportunities stemming from the efficient and coordinated use of common assets across territories.

Competence frameworks to improve education and learning

In line with the Commission's new Skills Agenda for Europe, the JRC has developed several competence frameworks to improve and streamline skills and competences, such as critical thinking, entrepreneurship and problem solving.

The Entrepreneurship Competence Framework (EntreComp) proposes a shared definition of entrepreneurship as a competence and offers a reference point for any initiative developing curricula and learning activities that foster entrepreneurship.

The Digital Competence Framework for Citizens (DigComp) promotes confident, critical and creative use of information and communication technologies (ICT) to achieve personal and professional goals. Thirteen EU Member States are already implementing this framework and adjusting it to their specific contexts and purposes.

The European Framework for Digitally Competent Educational Organisations (DigCompOrg) helps primary and secondary schools as well as vocational education and training centres to self-assess the integration and use of ICT in the learning process.

All these frameworks rely on strong collaboration between academics, educational experts and policymakers across the EU, jointly facilitated by the JRC and the Directorates-General for Employment, Social Affairs and Inclusion and Education and Culture.

Collaborative economy: a research agenda for policy support

Although still relatively small, the collaborative economy is rapidly growing across Europe and is creating new services and jobs opportunities for EU consumers and entrepreneurs, and new growth potential for the EU as a whole.

In June, as part of the Digital Single Market strategy, the Commission issued its European agenda for the collaborative economy providing guidance and policy recommendations on balancing the need to develop innovative services with an adequate level of protection for consumers and workers. The JRC contributed to this work with a report on The Future of Work in the 'Sharing Economy' focusing on different aspects of digital labour markets, their function, their economic and social effects, and the legal disputes and regulatory issues they raise.

In its conclusions on the information gaps and opportunities in this field, the report suggested a research agenda that would provide a first set of policy-relevant findings to inform a wider and longer-term research programme in support of an evidence-based EU policy on the collaborative economy.

Key enabling technologies for growth and jobs

Key enabling technologies (KETs), such as nano-electronics or industrial biotechnologies, may play an important role in meeting the EC's priorities on growth and jobs. A first-time analysis by the JRC looked into how KETs and fast-growing technologies (FGTs) affect regional innovation and economic growth in the context of smart specialisation.

The study estimated the effects of FGTs and KETs on innovation (patents) and economic growth (GDP per capita), and showed that regional specialisation in KETs directly affects economic growth, while specialisation in FGTs only affects it indirectly, through its impact on the innovation performance of regions.

These, and other findings in the report, were discussed at the European Innovation Ecosystems: Good Governance and Effective Support for Smart Specialisation conference co-organised by the Committee of the Regions and the EC. The JRC and the European Association of Research and Technology Organisations (EARTO) held a session on how research and technology enable productivity and competitiveness, and stimulate regional innovation, differentiation and development.

Attracting R&D investment from multinationals

Attracting foreign investment to Europe from knowledge-intensive multinationals will help push forward the technological frontier, boost European productivity, and sustain economic growth and job creation, according to a study by the JRC.

In that study, the JRC and the Directorate-General for Economic and Financial Affairs analysed how regulation and red tape affect the world's top 2500 corporate R&D investors, based on the 2014 EU Industrial R&D Investment Scoreboard. The Scoreboard is the JRC's benchmarking tool for comparisons between companies, sectors and geographical areas, as well as for monitoring and analysing emerging investment trends and patterns.

The study found that reforming product market regulation and employment protection legislation could help certain countries become more appealing for investment. These results also feed into the country-specific recommendations under the Europe 2020 strategy, which aims to guide EU Member States on jobs, growth and investment, and the Investment Plan for Europe.

Scoreboard shows that R&D investment in EU is growing faster than global and US trends

With EUR 188.3 billion invested in the fiscal year 2015/2016, EU companies increased their R&D spending by 7.5 % year-on-year, ahead of the global (6.6 %) and US (5.9 %) trends. The 2016 EU Industrial R&D Investment Scoreboard, published in December by the JRC and the Directorate-General for Research and Innovation, also showed that 30 EU companies are among the world's top 100 R&D investors, mainly in the fields of

automotive, pharmaceuticals and biotechnology, ICT, and aerospace and defence.

Nonetheless, Asian companies showed the highest increases in R&D, especially those based in China (up by 24.7 % to EUR 49.8 billion), although their sales also fell. Globally, the software sector showed the highest year-on-year growth in R&D, at 12.3 %, followed by pharma (9.8 %), IT hardware (7.6 %) and automobiles (6.7 %).

The EU Industrial R&D Investment Scoreboard was accompanied by a survey of the 1000 top R&D investors based in the EU, which showed that in the coming years R&D investments may fall in some traditional industrial sectors while growing in high-tech sectors, specifically in healthcare, pharmaceuticals and technology hardware.

Screening methodology helps to identify endocrine disruptors

Endocrine disruptors are chemicals that impact on the hormone system of animals and humans. In line with its commitment to ensuring the highest level of protection of both human health and the environment, the Commission aims to adopt state-of-the-art, legally binding scientific criteria to determine what an endocrine disruptor is.

Measures specifying the criteria to identify endocrine disruptors were drafted in June, accompanied by an impact assessment report. The JRC contributed to this impact assessment by developing a screening methodology for a study to estimate which chemicals would be identified as endocrine disruptors. The methodology was used to screen the available evidence on approximately 600 chemicals, covering active substances used in plant protection and biocide products, as well as a selection of substances falling under the REACH Regulation, the cosmetic products Regulation and the Water Framework Directive.

Science for policy report on delivering on EU Food Safety and Nutrition in 2050 - Future challenges and policy preparedness"

The foresight study 'Delivering on EU food safety and nutrition in 2050 - future challenges and policy preparedness' aims to aid policy makers in their assessment of the resilience of the current food policy and regulatory framework with a time horizon to 2050, contributing to ensuring that EU citizens continue to enjoy high standards of safe, nutritious and affordable food.

The study employed the methodology of scenario development. The scenarios were constructed based on different developments of specific drivers that can significantly impact and bring change to the food system; these are global trade, EU economic growth, agro-food chain structure, technology uptake, social cohesion, food values, climate change, depletion of natural resources and world population growth.

For each scenario, a number of food safety and nutrition challenges were identified and prioritised based on their importance and likelihood to occur. On this basis, scenario-specific policy options were developed as suggestions to policy-makers on how to address these challenges to ensure the resilience of the future EU food safety and nutrition regulatory framework. Research needs were also identified to complement the proposed policy options, as well as a set of food-chain related indicators that could inform in advance if the EU is headed towards one of the study's scenarios.

Agro-economic modelling tools inform a more sustainable agriculture policy

Supporting the transition towards more sustainable agricultural practices has been a central policy issue for more than a decade. The dynamic development of agricultural markets requires continuous monitoring and analysis, and modelling tools have become indispensable.

Working with the Directorate-General for Agriculture and Rural Development, the JRC,

together with academia and international organisations, developed agro-economic models to contribute to a number of initiatives.

The annual medium-term outlook for the major EU agricultural commodity markets and agricultural income uses such models to provide EU market projections for arable crops, sugar, biofuels, dairy and meat markets with a 10-year horizon. The latest, which was presented at the 2016 EU Agricultural Outlook Conference in Brussels in December, helps to identify and understand key market dynamics relevant to policy developments. It also came with an uncertainty analysis, mainly based on the AGLINK-COSIMO model. Furthermore, the models are used to quantify potential variations in results, and enable the environmental impact assessment of policies, using agri-environmental indicators such as greenhouse gases and ammonia emissions.

Two JRC agro-economic models were also used to review the impact of 'greening' – financial benefits for farmers who use farmland more sustainably and care for natural resources as part of their everyday work. The Individual Farm Model for Common Agricultural Policy Analysis (IFM-CAP model) helps to find the optimal land allocation among production activities on individual farms, taking into account resources (arable/grass land and feed) and policy constraints. The Common Agricultural Policy Regionalised Impact (CAPRI) model gauges the combined impact of all greening measures, including on the environment.

The CAPRI model was also used under the 'Economic Assessment of GHG mitigation policy options for EU agriculture' (EcAMPA) project. The analysis contributed to the impact assessment accompanying the Commission's proposal on the inclusion of greenhouse gas emissions and removals from land use, land use change and forestry in the 2030 climate and energy framework.

The JRC also uses economic modelling to assess the impact of potential trade agreements with partners. The global Modular Applied GeNeral Equilibrium Tool (MAGNET) model allows for the depiction of the bilateral trade flows between the EU and its trade partners. It can show which sectors and EU regions could either benefit or lose from a potential trade agreement, compared to a 'baseline' situation. In November, a report presented to EU agriculture ministers showed the potential effects on EU agriculture of twelve free-trade agreements (FTAs) under the current EU trade agenda. The report highlighted relatively balanced cumulated impacts in terms of trade, production and price for the EU agricultural sector. For EU dairy products and pigmeat, prospects look favourable. A number of other products would also benefit from trade opening, ranging from commodities such as cereals to more high value/processed products such as beverages. On the other hand, the study also shows the vulnerability of specific agricultural sectors such as beef, rice and (to a lesser extent) poultry and sugar.

First-ever Global Soil Biodiversity Atlas

In May 2016, the JRC and the Global Soil Biodiversity Initiative (GSBI) published the first-ever Global Soil Biodiversity Atlas that maps the soil biodiversity of the entire planet and provides a detailed analysis of both soil organisms and the threats to soil biodiversity.

European Atlas of Forest Tree Species launched

In March 2016, The JRC launched the first edition of its European Atlas of Forest Tree Species, which provides a wealth of information on the many tree species in our forests, including their climatic preferences and singularities and how threats such as climate change may affect them.

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European Framework for Digitally Competent Educational Organisations (DigCompOrg)	http://europa.eu/!Cf88Vf	https://ec.europa.eu/jrc/en/digcomporg
The Future of Work in the 'Sharing Economy' (JRC report)	http://europa.eu/!yB68YY	http://publications.jrc.ec.europa.eu/repository/bitstream/JRC101280/jrc101280.pdf
The Specialisation of EU Regions in Fast Growing and Key Enabling Technologies (JRC report)	http://europa.eu/!DK36MT	https://ec.europa.eu/jrc/en/publication/specialisation-eu-regions-fast-growing-and-key-enabling-technologies
Regulation, red tape and location choices of top R&D investors (JRC IPTS Working Papers)	http://europa.eu/!dv77Kw	https://ec.europa.eu/jrc/sites/jrcsh/files/JRC100807.pdf
2016 EU Industrial R&D Investment Scoreboard	http://europa.eu/!Cx38ku	http://iri.jrc.ec.europa.eu/scoreboard16.html
Screening methodology to identify potential endocrine disruptors (JRC report)	http://europa.eu/!pY76MW	http://publications.jrc.ec.europa.eu/repository/bitstream/JRC101950/jrc%20screening%20methodology%20for%20ed%20impact%20assessment%20%28online%2

		9.pdf
An economic assessment of GHG mitigation policy options for EU agriculture (EcAMPA 2)	http://europa.eu/!XQ98Qt	http://publications.jrc.ec.europa.eu/repository/bitstream/JRC101396/jrc101396_ecampa2_final_report.pdf
Global Soil Biodiversity Atlas	http://europa.eu/!Xn47CX	http://esdac.jrc.ec.europa.eu/content/global-soil-biodiversity-atlas
European Atlas of Forest Tree Species	http://europa.eu/!CJ34jT	http://forest.jrc.ec.europa.eu/european-atlas-of-forest-tree-species/

A resilient European Energy Union with a forward-looking climate change policy

Ensuring a secure, affordable and climate-friendly energy supply for Europe is the raison d'être of the Energy Union Strategy and an important investment in Europe's future prosperity. Throughout 2016, the European Commission (EC) continued to deliver on its climate and energy objectives with the adoption of three important packages: on energy security measures in February; on accelerating the transition to low-carbon emissions in July; and on managing the transition to a clean energy in December.

Energy and climate policies are ever-more intertwined and these packages also support the EU's commitments under the Paris Agreement (COP21). Naturally, in 2016 the JRC continued to increase its involvement in developing and implementing the EU's climate and energy policies. Beyond its contribution to legislative proposals, the JRC advised EU negotiators at the Marrakech summit (COP22) and presented its most recent work to inform related debates in the broader scientific and policy arenas. Examples of these activities are provided below.

Paris pledges insufficient to meet 2 C, according to the JRC experts

The COP21 Paris Agreement pledges would enable only half of the emission reduction necessary in 2030 to keep global warming below 2 °C in the long run. However, the goal can still be reached and remain compatible with continued global economic growth if additional mitigation policies are put in place. These are the conclusions from GECO 2016 – Global Energy and Climate Outlook: Road from Paris, a JRC report looking into the evolution of the world energy system and GHG emissions to 2050 under different energy and climate policy scenarios. JRC scientists analysed several low-emission development pathways, achievable either through the aggregate effects of national policies or through globally coordinated action, and illustrated some of the economic challenges and opportunities for specific energy markets, sectors and technologies. GECO 2016 also provided balances for energy and GHG emissions for a range of key countries and regions as well as a description of the policies under consideration.

Based on the most recent energy and economic data, the report provided a quantified foundation for international discussions and contributed to future global stocktaking exercises. GECO 2016 has been produced in close collaboration with the Directorate-General for Climate Action and is an updated version of the modelling work that supported the negotiations at the 2015 Paris Agreement (COP21).

Covenant of Mayors – a local approach to global warming

The JRC report Covenant of Mayors: Greenhouse Gas Emissions Achievements and Projections was presented at the COP22 summit in Marrakech in November. It revealed that the first 315 implementation reports from more than 6200 municipalities across the EU and beyond show an overall reduction in GHG emissions of 23 % compared to baseline levels. Thus, these municipalities display the encouraging trend of being on track to reach their ambitious goal of a 30 % reduction by 2020.

Urban energy consumption generates about three-quarters of global CO_2 emissions. In response to the challenge, in 2008, the EC launched the Covenant of Mayors (CoM) to support local authorities in the implementation of sustainable energy and climate policies. CoM signatories make voluntary mitigation commitments to reduce emissions from energy consumption in sectors they can influence as local authorities (essentially, housing, services and urban transport).

Building on the CoM, a new, more ambitious Covenant of Mayors for Climate and Energy was announced in October 2015, based on three pillars: mitigation (40 % CO_2 emission-reduction target by 2030); adaptation; and secure, sustainable and affordable energy. At

4 September 2016, the cut-off date of the JRC analysis, 6926 local authorities from 54 countries had joined the initiative, representing more than 213 million inhabitants.

Global CO2 emissions from fossil fuels and industrial processes stall

In 2015, global CO_2 emissions from fossil-fuel combustion and industrial processes stalled, confirming the slowing trend observed since 2012. This is a result of structural changes in the global economy, global energy efficiency improvements and the changing energy mix in key countries, concludes the latest report by the JRC and the PBL Netherlands Environmental Assessment Agency.

Global primary energy consumption increased by 1 %, which is well below the 10-year average of 1.9 %, even though fossil-fuel prices fell in 2015 in all regions.

In 2015, two-thirds of global CO_2 emissions from fossil fuels and industrial processes were generated in China (29 % of the global total), the United States (14 %), the European Union (EU-28) (10 %), India (7 %), the Russian Federation (5 %) and Japan (3.5 %). Globally, this is one percentage point down from 2014 and the lowest share since 2002. There was also a significant increase in renewable sources for power generation (15.2 %), notably from wind and solar energy, representing 6.7 % of global output.

In the EU, a slight increase in CO_2 emissions from fossil fuels and industrial processes (ca. 1.3 %), after four years of falling annual emissions growth, was explained by a 4.6 % increase in gas consumption and a 4 % increase in diesel consumption in transport. At the same time, CO_2 emissions from electricity generation fell by 0.6 %.

The report is an annual publication by the JRC and the PBL Netherlands Environmental Assessment Agency and is based on data from the Emissions Database for Global Atmospheric Research (EDGAR).

Independent greenhouse gas verification

In 2016, the Directorate-General for Internal Market, Industry, Entrepreneurship and SMEs established with the JRC a CO2 Monitoring Task Force, with the mandate to support the design and launch of a European greenhouse gas (GHG) verification programme under Copernicus, which will combine an integrated CO2 observation system with inverse modelling to monitor fossil CO2 emissions. The observation system integrates space-borne data from the European Space Agency (ESA) with in-situ measurements from the Integrated Carbon Observation System (ICOS) - European Research Infrastructure Consortium (ERIC). The JRC's inverse modelling connects emission inventories with the GHG concentration observations to provide an independent verification of emissions reported to the United Nations Framework Convention on Climate Change (UNFCCC).

In the context of this work, the JRC co-authored the Copernicus CO2 report, describing the greenhouse gas verification system. This report was cited by the New York Times (May 2016) and presented to the UNFCCC SBSTA meeting (Bonn, May 2016) and to the COP22 summit (Marrakech, November 2016).

Improving air quality in urban areas

Good air quality is still a challenge in Europe. In 2015, 16 of the 28 Member States failed to comply with the EU's air-quality limit values.

To help tackle this problem, JRC scientists developed and released in June 2016 a modelling tool that calculates how changes in emissions affect air quality. The SHERPA tool (Screening for High Emission Reduction Potential on Air) aims to support policymakers in selecting sound policies to improve air quality by helping them to find the maximum air-quality improvement potential from locally designed measures and to

identify priority sectors and pollutants to be addressed in order to improve air quality in a given area. In addition, SHERPA can be used to calculate neighbouring regions' contributions to local air quality.

SHERPA works with a predefined set of input data (including emission inventories) that cover the whole of Europe at high resolution. This allows for a straightforward testing methodology for new air-quality policies for any given area in Europe.

Helping to increase the share of biofuels in transport

In an effort to reduce CO_2 emissions, the EU aims to ensure that 10 % of the transport fuel used in every EU country comes from renewable sources such as biofuels by 2020. With a 7 % cap on the final consumption of biofuels produced from agricultural crops, algae has received more attention.

However, despite high expectations, a JRC report Biofuels from algae: technology options, energy balance and GHG emissions: Insights from a literature review showed that the cost of algal production and its conversion into biofuels remains high. Technologies are still being developed, while key resources for algal growth (such as nutrients, water and CO□) remain too onerous for the economically viable production of algal biofuels.

The review also presented technological advances and an impact assessment of algal production on energy and GHG emission balances. In its conclusions, it recommended further assessing the techno-economic challenges and environmental impacts before the full-scale deployment of this industry.

In parallel, JRC scientists developed and produced a new certified reference material (CRM) for the cold filter plugging point (CFPP) and cloud point (CP) temperatures of biodiesel to establish the lowest temperature at which biodiesel can be used. This knowledge is important for ensuring that fuel filters do not become blocked during cold periods.

Sustainable energy security

In February, the Commission presented its energy security package in support of the Energy Union strategy's first dimension on energy security, solidarity and trust among Member States. The package sets out a wide range of measures to strengthen the EU's resilience to disruptions in gas supplies, including a legislative proposal, a strategy for liquefied natural gas (LNG) and gas storage, as well as a strategy on heating and cooling.

Thanks to its continuous involvement in the EU Energy Security Strategy and the experience gained from reviewing national plans, carrying out risk assessments and being involved in stress tests, the JRC helped with a number of these initiatives.

The JRC was mandated by the Directorate-General for Energy to describe and evaluate scenarios fostering the full integration of the Baltic electricity system within the EU power and market framework. Towards this goal, the de-synchronisation implications of the Baltic electricity grids from the Russia/Belarus system needed to be carefully assessed. Generation cost and required power system investment scenarios were compared over the 2025 and 2030 horizons. The JRC modelled the Baltic power system based on data on current and projected topology, demand, and costs gathered from ENTSO-E and the region's TSOs. A consensus on the methodology's assumptions, parameters, and scenarios emerged through several rounds of discussion with stakeholders. The results were presented at a final Work Group meeting in December 2016, and will be the basis for the final decision to be taken by BEMIP (Baltic Energy Market Integration Platform) where all the involved MS are represented.

The JRC also contributed to the impact assessment that underpinned the Security of Gas Supply Regulation included in the package. A JRC report on the improvements in the EU gas transmission network between 2009 and 2014 presented different crisis scenarios that helped in assessing improvements in the performance of the EU transmission grid and thus contributed to the design of the new infrastructure standard, as well as risk-assessment templates, preventive action and emergency plans, and the characterisation of EU gas regions. The JRC also supported the Baltic States and Finland in developing a regional Risk Assessment for their gas system, the first of its kind in Europe. The study used an updated hydraulic model for the gas system of the region generated by the JRC.

Upcoming climate hazards will hit Europe's industry, transport and energy infrastructure hard

According to a new JRC study: Resilience of large investments and critical infrastructures in Europe to climate change, with extreme weather events becoming more common in Europe, the current design, construction, operation and maintenance standards of critical infrastructures, including energy, transport, industrial and social sector, should be adapted to protect them from climate-related hazards.

The study evaluated the impacts of extreme weather events, such as heat- and cold-waves, droughts, wild fires, inland and coastal flooding, as well as windstorms, on critical infrastructures for the whole of the EU as well as Switzerland, Norway and Iceland.

Potentially, damage from climate hazards could triple by the 2020s, multiply six-fold by mid-century, and surpass 10 times today's total of EUR 3.4 billion/year by the end of the 21st century. Projections indicate that economic losses will be highest in the industry, transport and energy sectors, as they may multiply economic damage to the infrastructures by 15.

The study also showed that countries in southern Europe are most likely to be affected throughout the 21st century and thus require substantial investment to protect them from climate hazards.

Enhancing nuclear safeguards efficiency and effectiveness by developing innovative methods and tools for the inspectorates DG ENER and IAEA

The JRC continues to provide enabling research, technology, instruments, technical services and training for nuclear safeguards including the verification of treaties and agreements, to inspection agencies, States and operators, as planed under the EURATOM treaty.

A new inspection system has been developed by JRC, a backpack-mounted device to provide real time location information and change monitoring inside nuclear facilities. The 3D laser stop-and-go scanning (that creates a baseline and verification of declared changes) and on-the-go scanning using the new backpack-mounted 3D laser (that confirms that no-changes have taken place) were applied in the first geological repository of spent nuclear fuel currently under construction in Finland. The technique has allowed EURATOM and IAEA inspectors to independently model the excavated areas, verify the operator's declarations and at the same time they provided inspectors with a precise underground orientation tool. A patent was granted in October 2016 and the system won an award winning Technology as it outperformed a mix of 27 teams from academia and industry, achieving the best overall result at the 2015 Microsoft-sponsored indoor localization competition in Seattle. Evaluation of Load cell Data Collected from Operator Systems at a Gas Centrifuge Enrichment Plant is a task carried out by JRC under the European Commission Support Program to the IAEA.The JRC has been developing the application "Inspector Studio GBII" to support the safeguards activities of both IAEA and DG ENER inspectorates at the Gas Centrifuge Enrichment Plant Georges Besse II in France. The support activities are performed as a joint support task "France-EC" The French operator provides plant data sets which are analysed and treated by JRC. The

modules specifically developed for the Physical Inventory Verification PIV activities have been now fully tested and validated during the 2015 and 2016 PIVs. They allow a fast retrieving of the load cell data of all the stations of all the plant modules and the automated evaluation with the operator declarations. The use of the application also drastically reduces the impact of the PIV activities on the operation of the plant. The application also now includes innovative modules of a great interest for the inspectorates as it would allow a drastic reduction of the time and manpower efforts dedicated to the enrichment measurements of the cylinders on the park. The application also integrates functionalities (direct link to station curves, zoom...) which greatly facilitates the work of the inspectors.

The JRC's On-Site Laboratories at La Hague (F) and Sellafield (UK) are operated by JRC analysts during 45 weeks per year by teams of 2-4 rotating staff for up to 315 weeks per year to perform nuclear material analyses (up to 900 samples per year) by chemical and physical methods. Besides the technical impact of developing the OSLs, the JRC makes a strong contribution to nuclear safeguards and facilitates the establishment of a detailed account of the nuclear materials operations of the reprocessing plants. The two commercial reprocessing plants of spent fuel from power reactors process around 2000 tonnes of nuclear material per year. Under the Euratom Treaty, the EC has the duty to assure that nuclear material is only used for declared purposes. Key to provide precise control of the large flows of nuclear material is the analysis of samples taken at various key measuring points independently of the facility operator.

Promoting education and training for nuclear decommissioning

With many nuclear installations reaching the end of their operational life, and a complete phase out of nuclear energy foreseen in some EU Member States, the important issue of nuclear decommissioning is coming to the fore.

In this context, the availability of qualified and experienced personnel to support nuclear decommissioning is probably one of the most critical matters to be addressed, and is one where a coordinated EU approach is most needed. As the opportunities in a decommissioning career have yet to become well known, the industry and organisations will face a significant shortage of competent personnel in this field.

To address this threatened shortage, a Memorandum of Understanding was signed in December between 14 partners with nuclear expertise to provide a new training and knowledge-sharing platform to prepare specialists for the dismantling of obsolete nuclear plants in Europe. At the initiative of the JRC, the European Learning Initiatives for Nuclear Decommissioning and Environmental Remediation (ELINDER) was launched with the objective of raising the interest of students and professionals and stimulating careers in this critical field of activity.

In the coming years, ELINDER will offer vocational and hands-on training modular courses on nuclear decommissioning in cooperation with European universities, research organisations and other partner organisations. The initiative, which complements, expands and reshapes existing activities, which include, e.g., a Summer School on Decommissioning held annually in Ispra, is yet another example of the JRC's long-standing experience in nuclear matters and of the relevance of its nuclear decommissioning and waste management programme.

Driving Europe's transition to a low-carbon economy

In July, the EC presented its Communication Energy Union and Climate Action: Driving Europe's transition to a low-carbon economy as a package of measures to accelerate the transition to a low-carbon economy by reducing GHG emissions by at least 40 % by 2030, compared to 1990 levels, in all sectors of the economy and respond to the commitments made by the European Union countries under the Paris Agreement on

climate change.

Within this package, the JRC contributed substantially to the legislative proposal on integrating land use and forestry into the EU 2030 Climate and Energy Framework and to the European Strategy for low-emission mobility.

On land use and forestry, together with other EC services and stakeholders the JRC developed a methodology for setting forest reference levels, which enable different national circumstances to be accommodated. Used for country-specific baselines, the new methodology helps to quantify the reductions in GHG emissions resulting from forest management.

This work was underpinned by two recent JRC reports:1)Land use, land-use change and forestry (LULUCF) contribution to the 2030 EU climate and energy policy,; 2) An economic assessment of GHG mitigation policy options for EU agriculture (EcAMPA 2), presenting the potential evolution of non-CO_2 GHG emissions from EU agriculture and several mitigation policy options.

As for the European Strategy for Low-Emission Mobility, the JRC contributed to the development of a set of scenarios for assessing the impact of different policies to tackle CO_2 emissions from road transport. The scenarios were simulated with the JRC's newly developed fleet impact model DIONE, to develop projections on the evolution of the vehicle mix, activity, energy consumption and emissions up to 2050. The JRC also contributed to the definition of the new post-2020 CO_2 targets and carried out an extensive study on the elements affecting the difference between vehicle CO_2 emissions and fuel consumption, measured during laboratory tests and under real driving conditions. JRC analyses have thus informed critical aspects of the impact assessment and staff working documents linked to the strategy.

New Commission online tool to measure car journey fuel costs and CO_2 emissions

In line with the European Strategy for Low-Emission Mobility and in support of the Commission's initiatives for the decarbonisation of transport in Europe, the JRC has developed a 'green driving tool' to help citizens estimate fuel consumption, CO_2 emissions and the costs for any given car journey.

EU leaders in solar energy capacity, but there are fewer new installations

In 2015, the EU reached a cumulative installed capacity of 95.4 gigawatts (GW), meeting nearly 4 % of its final electricity demand. Although the EU is still a global leader in photovoltaic (PV) installations with 40.6 % (end 2015) of the global total of 235 GW of solar PV electricity generation, its share has dropped from a record of 66 % in 2012 and is continuing to decline, in relation to both global market growth and the absolute number of new installations. According to the JRC's PV status report 2016, this is due to changes in EU Member State support schemes and reduced investments.

Published annually by the JRC, the report combines up-to-date international information on the PV sector from public and commercial studies, cross-checked with its own research. From a cumulative capacity perspective, the report shows that Germany remained the EU leader in 2015 with nearly 40 GW, followed by Italy (nearly 18.9 GW), France (nearly 6.6 GW), the UK (8.9 GW) and Spain (5.4 GW).

About two-thirds of the new capacity in 2015 was installed in Asia, with China topping the ranking (16 to 18 GW), followed by Japan with 11GW, while the US connected 7.3 GW to the grid.

At the end of 2016, worldwide solar PV power was expected to exceed 310 GW, a capacity roughly equivalent to 1.5 % of global electricity demand.

Photovoltaics is an important asset in reaching the EU's climate and energy goals of reducing GHG emissions by at least 40 % by 2030 compared to 1990 levels, and achieving at least a 27 % share of renewables in the EU's energy mix in 2030.

Clean energy for all Europeans

Last in the series of energy packages planned for 2016, is the Commission's "Clean Energy for All Europeans" proposals to keep the EU competitive as the clean energy transition changes global energy markets. It pursues three specific goals: putting energy efficiency first, achieving global leadership in renewable energies, and providing a fair deal for consumers.

The JRC contributed with its expertise to help prepare the legislative proposals on energy efficiency, electricity market and risk-preparedness rules, as well as on the promotion of renewables and bioenergy sustainability policy.

The JRC also supported the EC's reviews of the Energy Efficiency Directive (EED) and the European Performance of Buildings Directive (EPBD) to bring them up to speed with the 2030 energy and climate goals and to facilitate their implementation at national level. These initiatives are critical considering that buildings account for 40 % of Europe's energy consumption and 36 % of CO_2 emissions in the EU, and while two-thirds were built before energy performance standards existed, only 1 % is renovated each year.

The JRC provided intelligence on energy-feedback systems, demand-response status, and building renovation strategies. It also contributed to setting up the EU Building Stock Observatory, and to guidelines on assessing the energy efficiency potential in the heating and cooling sector.

According to the JRC report Securing Energy Efficiency to Secure the Energy Union, meeting energy efficiency is under way. Despite Europe's progress in reducing energy consumption and improving energy efficiency, it is likely to miss the intermediary 2020 target of 20 % of energy saved, according to the JRC's Energy Consumption and Energy Efficiency Trends in the EU-28 (2000-2014).

As for the Renewable Energy Directive (recast) that sets out clear sustainability criteria for bioenergy, the JRC contributed to the assessment of costs, benefits and impacts related with biofuels, which have to be taken into account to ensure a well-balanced policy.

The JRC launched the interactive and collaborative online European Energy Efficiency Platform (E3P) to call upon the energy efficiency community to contribute to the collective effort of strengthening the knowledge base in this field of crucial importance.

The JRC also contributed to the Accelerating Clean-Energy Innovation Communication with the findings produced by the Strategic Energy Technologies Information System (SETIS) and its inputs to the 2016 State of the Energy Union report.

Market design is the 'rule book' for energy market players. Today's European electricity market is different since new climate and energy policies have changed the power sector. A recent JRC report analysed existing generation adequacy assessments produced by Member States and the European Network of Transmission System Operators (ENTSO-E) identified strengths and weaknesses, highlighted best practices, and made methodological recommendations.

Furthermore, the JRC supported the drafting of the Proposal for a Regulation on risk-preparedness in the electricity sector, which seeks common rules to be respected when preparing for and managing crisis situations that put the electricity supply at risk.

The second edition of the Report on energy prices and costs in Europe – due every two

years under the Energy Union Roadmap – was also part of the package and included findings from the JRC study on Production costs from energy-intensive industries in the EU and third countries.

LULUCF is included in the EU 2030 climate targets

As part of its 2030 Climate and Energy Framework, the EU will reduce the total greenhouse gas (GHG) emissions by 40% in 2030 as compared to 1990.

In July 2016, the Commission put forward a legislative proposal (COM/2016/0479) to include the Land Use, Land Use Change and Forestry (LULUCF) sector in this EU climate target.

The JRC has been instrumental in the design of this proposal. Specifically, the JRC developed and defended the approach to assess the climate mitigation by existing managed forests, which quickly became the most debated technical aspect of the whole legislative proposal. This approach quantifies the forest mitigation through a "forest reference level", i.e. is a projected country baseline for future forest GHG emissions and removals, against which the actual emissions and removals will be compared for accounting purposes. The reference level proposed by the JRC, and included in the legislative proposal, is based on the continuation of current forest management, taking into account the dynamic impact of forest aging: when a forest is getting older, the extra harvest (and the associated emissions) that may be temporarily needed to continue the current management will be embedded in the reference level, and thus will not be counted toward the target. At the same time, countries will not be allowed to exclude from the accounting an increase of emissions due to changes in management (e.g. extra harvest due to a high bioenergy demand).

The advantage of the JRC's approach on assessing forest mitigation is that it ensures transparency, fairness (countries are not penalized because their forest are getting older) and the environmental credibility of forest accounting (especially in relation to bioenergy, which is a key aspect of the whole EU climate target). At the same time, this approach acknowledges the various forest national circumstances. This proposal received great attention from the Member States and the European Parliament.

Furthermore, the JRC provided a significant contribution to the impact assessment associated to the legislative proposal, by carrying out a number of ad-hoc analyses and providing country-level forest projections and country factsheets.

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Covenant of Mayors: GHG Emissions Achievements and Projections	http://europa.eu/!Cy69ft	https://ec.europa.eu/jrc/en/publication/eur-scientific-and-technical-research-reports/covenant-mayors-greenhouse-gas-emissions-

		achievements-and-projections
Trends in Global CO^2 Emissions – 2016 Report	http://europa.eu/!Qf88JM	http://edgar.jrc.ec.europa.eu/news_docs/jrc-2016-trends-in-global-co2-emissions-2016-report-103425.pdf
SHERPA tool (Screening for High Emission Reduction Potential on Air)	http://europa.eu/!xW38RT	http://aqm.jrc.ec.europa.eu/sherpa.aspx
Biofuels from algae: technology options, energy balance and GHG emissions: Insights from a literature review (JRC report)	http://europa.eu/!Mp66Uy	https://ec.europa.eu/jrc/en/publication/eur-scientific-and-technical-research-reports/biofuels-algae-technology-options-energy-balance-and-ghg-emissions-insights-literature
Improvements in the EU gas transmission network between 2009 and 2014 (JRC report)	http://europa.eu/!mB36QW	https://ec.europa.eu/jrc/en/publication/eur-scientific-and-technical-research-reports/improvements-eu-gas-transmission-network-between-2009-and-2014
Resilience of large investments and critical infrastructures in Europe to climate change (JRC report)	http://europa.eu/!mp96df	https://ec.europa.eu/jrc/en/publication/eur-scientific-and-technical-research-reports/resilience-large-investments-and-critical-infrastructures-europe-climate-change
Land use, land-use change and forestry (LULUCF) contribution to the 2030 EU climate and energy policy	http://europa.eu/!yB73Dj	http://publications.jrc.ec.europa.eu/repository/bitstream/JRC102498/lb-na-28025-en-n%20_%20one_file_20%20%281%29.pdf
An economic assessment of GHG mitigation policy options for EU agriculture (EcAMPA 2)	http://europa.eu/!XQ98Qt	http://publications.jrc.ec.europa.eu/repository/bitstream/JRC101396/jrc101396_ecampa2_final_report.pdf
PV status report 2016	http://europa.eu/!gB99MV	http://publications.jrc.ec.europa.eu/repository/bitstream/JRC103426/ldna28159enn.pdf
Clean Energy for All Europeans (EC package)	http://europa.eu/!Gx78Bk	https://ec.europa.eu/energy/en/news/commission-proposes-new-rules-consumer-centred-clean-energy-transition
European Energy Efficiency Platform (E3P)	http://europa.eu/!KN67GX	https://ec.europa.eu/jrc/en/energy-efficiency/e3p
Securing Energy Efficiency to Secure	http://europa.	https://ec.europa.eu/jrc/en/publication/eur-scientific-and-

the Energy Union (JRC report)	eu/!hf43Cw	technical-research-reports/securing-energy-efficiency-secure-energy-union-how-energy-efficiency-meets-eu-climate-and
Generation Adequacy Methodologies Review (JRC report)	http://europa.eu/!Xm39Bp	https://ec.europa.eu/jrc/en/publication/eur-scientific-and-technical-research-reports/generation-adequacy-methodologies-review
Report on energy prices and costs in Europe (EC report)	http://europa.eu/!Vy63hR	http://ec.europa.eu/energy/sites/ener/files/documents/com_2016_769.en_.pdf
Production costs from energy-intensive industries in the EU and third countries (JRC study)	http://europa.eu/!WW78Ky	http://publications.jrc.ec.europa.eu/repository/bitstream/JRC100101/ldna27729enn.pdf

A connected Digital Single Market

The creation of a Digital Single Market for the EU is one of the main priorities of the Commission's mandate. Digital technologies know no borders, but rules and regulations need to be adapted for the economy and society to fully benefit from the digital age. Removing barriers in telecoms regulation, in copyright and data protection legislation, and in the application of competition law can create new opportunities and help the European economy maintain global leadership. For citizens, a Digital Single Market means better access to information and culture and, if equipped with the right digital skills, improved job opportunities.

Two years from its conception, connecting the digital market is in full delivery mode. Using its expertise, the JRC is contributing to strengthening the three pillars of the Commission's Digital Single Market strategy: promoting better access to digital goods and services, creating a level playing field for networks and innovative services, and maximising the growth potential of the digital economy.

'net Bravo' app maps internet signal quality across the EU

The netBravo app is a JRC-developed crowd-sourcing project designed to gather and share radio-spectrum data about mobile telephony coverage, WIFI channel occupancy, broadband and net neutrality connection tests. Anyone with a recent smart phone can download the netBravo app and test the quality of signal they are getting on their phone – WIFI, 4G, 3G, 2G or none. These data are saved locally on the phone and, if the user agrees, are anonymized and sent back to the netBravo research database. The aggregated findings are then displayed on an interactive map on the netBravo website and help researchers and policymakers gain insight into EU-wide connectivity issues. It is mutually beneficial to the users and researchers and a great example of how scientific advances can serve both policymaking and consumer access to services.

netBravo was launched just before the summer holidays and is free to download on both iOS and Android systems. Since its release, it has been downloaded 11.986 times. Data from 52.210 speed tests; 4 million cellular network measurements; and 3 million Wifi hotspot measurements from locations across the EU have been uploaded to the web-service.

DigCompOrg: helping educational organisations go digital

JRC scientists have designed the first pan-European conceptual model to help educational organisations self-assess the use and integration of digital technologies and resources in the learning process. This European Framework for Digitally Competent Educational Organisations (DigCompOrg) model is a web-based resource for policymakers to help them design policies and their effective deployment at regional, national and European levels.

The framework supports the Commission's objectives of improving digital skills and learning, and aligns with the Opening up Education, which aims to stimulate ways of learning and teaching through digital technologies and digital content.

The DigCompOrg initiative can be used for self-assessment and developing or refining strategies to embrace digital-age learning at all levels of the educational journey. It is addressed to primary and secondary schools, vocational education and training centres, as well as higher education institutions. Public authorities in Member States can also use it to adapt their support to educational institutions.

New business models: online platforms and the collaborative economy

The launch of the Digital Single Market strategy has brought about a comprehensive assessment of the social and economic role of new players – such as online market

places, search engines, payment systems, social media, video and content-sharing sites. The goal is to make sure consumers benefit from the new opportunities and that the rules are relevant and effective despite the large diversity of online platforms. The JRC contributed with the economic policy background, reviewing platforms from a regulatory angle, potential market failures, competition policy, consumer protection and data protection instruments. The report underlined how online platforms in general, as an alternative business model, can benefit both consumers and producers while also challenging incumbent players and business models in many sectors, and can put pressure on the existing regulatory framework. This is particularly the case for sharing or collaborative economy platforms that facilitate direct market access for small producers.

These new business models were also in the spotlight in 2016, notably with the adoption of the EC's agenda for the collaborative economy. The JRC has developed a research agenda in that field to strengthen the scientific evidence base for the development of policies that maximise the benefits and minimise the costs for all the stakeholders involved. Based on an analysis of more than 100 collaborative platforms, JRC research tackled the need for more data, trust and transparency, evaluated the impact on the labour market, and addressed social rights in this new work environment.

E-commerce – exploring geo-blocking issues

Delivering on its Digital Single Market and Single Market strategies, the EC has presented a three-pronged plan to boost e-commerce by tackling geo-blocking, making cross-border parcel delivery more affordable and efficient, and promoting customer trust through better protection and enforcement.

Two JRC studies have contributed to the impact assessment that accompanies the draft Regulation tackling geo-blocking. The first report analysed potential welfare effects of policy initiatives to remove geo-blocking practices in the EU Digital Single Market and concluded that both consumer welfare and company profits would increase, by 1.2 % and 1.4 %, respectively. The report focused on sales of four electronic products (smartphones, tablets, laptops and desktop computers) in 10 EU countries (Belgium, Denmark, France, Germany, Italy, Netherlands, Poland, Slovakia, Spain and the United Kingdom), which together represent around 85 % of the EU-28 markets for the different product categories considered.

The second report analysed geo-blocking and concluded that electrical appliances, electronics and computer games in particular are difficult to buy online from another country. The least geo-blocked category is travelling services. JRC researchers analysed data collected through a shopping survey where individuals from different countries try to buy from websites in other countries to explore the different stages in the online purchasing process and detect those factors that contribute to geo-blocking. The findings indicate that 63 % of cross-border purchase attempts are geo-blocked, most often at the delivery stage. Geo-blocking is independent of distance, but less likely between countries sharing the same language.

Smarter digital tachographs strengthen road safety

Smart tachographs are the new generation of mandatory on-board digital recorders to enforce EU legislation on driving and resting times for lorry and bus drivers. In March 2016, the EC adopted legislation defining new technical specifications for smart tachographs, which must be implemented by 2019.

For more than a decade, the JRC has been involved in the design and implementation of the digital tachograph. Its contribution to these new specifications was substantial and relied on two essential services under the JRC's lead: the European Root Certification Authority (ERCA), which oversees the digital security of tachographs and generates the electronic certificates, thereby ensuring the integrity and authenticity of the recorded data, and the Laboratory for Interoperability Certification (DTLab) responsible for issuing

the final certificate needed for the type-approval and entry into the market of the new tachograph equipment.

As a result of the smart tachographs' new specifications, advanced digital technology features such as satellite positioning, short-range communication for road enforcers, and interconnection with other telematics applications will allow better enforcement of driving and resting times, making fraud more difficult, whilst enhancing road safety and reducing time-consuming roadside checks for compliant road operators.

Commission signs an agreement with industry on cybersecurity

Cybersecurity incidents are on the rise year-on-year worldwide across all industry sectors and are threatening our ability to fully realise the growth potential of the digital economy.

In July 2016, the Commission launched a new public-private partnership (PPP) on cybersecurity, which is expected to trigger EUR 1.35 billion of investment from the private sector by 2020. The agreement was part of a series of new initiatives on the Digital Single Market agenda to better equip Europe against cyber-attacks and to strengthen the competitiveness and innovation of its cybersecurity industry.

The JRC supported the establishment of this contractual PPP with a number of key contributions. In 2016, it carried out an analysis of the cybersecurity standardisation and certification landscape to identify possible opportunities for developing the European cybersecurity industry, and issued recommendations for a European lightweight cybersecurity labelling framework. The JRC also participated in the preparation of a roadmap for a possible European ICT security certification framework proposal, to be published by the EC.

Earth observation intelligence – a handy tool for European citizens

MYGEOSS is a two-year project (2015-2016) managed by the Directorate-General for Research and Innovation and carried out by the JRC. The project aims to raise European innovators' awareness of the business potential of open datasets made available through GEOSS (Global Earth Observation System of Systems) and at the European level, and to develop smart internet applications using GEOSS-based open data.

Three calls were made for innovative applications, and the project culminated in the selection of 36 innovative ideas from across the EU, authored by SMEs, research institutions and individual developers.

These ideas all share a common goal: to turn environmental open data into actionable knowledge about changes affecting our environment.

The winning apps were showcased in a final workshop held in December 2016, during which the JRC also presented three apps developed in-house: Invasive Alien Species in Europe for the identification of invasive species threatening European environment; MyNatura2000 that raises awareness of nearby nature reserves and the threats they face; and AirSenseEur on local air quality.

All applications, together with their detailed descriptions and the source codes (available for reuse by anyone interested) are available from the MYGEOSS website.

European Digital Progress Report 2016

In May 2016, the EC released a report giving an overview of the progress made by Member States in the field of digitalisation. It also details the policy responses by Member States to addressing their specific challenges. The report is based on statistical data from the JRC's multi-annual research project 'Prospective Insights in ICT R&D'

(PREDICT).

The PREDICT project analyses the supply of information and communications technologies (ICT) and research and development (R&D) in ICT in Europe, and compares it to major competitors worldwide. The PREDICT 2016 dataset covers data from 40 countries, based on available data for the period 2006-2013.

The Digital Progress Report covers key indicators across all Member States: connectivity (broadband access), human capital (digital inclusion and skills), internet usage, digitalisation of industry, digital public services, and R&D. It also includes country-specific chapters that notably show a digital divide between some very advanced EU Member States (e.g. Nordic countries) and others that are lagging behind.

By combining quantitative evidence with country-specific policy insights, the report tracks the progress made in the Member States and provides important feedback for policymaking at EU level.

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Text	Short URL	Original URL
netBravo app (Android and iOS download)	no need	http://www.netbravo.eu/
European Framework for Digitally Competent Educational Organisations (DigCompOrg)	http://europa.eu/!Cf88Vf	https://ec.europa.eu/jrc/en/digcomporg
Promoting Effective Digital-Age Learning: A European Framework for Digitally-Competent Educational Organisations (JRC report)	http://europa.eu/!RQ93vD	http://publications.jrc.ec.europa.eu/repository/bitstream/JRC98209/jrc98209_r_digcomporg_final.pdf
An Economic Policy Perspective on Online Platforms (JRC report)	http://europa.eu/!pd46dX	https://ec.europa.eu/jrc/en/publication/eur-scientific-and-technical-research-reports/economic-policy-perspective-online-platforms
Scoping the Sharing Economy: Origins, Definitions, Impact and Regulatory Issues (JRC report)	http://europa.eu/!Qk49HN	https://ec.europa.eu/jrc/en/publication/eur-scientific-and-technical-research-reports/scoping-sharing-economy-origins-definitions-impact-and-regulatory-issues
The economic impact of removing geo-blocking restrictions in the EU Digital Single Market (JRC report)	http://europa.eu/!FW98Nr	https://ec.europa.eu/jrc/en/publication/eur-scientific-and-technical-research-reports/economic-impact-removing-geo-blocking-restrictions-eu-digital-single-market
International Trade in Online Services (JRC report)	http://europa.eu/!RD87qv	https://ec.europa.eu/jrc/en/publication/eur-scientific-and-technical-research-reports/international-trade-

		online-services
Road safety: the digital tachograph	http://europa.eu/!CQ38Jw	https://ec.europa.eu/jrc/en/research-topic/road-safety-digital-tachograph
Strenghtening Europe's Cyber Resilience System and Fostering a Competitive and Innovative Cybersecurity Industry (EC Communication)	http://europa.eu/!nd97Tu	https://ec.europa.eu/digital-single-market/en/news/communication-strenghtening-europes-cyber-resilience-system-and-fostering-competitive-and
JRC activities related to cybersecurity	http://europa.eu/!dK77tR	https://ec.europa.eu/jrc/en/research-topic/cybersecurity
MYGEOSS website	http://europa.eu/!Dh38WU	http://digitalearthlab.jrc.ec.europa.eu/node/57752
European Digital Progress Report	http://europa.eu/!pg37PM	https://ec.europa.eu/digital-single-market/en/european-digital-progress-report
'Prospective Insights in ICT R&D' (PREDICT)	http://europa.eu/!Mp79JN	https://ec.europa.eu/jrc/en/predict

A deeper and fairer Economic and Monetary Union

Delivering a deeper and fairer Economic and Monetary Union (EMU) is one of President Juncker's top 10 priorities. The European Semester is an important tool to promote economic convergence amongst Member States and contribute to achieving this goal. The Commission's work on completing the EMU builds on the so-called Five Presidents' Report, which describes how to improve the European Semester and sets out four areas of work: the economic union, the financial union, the fiscal union and the political union.

In 2016, the JRC contributed to achieving a deeper and fairer EMU by developing tools, methods and analyses. For the Economic Union, it worked on macroeconomic imbalances, Member States' output gap and the effectiveness of Cohesion Funds. For the Financial Union, it looked into the use of the euro currency in international trade, Capital Markets Union, financial stability and the completion of the Banking Union. For the Fiscal union, the JRC analysed the possible impacts of common corporate taxation plans.

Contributing to the European Semester

In 2016, the JRC contributed to multiple activities related to the European Semester policy cycle.

The Directorates-General for Economic and Financial Affairs, Employment and Social Affairs, and Taxation and Customs Union asked the JRC to provide tax modelling for the 2016 European Semester. The JRC analyses based on the EUROMOD microsimulation model were extensively used and referred to in five Country Reports, which provide the technical underpinning to the Country Specific Recommendations published in May.

The Global Multi-Country model developed by the JRC and the Directorate-General for Economic and Financial Affairs was used in the European Economic Forecasts documents (Spring and Autumn releases) in order to quantify the supply, demand and foreign drivers expected to affect GDP forecasts.

The JRC proposed to the Output Gap Working Group (OGWG) of the EU's Economic Policy Committee a new model-based procedure to incorporate information about structural unemployment in the calculations of the cyclical position of Member States economy, in order to assess the sustainability of their public finances. This methodology was presented to the OGWG and forwarded to the Economic and Financial Committee which endorsed it.

Modelling the impact of Cohesion Policy

EU regional policy supports job creation, business competitiveness, economic growth, sustainable development, and quality of life in all EU regions. It is delivered through the European Regional Development Fund (ERDF), the Cohesion Fund (CF) and the European Social Fund (ESF).

In 2016, the JRC carried out an evaluation of EU Cohesion Policy for the period 2007-2013 by analysing the investments financed by these funds. RHOMOLO, a JRC-developed spatial computable general equilibrium model, was used to conduct a set of simulations and assess the impact of these investments at regional and sectoral level.

The JRC report on the results of the simulations confirmed that the impact of the Cohesion Policy is positive and sizeable, particularly in regions receiving a high level of funding compared to their GDP and in regions well integrated with the main beneficiaries. Over the medium to long term, the estimated impact ranges from 0.2% to 9% of additional GDP across all EU regions.

The RHOMOLO model is used for policy impact assessment and provides sector-, region- and time-specific simulations to support EU policy-making on investments and reforms

covering a wide array of policies. The European Investment Bank will also be using it for the next three years for its investments, including for the so-called Juncker Plan.

JRC support to Capital Markets Union

In the context of the Capital Markets Union Action Plan, the EC published in April its annual 'European Financial Stability and Integration Review' (EFSIR), which provided an overview of the performance of financial markets and indicators for monitoring their trends and macroeconomic developments. The JRC contributed by analysing the sensitivity of European stock markets to local and external shocks and by measuring integration in European financial markets.

JRC analysis for the 1999-2015 period showed that financial shocks during the EU sovereign crisis hit distressed countries (Greece, Ireland, Italy, Portugal and Spain) stronger than Eastern countries, especially those of the euro area, mostly dominated by local influences.

Euro area distressed countries also present lower financial markets integration compared to Euro area core countries (Austria, Belgium, Finland, France, Germany and The Netherlands), with the largest gaps appearing in 2002-2004 (due to Ireland and Greece) and in 2013, triggered by the Greek sovereign crisis. Local or regional influences dominate in non-Euro area Eastern countries, whose capital markets' integration with the rest of Europe is less developed.

Helping to secure financial stability and completing the banking union

Following the outbreak of the financial crisis, the EU has put forward ambitious reforms to secure financial stability and improve supervision of the banking sector. The JRC continued to contribute to this agenda in 2016, notably by putting its Systemic Model of Banking Originated Losses (SYMBOL) to good use.

As part of the Fiscal Sustainability Report published annually by the Directorate-General for Economic and Financial Affairs, the JRC used the SYMBOL model to estimate the vulnerability of public finances to banking crises. The analysis shows that the new regulatory framework significantly reduces the need for government intervention, as losses will be absorbed by other regulatory tools (more capital, resolution funds ...).

SYMBOL also enabled the Impact Assessment of the Capital Requirement Regulation II, which transposes into EU law the latest international agreements reinforcing the banking sector's resilience. The JRC quantified the new framework's ability to protect public finances and taxpayers from the burden of banking crises.

Finally, SYMBOL helped demonstrating that the envisioned European Deposit Insurance Scheme (EDIS), a single scheme to enhance depositor protection against large financial local shocks, will fare better than any alternative option for a pan-European deposit insurance.

No major obstacles to the use of the euro in international trade

The international trading currency status of the Euro affects firms in the euro area. In 2015, the Eurogroup invited the EC to look into possible obstacles to using the euro in international trade.

In close collaboration with the Directorate-General for Economic and Financial Affairs the JRC analysed micro-aspects of the use of the euro in international trade invoicing and settlement, to understand factors driving or preventing its use. The JRC designed two surveys on the basis of existing literature to examine this issue across selected sectors.

Findings were published in a report, also delivered to the Eurogroup, which suggests that

the euro is widely used in international trade. Almost 80 % of euro-area companies invoice 76-100 % of their non-euro-area exports in euro, and 67 % do not use any other currency. Some micro-level obstacles were found to hamper the use of the euro in specific sectors: for instance, the oil or aviation industries traditionally invoice in US dollars due to the global nature of their trade.

The report concluded that sound macroeconomic policies, further strengthening of the EMU and the development of the Capital Markets Union are key factors that can further strengthen the role of the euro on the global trade and finance markets.

Common corporate taxation across the EU

Corporate taxation is under increased scrutiny as concerns continue to rise about the efficiency of the existing arrangements. Tax avoidance practices have become very elaborate and make it ever more challenging for governments to establish where profits are generated and to tax companies accordingly.

In October 2016, the EC announced plans to overhaul corporate taxation in the Single Market and deliver a growth-friendly and fair system based on a single set of rules for private companies to calculate their taxable profits: the Common Consolidated Corporate Tax Base(CCCTB). The initiative belongs to the EMU's Fiscal Union pillar.

In support of this package, the JRC provided a macroeconomic impact analysis of the proposals both on their own and in combination with policies that would reduce or eliminate the debt bias in traditional corporate tax rules. The JRC also provided analysis on the implications of a CCCTB on companies R&D. The results of the JRC evaluation suggested that a fairer and more efficient tax system can be introduced whilst maintaining, and perhaps even improving, GDP growth and welfare in the EU.

Social dimension of the EMU

The JRC organised a Research Forum with the College of Europe and the European Policy Strategy Centre, to better understand tools and methods that could support policy responses for building social fairness.

READ MORE

Text	Short URL	Original URL
Invoicing Currencies in International Trade - Drivers and Obstacles to the Use of the Euro (JRC report)	http://europa.eu/!Tw38cF	https://ec.europa.eu/jrc/en/publication/eur-scientific-and-technical-research-reports/invoicing-currencies-international-trade-drivers-and-obstacles-use-euro
European Financial Stability and Integration Review (EFSIR): A focus on the Capital Markets Union Initiative	http://europa.eu/!rM89RR	http://ec.europa.eu/finance/financial-analysis/docs/efsir/160425-efsir-2016_en.pdf
Measuring financial integration in Europe: a price-based approach for equity and bond markets (JRC report)	http://europa.eu/!FU46Kg	https://ec.europa.eu/jrc/en/publication/measuring-financial-integration-europe-price-based-approach-equity-and-bond-markets
Modelling corporate tax reform in the EU: New simulations with the	http://europa.	https://ec.europa.eu/jrc/sites/jrc

CORTAX model (JRC working papers)	eu/!qj96TQ	sh/files/jrc104678.pdf
The impact of cohesion policy 2007-2013 - model simulations with RHOMOLO	http://europa.eu/!fp43cV	http://ec.europa.eu/regional_policy/sources/docgener/evaluation/pdf/expost2013/wp14b_final_report_en.pdf
JRC work on Financial Markets regulation	http://europa.eu/!gG47vk	https://ec.europa.eu/jrc/en/research-topic/financial-markets-regulation
Effects analysis on the European deposit insurance scheme (EDIS)	http://europa.eu/!qG84qC	http://ec.europa.eu/info/file/83897/download_en?token=tIIiMUUl

A deeper and fairer internal market with a strengthened industrial base

The EU has the largest Single Market in the world. The reforms set out in the Single Market Strategy seek to unlock its full potential and create the right conditions for the sustainable competitiveness of the European economy.

In 2016, the JRC contributed to this ambitious objective via a number of activities. Research into raw-material-dependent sectors aimed to help transform strategic EU industries into more resilient ones. Standardisation and streamlining work in ICT, transport, the steel industry, and alcohol denaturants contributed to the continuous improvement of integration into the Single Market, which should enable job creation, economic growth, increased competitiveness, innovation and industrial leadership.

Last but not least, the environmental dimension of sustainable competitiveness was not left behind, with the JRC contributing to new, more stringent emission requirements for industrial and chemical installations. [943]

Supply of raw materials critical to strategic EU industries

The sustainable and secure supply of raw materials to the EU is essential to industry. By addressing this, the EU policy on raw materials aims to diversify supply and improve conditions for domestic production and circular use. In 2016, the JRC undertook a number of activities in this field.

Together with the Directorate-General for Internal Market, Industry, Entrepreneurship and SMEs, and the European Innovation Partnership on Raw Materials, the JRC produced the first biannual EU Raw Materials Scoreboard. This Scoreboard highlights the status of the sustainable and secure supply of raw materials to the EU, illustrating their vital role to the competitiveness and growth of several sectors. The Scoreboard provides indicators for primary raw materials from e.g. mining within the EU and imports, as well as from secondary sources from e.g. recycling. It addresses raw materials in the global context in terms of competitiveness and innovation, framework conditions for mining, the circular economy and recycling, as well as environmental and social sustainability. This Scoreboard, together with the Resource Efficiency Scoreboard, provides inputs for monitoring the Circular Economy.

In the context of the European Defence Action Plan, a JRC study identified 39 raw materials that are critical for the European defence industry as they are required to produce very specialised, high-performance, processed materials. About half of these raw materials are imported from outside the EU, raising concerns over security of supply.

A new JRC study presented in December at the 9th Conference of the European Strategic Energy Technology Plan (SET-Plan) indicated that the EU is vulnerable to supply bottlenecks for several key materials needed in wind, photovoltaic and electric vehicle technologies, and that its resilience to potential supply issues will deteriorate if mitigation measures are not taken.

Scientific input critical to standardisation across all sectors

Robust standards are key contributors to a vibrant Single Market. In recent years, the JRC has naturally been very active in the standardisation community, notably through its close collaboration with institutional and industry partners alike.

In 2016, the JRC's scientific input in standardisation took many different forms; some of the most notable are mentioned below.

In June, a Joint Initiative for Standardisation was launched with the aim of modernising

the current standard-setting partnership, with more effective involvement by the relevant stakeholders – industry, European standardisation organisations, SMEs and all other interested parties. A JRC foresight study on fast-evolving and integrated standards as key to innovation in the next decade supported the reflections on designing such an initiative; and JRC experts were members of the editorial committee that put the initiative together.

In August, the European project 'MetroMetal' (Metrology for European Metal industry), saw JRC scientists collaborating with 13 national metrological institutes to develop measurement methods and calibration standards for reliably measuring radioactive contamination in cast steel products. The exercise resulted in two new reference standards for Cobalt-60 (^{60}Co) in cast steel, which will greatly help metal works with quality control and safe use.

In September, the JRC together with the European Committee for Standardization, the European Committee for Electrotechnical Standardization, and the Directorate-General for Internal Market, Industry, Entrepreneurship and SMEs co-organised the fourth 'Putting Science into Standards' workshop, on the subject of 'Driving Towards Decarbonisation of Transport: Safety, Performance, Second life and Recycling of Automotive Batteries for e-Vehicles'. The workshop was held at the JRC's Petten (NL) site and notably targeted the identification and prioritisation of the standardisation and pre-normative research needs for automotive batteries to guide further deployment of e-mobility.

In October, the JRC published a manual on advanced methodologies for developing national seismic and climatic maps to be used for the design of buildings with the Eurocodes. The manual makes possible the worldwide use of the best practices and experience that come from EU countries in implementing European design standards for safe, resilient and sustainable buildings.

Reducing harmful emissions from industrial and chemical installations

Two important Best Available Techniques (BAT) conclusions were adopted last year, based on the work of the JRC's European Integrated Pollution Prevention and Control Bureau (EIPPCB).

BAT conclusions are Commission Implementing Decisions adopted under the Industrial Emissions Directive (IED) 2010/75/EU, which regulates the emissions into the air, water and soil of about 50 000 industrial installations across the EU. BAT reference documents that incorporate these conclusions provide important guidance to national authorities on setting permit conditions for producers in the relevant field, as stipulated by the IED.

A first set of BAT conclusions for Common Waste Water and Waste Gas Treatment/Management Systems in the Chemical Sector was published in May, which notably included nine BAT-associated emission levels for direct discharges into a receiving water body (for total organic carbon/chemical oxygen demand, total suspended solids, total (inorganic) nitrogen, total phosphorus, absorbable organically bound halogens, chromium, copper, nickel and zinc).

A second set for the non-ferrous-metal industries was published in June, which addressed in particular environmental management systems; energy recovery; process control; waste gas management, diffuse emissions prevention and collection and emissions to air; waste water management, collection and treatment; and odour and noise emissions.

European harmonisation of the complete denaturing of alcohol

Denaturants are strong-smelling or bitter-tasting substances used to make alcohol unfit for human consumption. Denatured alcohol is not subject to excise duty applied on alcohol and alcoholic beverages. It is used, for example, in screen-wash fluid, perfumes

and solvents. Before this harmonisation exercise, the large number of substances used as denaturants complicated controls of denatured alcohol moving in the internal market. Furthermore, the harmonised procedure makes it harder to recover alcohol from products exempt from alcohol duty, which would lead to considerable financial loss for Member State authorities.

JRC scientists, together with the Directorate-General for Taxation and Customs Union and Member State experts, have contributed to EU-level efforts to reduce fraud and tax evasion on alcoholic beverages by harmonising denaturing practices.

As a result, a regulation was adopted which introduced a single EU method for the complete denaturing of alcohol, bringing down the number of substances used as alcohol denaturants from more than 30 different chemicals to just three: denatonium benzoate, isopropyl alcohol, and methyl ethyl ketone (butanone).

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Text	Short URL	Original URL
EU Raw Materials Scoreboard	http://europa.eu/!hn64jf	https://bookshop.europa.eu/en/raw-materials-scoreboard-pbET0416759/
Raw materials in the European defence industry	http://europa.eu/!XC93qQ	http://publications.jrc.ec.europa.eu/repository/bitstream/JRC98333/raw%20materials%20in%20the%20european%20defence%20industry_online%20report.pdf
Assessment of potential bottlenecks along the materials supply chain for the future deployment of low-carbon energy and transport technologies in the EU (JRC study)	http://europa.eu/!yG86gg	http://publications.jrc.ec.europa.eu/repository/bitstream/JRC103778/materials%20supply%20bottleneck_online%20version.pdf
Joint Initiative for Standardisation	http://europa.eu/!gF63nW	http://ec.europa.eu/growth/tools-databases/newsroom/cf/itemdetail.cfm?item_id=8852
How will standards facilitate new production systems in the context of EU innovation and competitiveness in 2025? (JRC foresight study)	http://europa.eu/!PD79rp	https://ec.europa.eu/jrc/publication/eur-scientific-and-technical-research-reports/how-will-standards-facilitate-new-production-systems-context-eu-innovation-and
Putting Science into Standards Workshop: Driving Towards Decarbonisation of Transport	http://europa.eu/!Qh49UT	https://ec.europa.eu/jrc/en/event/workshop/putting-science-standards-driving-towards-decarbonization-transport
European Integrated Pollution Prevention and Control Bureau (EIPPCB)	http://europa.eu/!Mg33rU	http://eippcb.jrc.ec.europa.eu/
BAT conclusions for Common Waste	http://europa.	http://eur-lex.europa.eu/legal-content/EN/TXT/?uri=uriserv:OJ.

Water and Waste Gas Treatment	eu/!Dy66xm	L .2016.152.01.0023.01.ENG
BAT conclusions for the non-ferrous-metal industries	http://europa.eu/!HU37QG	http://eur-lex.europa.eu/legal-content/EN/TXT/?uri=uriserv:OJ.L .2016.174.01.0032.01.ENG&toc=OJ:L:2016:174:TOC
REGULATION (EU) 2016/1867 on the mutual recognition of procedures for the complete denaturing of alcohol	http://europa.eu/!mt74Yr	http://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32016R1867&qid=1479391379298&from=FR

Towards a new policy for migration

This year, migration climbed to the top of the political agenda as a continuous influx of migrants converged towards Europe from destabilised regions of the world, mainly the Middle East and Northern Africa. In his 2016 State of the Union speech, President Juncker underlined progress in regaining control of irregular migration flows and stopping the daily tragedy of deaths in the Mediterranean and the Aegean Sea. He also praised the solidarity of EU Member States for providing shelter to over 1 million Syrian refugees. Finally, he emphasised the need to maintain and step up efforts to address migration humanely, while re-emphasising the need for the strong protection of the EU's external borders.

Throughout 2016, the JRC contributed to these objectives by means of a number of important activities such as setting up a Knowledge Centre on Migration and Demography, developing a methodology for automatic fingerprint identification, and looking into how to integrate immigrants more successfully by improving access to education.

Improving data and knowledge on migration and demography

In June, in an effort to enhance the EU's capability in better managing opportunities and challenges from migration and demographic change, the European Commission launched a Knowledge Centre on Migration and Demography (KCMD). This initiative led by the JRC aims to provide policy-relevant knowledge and evidence-based analysis to EU policymaking in order to better anticipate future migration flows and population trends and to better understand their impact on the EU health, welfare, education system, economy and society.

The work of the KCMD will also involve building strategic partnerships and networking across and beyond Europe. The first partnership with the International Institute for Applied Systems Analysis (IIASA) has set up a Centre of Expertise on Population and Migration to provide multi-dimensional assessments of future population trends in Europe, as well as in the main regions of origin of the migration into Europe.

The Knowledge Centre has already generated two substantial outputs: the Migration Data Catalogue and the Dynamic Data Hub, which offer users processed information from aggregated data sources, such as Eurostat, OECD, Frontex and the International Labour Organisation. The Migration Data Catalogue is an inventory of more than 100 existing data sets.The Dynamic Data Hub provides web-based direct access to individual datasets, allowing the display of EU migration at a glance.

Smart borders: towards automatic fingerprint identification

Preserving the Schengen area and freedom of movement within the EU goes hand in hand with strong protection of the EU's external borders. In April, the EC adopted a legislative package on Smart Borders. The package includes a Communication on Stronger and Smarter Information Systems for Borders and Security, which aims to improve the functioning and interoperability of existing information systems and potential new systems to address information gaps.

Among the actions proposed in the Communication, by mid-2017 a fingerprint search functionality will be added to the Schengen Information System (SIS) through an Automated Fingerprint Identification System (AFIS). This change was enabled by a JRC study, which concluded that the AFIS technology has reached sufficient levels of readiness and availability for its integration into the second-generation Schengen Information System (SIS-II), providing that a number of recommendations are followed. These recommendations applied to areas such as national expertise and best practice; selection of appropriate formats to collect, exchange and process data; production of statistics; identification of appropriate architecture options; application of rigorous

procedures for biometric enrolment; selection of measures to foster quality; definition of use-case scenarios, and the introduction of regular performance-evaluation actions.

The EC has also presented a revised proposal for a Regulation on the establishment of an Entry-Exit System to speed-up, facilitate and reinforce border-check procedures for non-EU nationals travelling to the EU.

Integrating migrants: education and vocational training are key to addressing disadvantages

Once migrants have reached EU territory and have overcome all the administrative hurdles to become immigrants, their satisfactory integration is important. A JRC study on 'Educational outcomes and immigrant background', carried out at the request of the EC's Directorate-General for Education and Culture, analysed the educational performance of children and young adults, and the skills of the working-age population, making a comparison between immigrants and native Europeans.

Among many interesting findings, the study revealed that migrants who arrived before the age of 15 generally perform almost as well as their native counterparts at school, and in any event better than first-generation adult migrants. First-generation adult migrants have a low achievement rate exceeding 30 % in disciplines such as mathematics, science and reading in most countries across the EU. In some countries with a tradition of attracting highly educated migrants, such as the UK, Ireland and Luxembourg, there are first-generation migrant students who perform better in mathematics than their top-performing native counterparts. Sweden appears to have the education system that is the most successful in reducing the gap between natives and first-generation migrants arriving in the EU aged under 15. It also seems able to completely overcome the gap between natives and second-generation immigrants.

The report also showed that a significant share of migrant human capital is underused; particularly those with higher skill levels who tend to have a lower rate of employment than natives. The study has contributed to a wider effort towards understanding immigrants' journey through education leading to qualifications and skills in support of improving integration policies in the EU.

READ MORE

Text	Short URL	Original URL
Knowledge Centre on Migration and Demography	http://europa.eu/!mQ74CK	https://ec.europa.eu/jrc/en/migration-and-demography
Migration Data Catalogue	http://europa.eu/!bv97rw	https://bluehub.jrc.ec.europa.eu/catalogue
Dynamic Data Hub	http://europa.eu/!HN64Cu	https://bluehub.jrc.ec.europa.eu/migration/app/index.html
Fingerprint identification technology for its implementation in the Schengen Information System II (SIS-II) (JRC report)	http://europa.eu/!yR46nk	https://ec.europa.eu/jrc/publication/eur-scientific-and-technical-research-reports/fingerprint-identification-technology-its-implementation-schengen-information-system-ii-sis
Educational outcomes and	http://europa.	https://ec.europa.eu/jrc/en/publication/educational-outcomes-

immigrant background (JRC report)	eu/!tc67PF	and-immigrant-background
Migration Data Catalogue	http://europa.eu/!bv97rw	https://bluehub.jrc.ec.europa.eu/catalogue
Dynamic Data Hub	http://europa.eu/!HN64Cu	https://bluehub.jrc.ec.europa.eu/migration/app/index.html
Communication on Stronger and Smarter Information Systems for Borders and Security	http://europa.eu/!Pp48Rv	http://ec.europa.eu/dgs/home-affairs/what-we-do/policies/securing-eu-borders/legal-documents/docs/20160406/communication_on_stronger_and_smart_borders_20160406_en.pdf
JRC study on 'Educational outcomes and immigrant background'	http://europa.eu/!Bw34Nm	http://publications.jrc.ec.europa.eu/repository/bitstream/JRC102629/educational%20outcomes%20and%20immigrant%20background_revisions%20accepted%20sf%20final.pdf

A stronger global actor

In an increasingly connected, contested and complex world, the coherence of the EU's external action and the Commission's ability to use all available instruments consistently are becoming ever more important. Challenges such as migration, access to resources, and climate change call for an effective international presence of the EU. This is all the more essential considering that few of the EU's internal policy objectives can be met in isolation of their external context. The EU should also take every opportunity to advance its humanistic values on the global stage.

As in previous years, the JRC is taking an active role in supporting the EC as a stronger global actor by contributing to a significant variety of activities in areas such as global safety and security, crisis management, disaster-risk reduction, and the monitoring of natural and man-made hazards. Below are examples of the efforts made and the achievements in this area in 2016.

JRC tools support EU commitments to address humanitarian crises

At the occasion of the first World Humanitarian Summit, the EU committed to 100 actions to support UN Secretary-General's Agenda for Humanity, which aims to prevent and reduce human suffering linked to humanitarian crises around the world. These EU commitments will be supported by a series of Commission tools: the following have been developed with the JRC's support.

The Early Warning System for Conflict, based on the JRC's Global Conflict Risk Index (GCRI), will enable the identification and anticipation of risks of conflict or conflict escalation to help prioritise resources. The GCRI also feeds into the Index for Risk Management (INFORM), the first global open-source risk assessment tool for humanitarian crises and disasters.

The Global Disaster Alert and Coordination System (GDACS), developed by the UN and the JRC, will allow for better integration of transnational detection and early-warning and alert systems, thereby enabling a faster response to major disasters.

The JRC's Disaster Risk Management Knowledge Centre (DRMKC) will allow the EU to further engage with the research community to bridge disaster-risk-management knowledge and technology gaps and to encourage a stronger science-policy interface in decision-making.

JRC and international partners join forces to assess food insecurity

In 2016, 240 million people in 45 low-income or conflict-ridden countries were affected by food scarcity (80 million of whom endured a more severe state of 'food crisis') and 41.7 million were in countries affected by droughts caused by the El Niño climate phenomenon.

Given the unprecedented magnitude of these crises, the EC and the United Nations' Food and Agriculture Organisation (FAO) and World Food Programme (WFP) decided to conduct the first joint assessment of global food security, rather than carry out their own independent ones.

JRC scientists led the report with contributions from the FAO and the WFP. Published in April, it identified countries and regions where extreme weather and/or armed conflicts caused 'food crisis hot spots' requiring priority assistance.

Earlier in 2016, the JRC had published a report and issued a joint statement with the FAO, the WFP and the Famine Early Warning Systems Network warning about El Niño's devastating impact on southern Africa's harvests and food security.

From food security to energy security in Sub-Saharan Africa

Sub-Saharan Africa (SSA) is one of the regions where the JRC continued to contribute actively to development efforts in 2016.

The African Postharvest Losses information System (APHLIS) has been expanded into APHLIS+, which covers an increased scope of crop varieties, has more accurate estimation models and extends its horizon to 2020. This system, originally developed by the JRC with partners and now passed to operational use funded by charitable organisations, enables countries and actors in the food supply chain to identify where losses are occurring and show appropriate good practices to mitigate losses. New work involves designing an early-warning system to identify grains contaminated with carcinogenic aflatoxins, and insect and pest attacks that destroy harvested crops.

In September, a JRC paper published in *Nature Energy* looked into electricity-generation options in SSA, which could potentially bring sustainable electricity to 15.4 million people. The authors promoted the use of existing energy infrastructure as a lower-cost, lower-risk approach to boosting private investment and speeding up the deployment of renewable energy systems.

Support to Strengthening technical capacities in nuclear security at European and International levels

Nuclear security is an area where the JRC's science and technology expertise is invaluable in cooperating with the EU Member States and international partners.

Initiatives worth mentioning include the JRC's European Nuclear Security Training Centre (EUSECTRA), and the ITRAP+10 test campaign. Since its launch, EUSECTRA has instructed front-line officers, trainers and experts from over 70 countries on how to detect and respond to illicit trafficking of radioactive and nuclear materials. The ITRAP+10 is an EU-US initiative to evaluate the performance of commercially available radiation-detection equipment against international standards, which in its second phase (2014-2017), has been fully implemented by the JRC.

In November, the JRC and Directorate-General for Migration and Home Affairs organised the first EU High Level Scenario-Based Exercise on Nuclear Security – APEX Europa, focusing on the unique characteristics of the European Union and its Member States in the preparedness to a nuclear security event. National institutions representatives from 26 out of the 28 Member states gathered for one day of scenario analysis at the JRC's Karlsruhe premises. Discussions on existing strengths, weaknesses, and needs led to several follow up actions in areas such as detection and border technology, training, cross border field exercises, technical reachback systems or nuclear forensics.

In March 2016, the JRC and the United States Department of State co-organised a high-level workshop to prepare for the 2016 Nuclear Security Summit. More than 70 participants from 30 countries, including delegates from the International Atomic Energy Agency (IAEA), Interpol and the Global Initiative to Combat Nuclear Terrorism discussed best practices and technical challenges in using investigative and technical capabilities against radioactive and nuclear material smuggling. They concluded that close cooperation at national level and information sharing at international level optimize the use of such capabilities to effectively counter nuclear smuggling.

The next day, 20 participants from eight ASEAN (Association of Southeast Asian Nations) countries took part in a nuclear security simulation exercise co-organised by the JRC and IAEA in Ispra. This JRC work aims to strengthen the capacity of our ASEAN partners to detect and respond to radioactive and nuclear material falling outside of regulatory control. The exercise provided a platform for testing communication and cooperation mechanisms, both seen as key issues in detection activities by stakeholders, regulatory authorities and policy organisations.

Enhancement of both EU Member States and international partners capabilities in the area of strategic trade control

Many supports activities are requested by TRADE, FPI or Council presidency, and are implemented by JRC, like the provision of inputs to the Recast text on the EC Regulation 428/2009 on dual use goods. The technical and legal support provided by JRC to DG TRADE in relevant EU committees on Dual-use goods and in the International regimes facilitates the harmonised implementation of export controls in the EU and a level playing field for exporters. JRC also contributes to the harmonized implementation of technical controls by Member States through running and contributing to the EU Pool of Experts on dual-use goods since 2012 and helping the drafting of guidelines for harmonized implementation of export controls. The JRC analyses the technical updates decided by the Nuclear Suppliers Group and Australia Group (chemical and biological controls) international export control regimes, submitting the results to DG TRADE and the Council Working Party on Dual-Use Goods assembling the EU-28 representatives. The JRC supports also part of the amendment to the Dual-use regulation Annex I, i.e. the EU dual-use control list and is recognised by the Member states as a peer-practitioner. This has been recognised by the attribution by the Council Working Party on Dual Use goods of the Coordinating role for the drafting of the technical annexes of the new revised sanctions measures targeting DPRK and Iran.
JRC provides continued policy support to DG DEVCO for the strategy, formulation, terms of reference and evaluation of EU outreach programmes in dual-use export controls. This involves evaluation of on-going activities, background research, trade analysis, methodology and approach necessary to maximise project results. Coordination with US and other donors is key to obtaining effective results. JRC also manages the content for the EU outreach web portal and issues the newsletter. In 2016 the JRC organised and chaired an important Inter-Agency Simulation Exercise for Georgia, Ukraine, Moldova and various EU bordering MS, based on SimEX2015 model.

Launch of the Multi-temporal Global Human Settlement database

The Global Human Settlement Layer (GHSL) is a new global database that tracks human presence on Earth; it was launched in October at the United Nations Conference on Housing and Sustainable Urban Development (Habitat III).

Developed by the JRC, with the support of the Directorate-General for Regional and Urban Policy, the GHSL makes it possible to analyse in detail the development of built-up areas across the whole planet over the last 40 years.

The GHSL is the most comprehensive dataset covering all human settlements, from villages to megacities, and is entirely open and free. It is based on more than 12.4k billion individual image data records collected by different satellite sensors and combines imagery on built-up areas, green areas and night lights with census data on population.

The GHSL shows that over the last 40 years, built-up areas have grown by about 2.5 times globally, while the global population has increased by a factor of 1.8. Changes in population density and built-up areas show major regional differences, with the strongest growth being observed in low-income countries.

Mapping long-term global surface water occurrence

The Global Surface Water Explorer is an online interactive database created by the JRC in collaboration with Google. It presents the Earth's surface water changes over the past three decades through 30-m resolution global maps. It will be useful for climate science, risk management, infrastructural planning and water management works.

Satellite images reveal full extent of destruction following Italy's earthquake

The Copernicus Emergency Management Service, for which the JRC ensures technical coordination, produced maps of the damage caused by the catastrophic earthquake that hit central Italy on 24 August to support a preliminary assessment of the damage carried out by the Italian authorities.

READ MORE

Text	Short URL	Original URL
Early Warning System for Conflict	http://europa.eu/!jm97Dq	http://www.eeas.europa.eu/cfsp/conflict_prevention/docs/201409_factsheet_conflict_earth_warning_en.pdf
Global Disaster Alert and Coordination System (GDACS)	no need	http://www.gdacs.org/
Disaster Risk Management Knowledge Centre (DRMKC)	http://europa.eu/!PG43Xr	http://drmkc.jrc.ec.europa.eu/
Global analysis of food and nutrition security situation in food crisis hotspots	http://europa.eu/!vm64KP	https://ec.europa.eu/jrc/en/publication/eur-scientific-and-technical-research-reports/global-analysis-food-and-nutrition-security-situation-food-crisis-hotspots
The 2015-2016 El Niño event: expected impact on food security and main response scenarios in East and Southern Africa (JRC report)	http://europa.eu/!BW33Jy	https://ec.europa.eu/jrc/node/58887
African Postharvest Losses information System (APHLIS)	no need	http://www.aphlis.net/
APHLIS+	not possible from source domain	http://www.aphlis.net/aphlis-plus/
Identification of advantageous electricity generation options in sub-Saharan Africa integrating existing resources (JRC paper)	not possible from source domain	http://www.nature.com/articles/nenergy2016140
Counter Nuclear Smuggling Workshop 2016	http://europa.eu/!yw48bu	https://ec.europa.eu/jrc/en/news/jrc-itu-usa-co-hosting-counter-nuclear-smuggling-workshop-2016
COSINUS 2016 - COoperation SImulation of NUclear Security	http://europa.eu/!tn49wk	https://ec.europa.eu/jrc/en/event/workshop/cosinus-2016-cooperation-simulation-nuclear-

		security
Global Human Settlement Layer (GHSL)	http://europa.eu/!hT83HF	http://ghsl.jrc.ec.europa.eu/
Atlas of the Human Planet 2016	http://europa.eu/!cx76rw	https://ec.europa.eu/jrc/en/publication/eur-scientific-and-technical-research-reports/atlas-human-planet-mapping-human-presence-earth-global-human-settlement-layer

Table 15-1. Selected examples of tangible impact of JRC activities in 2016

Selected examples of tangible impact of JRC activities, related to the Commission General Objectives 1, 3, 4 and 9, listed in Part 1 as well as described in the first part of the current annex			
Commission General Objective No	**Title**	**Description of the impact**	**Category of the impact[26]**
1	Smart specialisation for regional economic transformation	The incorporation of smart specialisation in national and regional innovation strategies aims at a better use of EU regional funds and at a more effective uptake of innovation challenges in European territories. JRC's Smart Specialisation Strategy (S3) Platform acts as a facilitator for regions and countries in the uptake and incorporation of the smart specialisation concept and methodology in their research and innovation strategies (RIS3). It has contributed to the on-going change in the way innovation policies are dealt with in European regions and the monitoring mechanisms of S3, evolving into a "hub" for the implementation of RIS3 across European territories. JRC has authored a handbook on implementing Smart Specialisation Strategies and contributed to a report of the United Nations Economic and Social Commission for Asia and the Pacific (ESCAP) on "Smart specialisation for regional economic transformation" (Asia-Pacific Tech Monitor Vol. 32 No. 3). The S3 Platform is mentioned in many policy documents on the subject, like European Parliament resolution of 13 September 2016 on Cohesion Policy and Research and Innovation Strategies for Smart Specialisation (RIS3) (2015/2278(INI)), CoR Guide on Regional Innovation Ecosystems - Europa or CoR 13th SEDEC Commission DRAFT OPINION: Smart Specialisation Strategies (RIS3): impact for regions and inter-regional cooperation.	Support to specific countries/regions and international bodies (other than standardisation or crisis support)

[26] JRC classification: 1) Anticipation, conception, adoption of EU policy; 2) Implementation, monitoring, evaluation of EU policy; 3) Ad-hoc support (including crisis management); 4) EU and global standardisation and international harmonisation; 5) Support to specific countries/regions and international bodies (other than standardisation or crisis support).

1	Research and Innovation Observatory (RIO) and its Policy Support Facility (PSF) for MS learning	The RIO- Policy Support Facility (PSF) has become a key source of policy information, including within the framework of the European Semester. The newly created PSF section contains country peer reviews, specific support and mutual learning exercises for which the RIO-PSF webpage is the only source where information is published and stored to support and analyse longer-term trends. The website is referred to as a key source of information with regards to country-based information, i.e. the country analysis and the R&I country specific recommendations (CSRs) in e.g. the note by the Presidency in view of the meeting of the High Level Working Group on Competitiveness and Growth on 4 July 2016, on the European Semester: thematic discussion on best practice for removing national barriers on the Single Market (European Council document 10497/16, 28 June 2016) and SWD(2016) 85 final, used to feed in the discussions in the European Council - document 6607/16, 1 March 2016.	Implementation, monitoring, evaluation of EU policy
1	Implementing the EU Urban Agenda: the Urban Data Platform as key knowledge source for Europe's cities	The Urban Data Platform (UDP) addresses one of the Urban Agenda for the EU pillars, namely better knowledge and data. The UDP was launched together with the EC/UN-Habitat Report on 'The State of European Cities 2016' and provides easy access to data and indicators in the Report, most of which are coming from JRC. The UDP is further referred to as the contribution of the European Commission the new global Urban Agenda adopted during the UN-Habitat III conference in Quito. The UDP is also the primary source of knowledge on European cities in the 'topic page' (one-stop-shop) of the European Commission.	Implementation, monitoring, evaluation of EU policy
1	Contribution to "A New Skills Agenda for Europe: Working together to strengthen human capital, employability and competitiveness" - Commission Communication, COM(2016) 381 final	Digital skills or competences, as well as entrepreneurial skills are key topics described in the SKILLS Communication, to improve the quality and relevance of skills formation in Europe (Chapter 1 of the COM(2016) 381 final). The Communication mentions that "the Commission has developed reference frameworks for digital competences (now taken up in 13 Member States) and entrepreneurship - newly published", referring to JRC projects. The digital competence frameworks and a section on entrepreneurial skills referring to JRC studies are also included in SWD(2016) 195 final (PART 1/4), "Analytical underpinning for a New Skills Agenda for Europe", accompanying the SKILLS Communication. Aim of these competence frameworks is to define and describe the main competences involved in order to create a common language and understanding at European level, similar to for instance, the language levels framework (A-B-C).	Anticipation, conception, adoption of EU policy
1	Contribution to drafting the 2016 Employment and Social Developments in Europe (ESDE) Report	The Employment and Social Developments in Europe (ESDE) review is an annual review of the latest employment and social trends underpinning EU and MS policy actions in pursuit of the Europe 2020 employment and social goals. It is a flagship publication of DG EMPL that sheds light on the impact of previous social and employment policies, but also sets markers for future actions. JRC supported drafting the report; Chapter 4 of the report refers to research undertaken in JRC in the area of digitalisation, labour, the collaborative economy, digital competences, entrepreneurship and skills and Chapter 3 refers to JRC research on labour markets and migrants.	Implementation, monitoring, evaluation of EU policy
3	Support to the "Winter Package" – COM(2016)767 updating the Renewable Energy Directive	EU legislation fixes a minimum requirement for greenhouse gas (GHG) savings for biofuels and solid/gaseous biomass. JRC contributed to COM(2016)767 updating the Renewable Energy Directive (Annex V and VI). The "default" and "typical" values in Annex V and VI of COM(2016)767 on updating the Renewable Energy Directive attributing GHG savings to all the most important and commercially available biofuels and bioenergy pathways, and thus determining their eligibility to financial support and incentives, are calculated by the JRC.	Anticipation, conception, adoption of EU policy

3	Support to the Baltic States and Finland in the development of a regional Risk Assessment for their gas system	JRC has contributed to improvement in the quality of the studies performed in line with the non-mandatory regional approach encouraged by Regulation 994/2010 on security of gas supply. Sharing this work with other MS in the Gas Coordination Group may be of much help to disseminate to other regions the methods used and the regional approach. The JRC upgraded the existing hydraulic model for the Baltic countries and Finland, designed questionnaires for experts, developed hydraulic computations and estimated probabilities from available statistics and data. This is the first time a hydraulic model integrating the four countries can be used to do estimations of impacts of gas crisis scenarios, giving a more comprehensive view of the risk affecting the gas systems. It has also provided the countries involved a possibility to learn new methods to estimate probabilities of scenarios.	Support to specific countries/regions and international bodies (other than standardisation or crisis support)
3	LULUCF 2030 - LULUCF contribution to the 2030 EU climate and energy policy	The legislation to include the land use sector in 2030 EU climate and energy policy (479/2016) is a fundamental step to implement the EU climate policy. The JRC supported DG CLIMA on: (i) the implementation of the EU LULUCF (Land Use, Land Use Change and Forestry) Decision 529/2013 and (ii) defining the main elements and the data analysis of the Impact Assessment (SWD(2016) 249 final) associated to the legislative proposal on the inclusion of the land use sector in the 2030 EU climate and energy policy (479/2016).	Anticipation, conception, adoption of EU policy
3	Report on energy consumption trends 2005-2014	The JRC has been monitoring EU and MS's energy consumption trends for a number of years. A report is prepared every two years. It analyses the energy savings achieved and links them to the EU energy efficiency policies adopted. It also assesses the effectiveness of polices that have a large impact on society, due to the economic savings for citizens, the reduction in global CO_2 emissions and of local pollution. The data and indicators identified and analysed by the JRC are used by DG ENER for a number of policy reports on energy efficiency and generally to monitor the EU and MS progress toward the 2020 energy efficiency targets. The 2016 edition (with energy data for the period 2005-2014) was used for the revision of the Energy Efficiency Directive in the 2016 Energy Winter Package.	Implementation, monitoring, evaluation of EU policy
3	Operation of the Euratom On-Site Laboratories at La Hague (F) and Sellafield (UK)	The two commercial reprocessing plants of spent fuel from power reactors process around 2000 tonnes of nuclear material per year. Under the Euratom Treaty, the EC has the duty to assure that nuclear material is only used for declared purposes. Key to provide precise control of the large flows of nuclear material is the analysis of samples taken at various key measuring points independently of the facility operator. The on-site laboratories offer the Euratom safeguards inspectors independent analytical capacity of high quality and provide results within a short time. Typically some 700 – 900 samples from the input solution, the process flow, and Pu products are analysed annually by radiometric, chemical and mass spectrometric methods. The laboratories also provide technical assistance to the Euratom inspectors and do non-routine measurements when requested. The on-site laboratories contribute to the assurance that the legal duties under the Euratom Treaty and their commitments to the Non-Proliferation Treaty are complied with.	Implementation, monitoring, evaluation of EU policy

4	Fingerprinting nuclear waste and four interlaboratory comparisons to increase confidence in recycled steel	Dismantling a nuclear power plant, a majority of the metals have so low activity that they can be recycled. To enable this while maintaining radiation safety, free release measurement facilities are developed. The JRC developed calibration standards that enable radionuclide specific characterisation of waste (Council Directive 2013/59/EURATOM). They have been used by several companies to calibrate and validate their radioactivity measurement systems e.g., NUVIA SA together with the CMI (Czech Metrological institute) and 5 steel mills are now using them. Several national metrology institutes also used the interlaboratory comparisons to prove and improve their measurement capabilities for metallurgical samples. Improved measurement capability reduces the risks of irradiation in the industry and for population. This work supports national regulatory bodies and international institutions and committees competent in ionisation radiation measurements.	EU and global standardisation and international harmonisation
4	Commission implementing decisions establishing best available techniques (BAT) conclusions, under Directive 2010/75/EU, for common waste water and waste gas treatment/ management systems in the chemical sector and for the non-ferrous metals industries	The JRC work on best available techniques (BAT) reference documents has resulted in two Commission implementing decisions ((EU) 2016/1032 and (EU) 2016/902) on establishing BAT. These BAT conclusions set the mandatory common environmental standards for the EU chemical industry with respect to emissions to water and for the EU non-ferrous metals industries. Member States competent authorities must use the BAT conclusions to set or to update permit conditions and ensure compliance with the Industrial Emissions Directive (IED).	Implementation, monitoring, evaluation of EU policy
4	Harmonisation practices for the complete denaturing of alcohol across the EU	Making excise duty exemptions from alcohol taxation less vulnerable to fraud, evasion or avoidance was a priority by proposing a safer and easier denaturing system. With the adoption of Commission Implementing Regulation (EU) 2016/1867 and its implementation in 2017, a milestone was achieved. The new rules introduced a single method for the complete denaturing of alcohol in the EU and removed all the remaining national Completely Denatured Alcohol (CDA) formulations from the Annex to the Regulation (EU) No 162/2013. The JRC coordinated in collaboration with DG TAXUD a *Fiscalis* group of experts and contributed to identifying most appropriate denaturants and developing and validating a Standard Operating Procedure to measure the concentrations of the denaturants and ethanol in the Euro formulation for CDA.	Anticipation, conception, adoption of EU policy
9	Support to EU Conflict Early Warning System - autumn 2016 prioritisation	The EU Conflict Early Warning System (EWS) is a tool for EU decision-makers to manage risk factors and prioritise resources accordingly. The EWS enables staff across the EU to identify and communicate where they see long-term risks for violent conflict and/or deterioration in a country or region and to stimulate early preventive actions to address those risks. The first step in the process scans for high risk and deteriorating situations globally using a quantitative index developed by the JRC: the Global Conflict Risk Index (GCRI). In 2015, the GCRI has been adopted as the initial input for the EU Conflict Early Warning process, run by the External Action Service, and feeding in the Political and Security Committee (PSC) as an EU risk assessment delivered to the Member States. In 2016, the GCRI was formalised in a Joint Staff Working Document (SWD(2016) 3 final). The GCRI also contributed for the fifth time to the PSC in November 2016.	Implementation, monitoring, evaluation of EU policy

9	Support to the European Emergency Response Coordination Centre (ERCC)	JRC has developed a prototype Global Drought Observatory (GDO) for continuous monitoring of drought situations and their potential impacts across the entire globe. The information provided through the GDO as well as the ad-hoc reports supported the decision-making process for deploying humanitarian aid and help in the coordination of field missions and in the evaluation of the disaster impact on vulnerable societies. GDO is a tool to be used in operational circumstances of the European Emergency Response Coordination Centre at DG ECHO.	Ad-hoc support (including crisis management)
9	Strengthening EU Member States nuclear security by JRC expertise support and training through EUSECTRA	EUSECTRA nuclear security training is part of JRC's nuclear counter-terrorism and nuclear non-proliferation portfolio. Since its official launch, EUSECTRA has hosted trainees from over 70 different countries (including all 28 MS) which have benefited from the training and expertise provided. EUSECTRA trainings are repeatedly acknowledged by trained countries to be beneficial in terms of enhancing preparedness, detection of and response to nuclear security events. It helps to improve Member States capabilities to address the threats associated with illicit incidents involving nuclear or other radioactive materials by providing hands-on training using real nuclear materials to front line officers, their management, trainers and other experts in the field. Based on the unique combination of scientific expertise, specific technical infrastructure and availability of a wide range of nuclear materials, EUSECTRA complements national training efforts by providing realistic scenarios with real special nuclear material. EUSECTRA is one of the few places in the world where a wide range of samples of plutonium and uranium of different isotopic compositions can be used for training in detection, categorisation and characterisation.	Support to specific countries/regions and international bodies (other than standardisation or crisis support)
9	Developing a global people-based definition of cities and settlements	The JRC produced in 2016 the most complete, consistent, global, free and open data set on human settlements. The data set provides new insights in global urbanisation over the past 40 years. The data allowed for the first time to apply the Eurostat definition of cities and rural areas to all settlements of the world; according to this definition the world is much more urbanised than previously estimated. These and other key findings were summarised in the DG REGIO and UN HABITAT Report "Atlas of the Human Planet 2016" and in the first chapter of the "State of the European Cities".	Implementation, monitoring, evaluation of EU policy
9	Support to recast and implementation of the Strategic Export Control policy	EU trade of dual-use goods is ruled by EC Regulation 428/2009 which the Commission has proposed to recast in 2016. JRC has supported DG TRADE in this process by executing background studies, providing direct legal inputs and a thorough list of comments to the first proposal which were taken into account to prepare the draft accepted by Commission decision on 28 September 2016. The technical and legal support provided by JRC to DG TRADE in relevant EU committees on dual-use goods and in the International regimes facilitates the harmonised implementation of export controls in the EU and a level playing field for exporters. JRC also contributes to the harmonised implementation of technical controls by Member States through running and contributing to the EU Pool of Experts on dual-use goods since 2012 and helping the drafting of guidelines for harmonised implementation of export controls. Furthermore, the JRC analyses the technical updates decided by the Nuclear Suppliers Group and Australia Group (chemical and biological controls) international export control regimes, submitting the results to DG TRADE and the Council Working Party on Dual-Use Goods assembling the EU-28 representatives. The JRC supports also part of the amendment to the Dual-use regulation Annex I, i.e. the EU dual-use control list and is recognised by the Member states as a peer-practitioner. This has been recognised by the attribution by the Council Working Party on Dual Use goods of the Coordinating role for the drafting of the technical annexes of the new revised sanctions measures targeting the Democratic People's Republic of Korea (DPRK) and Iran.	Implementation, monitoring, evaluation of EU policy

Selected examples of tangible impact of JRC activities related to the General Commission Objectives 2, 5 and 8 and described in the first part of the present annex			
2	Contribution to the Digital Single Market policy package: geo-blocking	The JRC contributed to COM(2016) 289 final, "Proposal for a regulation on addressing geo-blocking and other forms of discrimination based on customers' nationality, place of residence or place of establishment within the internal market" and its accompanying impact assessment SWD(2016) 173 final. JRC's economic estimates provided crucial evidence in support of the policy proposal and enabled DG CNECT to get approval of its impact assessment and defend its proposal in the Council and Parliament.	Anticipation, conception, adoption of EU policy
2	Preparation of the Implementing Regulation (EU) No 799/2016, from technical choices to MS endorsement at Road Transport Committee	The new regulation provides the technical requirements for the construction, testing, installation, operation and repair of new generation of digital tachographs, called smart tachographs, which will become mandatory in the field for new plated trucks in 2019. The Regulation consists of more than 500 pages of requirements and technical specifications and is the result of a long-standing JRC effort. In preparing this Regulation, the JRC provided independent scientific/technical expertise, securing the final objective of delivering a consensus text reflecting the common interest and the needs of the different stakeholders involved, namely the industry (i.e., vehicles, tachographs and smart-cards manufacturers), the national authorities (i.e., card issuing, workshops supervision and road police authorities), and the final users (i.e., road transport drivers and transportation companies). JRC supported directly DG MOVE in the negotiation process with the Member States and participated in three Road Transport Committees, where the new specifications were explained, defended and eventually endorsed by the Member States.	Anticipation, conception, adoption of EU policy
2	Towards a European ICT security certification framework for products and services supporting the Digital Single Market	JRC work on Industrial and Automation Control Systems has resulted in a 4-level certification scheme which serves as a pilot to be implemented across the IT industry. Commission communication 'Strengthening Europe's Cyber Resilience System and Fostering a Competitive and Innovative Cybersecurity Industry' (COM(2016) 410 final) refers to the work of the JRC, and it is also mentioned in the roadmap towards a European ICT security certification for products and services. By improving the security of Industrial and Automation Control Systems (IACS) JRC contributes to the improvement and security of critical infrastructures in Europe. The development of this certification scheme will also strongly contribute to the establishment of the digital single market.	Anticipation, conception, adoption of EU policy
2	Contribution to EC Staff Working Document - Impact Assessment accompanying Proposals for Directive of the EP and the Council establishing the European Electronic Communications Code (Recast), and a Regulation establishing the Body of European Regulators	The impact assessment accompanying the proposals for a Directive (COM(2016)590) and a Regulation (COM(2016)591) builds on JRC modelling work and a technical report "A CGE Model with ICT and R&D-driven Endogenous Growth: A Detailed Model Description". This impact assessment aims at gathering inputs to assess the current rules and develop ways to adapt to the framework in light of market and technological developments, with the objective of contributing to the Digital Single Market Strategy.	Anticipation, conception, adoption of EU policy

5	Contributions to ECFIN official reports	JRC's economic modelling results and estimations have contributed to several DG ECFIN official reports: "European Economic Forecasts" Spring 2016 and Autumn 2016 (Institutional Papers 025 and 038): Public Finance EMU Report 2016", Institutional Paper 045, December 2016; "VadeMecum on the Stability and Growth Pact", Institutional Paper 021 - March 2016; "European Economic Forecasts" Spring 2016 and Autumn 2016 (Institutional Papers 025 and 038); "Public Finance EMU Report 2016", Institutional Paper 045, December 2016; and "VadeMecum on the Stability and Growth Pact", Institutional Paper 021 - March 2016.	Implementation, monitoring, evaluation of EU policy
5	Contribution to the Action Plan on Building Capital Market Union	The JRC contributed to the "European Financial Stability and Integration Review" SWD(2016)146 final (DG FISMA). JRC analyses contributed to showing that there is still heterogeneity in EU financial markets and that the sovereign strength has a role in several dimensions. For instance, JRC analyses showed that the impact of financial shocks during the EU sovereign crisis was very different across the Member States. Some of them suffered the sovereign crisis in a stronger way than others (e.g. Eastern countries) which were mostly dominated by local influences. The analysis of financial markets integration also demonstrated that Euro area distressed countries present lower integration than euro area core countries, with the largest gaps appearing in 2002-2004 for Ireland and Greece.	Anticipation, conception, adoption of EU policy
5	Contribution to Impact Assessment of Capital Requirements Regulation Review proposal	The JRC work allowed DG FISMA to include a quantitative estimation of the benefit of the policy measure in the impact assessment (SWD(2016) 377 final/2), and to compare it with previous policy interventions (already assessed by JRC using similar methodologies). DG FISMA reputes that the inclusion of the quantitative analysis was instrumental in passing the exam of the Impact Assessment Board.	Anticipation, conception, adoption of EU policy
5	Contributions to SWD(2016) 341 final Impact Assessment Accompanying the document Proposals for a Council Directive (COM(2016) 683 final) on a Common Corporate Tax Base and a Common Consolidated Corporate Tax Base	Harmonisation of corporate tax bases enables to fight tax avoidance and promote transparency of corporate tax systems, in particular with reference to large multinationals. JRC carried out simulations of alternative policy proposal scenarios regarding definition of common corporate tax base in the UE, including consolidation of corporate accounts throughout the EU and policy proposal to foster growth, investment and innovation. These were included in the SWD(2016) 341 final Impact Assessment Accompanying the document Proposals for a Council Directive (COM(2016) 683 final) on a Common Corporate Tax Base and a Common Consolidated Corporate Tax Base.	Anticipation, conception, adoption of EU policy

Other examples of tangible impacts related to General Commission Objectives 1, 3, 4, 7, 8 and 9			
1	UNECE Executive Body for the Convention on Long-range Transboundary Air Pollution - guidance on nitrogen budgets	UNECE (United Nations Economic Commission for Europe) has issued the "Guidance Document on National Nitrogen Budgets" of which the JRC has prepared the annex 8 on hydrosphere. This is a contribution to international harmonisation of nitrogen budgeting under the Convention on Long-Range Transboundary Air Pollution (CLRTAP).	EU and global standardisation and international harmonisation
1	Enabling the replacement of animal testing for skin corrosion/irritation and serious eye damage/eye irritation in European chemicals legislation	Article 13(2) of the European Union's chemicals legislation (Regulation No. 1907/2006, REACH) requires the Commission to regularly review and improve the provisions of the legislation with a view to replace, reduce or refine animal testing. So far, the Standard Information Requirements (SIR) for skin corrosion/irritation and serious eye damage/eye irritation in REACH Annex VIII have been animal (in vivo) tests. However, under JRC leadership, significant progress has been made in recent years in the validation and regulatory acceptance of alternative test methods for these regulatory human health endpoints. JRC provided upon request of DG GROW and ENV scientific advice on the feasibility of replacing in vivo testing for skin corrosion/irritation and serious eye damage/eye irritation with non-animal (in vitro) methods and assessed the impact of a potential revision of the wording in the REACH Annexes to make in vitro testing the single SIR for these endpoints. The REACH Committee approved the update of Annexes VII and VIII of the REACH Regulation as proposed by DGs ENV & GROW. The update was published in Commission Regulation (EU) 2016/863.	Anticipation, conception, adoption of EU policy
1	Utilisation of JRC-EUROCAT database for ad hoc support to ECDC's surveillance protocol for a potential Zika virus outbreak in Europe	JRC activities contributed directly to the implementation of Decision No 1082/2013/EU of the European Parliament and of the Council on serious cross-border threats to health and repealing Decision No 2119/98/EC. The JRC-EUROCAT database was used for *ad hoc* support to the European Centre for Disease Prevention and Control (ECDC) in preparing the necessary steps to be taken in case of a Zika virus epidemic in Europe. Although the JRC-EUROCAT database was not originally designed for crisis purposes it includes data useful also in this respect, covering over 1/3rd of European births. The scientific journal Nature (editorial of 05 July 2016) considered EUROCAT as 'one of the most developed surveillance systems for birth defects'.	Ad-hoc support (including crisis management)
1	Prevalence on the European Union market of honey adulteration with exogenous sugars	The European Commission has regularly been informed of the presence on the market, in a potentially significant proportion, of honey that may not meet the composition criteria laid down by Directive 2001/110/EC and/or that is not the result of the production process required by the legal definition of honey. In 2015 DG SANTE launched a coordinated control plan on authenticity of honey where JRC assisted by performing analyses to detect honey adulteration with exogenous sugars using a technique rarely available in the Member States (Commission Recommendation C(2015) 1558 final). The tests performed by a EA/LC-IRMS indicated that 14.2% of the 893 honeys analysed were found suspicious of containing added sugar syrups according to the purity criteria for genuine honey published by Elflein and Raezke in 2008. To improve the reliability of the techniques used to determine the authenticity of honey, a number of recommendations were listed which are directed to different decision makers.	Implementation, monitoring, evaluation of EU policy

3	SyRIO — System for Reporting the Incidents in Offshore Oil and Gas Operations	Member States are required to ensure that operators of offshore oil and gas installations provide the Competent Authority with the data on major hazard indicators as specified in Directive 2013/30/EU. This information should also demonstrate the overall effectiveness of measures and controls implemented by the operators to prevent major accidents and minimise risks to the environment. The information and data provided should ensure that the performance of individual operators can be compared within the Member State and the performance of the industry as a whole can be compared between Member States. The sharing of comparable data is difficult due to the lack of a common data reporting format across all Member States. To overcome this, Implementing Regulation (EU) No 1112/2014 was issued to establish a common format for the reporting of data by operators to Member States and by Member States to the Commission. The JRC has conceived and implemented SyRIO to facilitate the reporting of incidents and major accidents from operators to Competent Authorities. SyRIO follows exactly the template provided in the Implementing Regulation thus facilitating the work of operators and owners of offshore installations for their reporting to Competent Authorities. SyRIO facilitates the EU-wide harmonisation of the format for the reporting of accidents, thus leading to further improvements in the safety levels in the EU offshore oil and gas industry. In the future, the software could also be used by the Competent Authorities of third countries having offshore oil and gas activities within their jurisdiction. Commission Decision (2016/C 420/02) has authorised the free software licensing (European Union Public License) of SyRIO.	Implementation, monitoring, evaluation of EU policy
4	Development of the Regulation (EU) No. 2016/427 amending Regulation (EC) No 692/2008 as regards emissions from light passenger and commercial vehicles (Euro 6)- 1st RDE package	The data generated by the JRC have contributed to the selection of specific technical options in the test procedure. As an example, the JRC data have shown as the on-road tests with portable systems are more robust than laboratory based tests with random cycles in terms of transparency and in preventing from potential use of defeat devices. The data evaluation tool (EMROAD) developed by the JRC has been also considered by several parties as the most transparent and robust system to process the emission data collected on the road. The JRC work is a contribution to the Regulation (EU) No. 2016/427 amending Regulation (EC) No 692/2008 as regards emissions from light passenger and commercial vehicles (Euro 6) - 1st RDE package.	Anticipation, conception, adoption of EU policy
4	Development of the Regulation (EU)2016/1628 on requirements relating to gaseous and particulate pollutant emission limits and type-approval for non-road mobile machinery (NRMM) amending and repealing Directive 97/68/EC- NRMM STAGE V regulation	JRC contributed to development of Regulation (EU) 2016/1628 on requirements relating to gaseous and particulate pollutant emission limits and type-approval for non-road mobile machinery (NRMM). The legislation defines engine categories, which are divided into sub-categories according to their power range. For each category, it sets emission limits for CO, HC, NOX and particulate matter (PM) and deadlines for implementing them, starting from 2018. Compared to the existing directive, the legislation covers more types of engines, simplifies administrative procedures and improves enforcement and market surveillance. The plans include a new in-service engine performance monitoring system which should close the current gap between laboratory emission test figures and those measured in the real world.	Anticipation, conception, adoption of EU policy

4	Development of a testing procedure to demonstrate the durability of replacement pollution control devices - Commission Regulation (EU) 2016/1718 concerning emissions from heavy-duty vehicles	Before being put on the market, replacement pollution control devices have to be type approved and their capability to meet the durability requirements have to be demonstrated. The JRC initially adapted to the EU regulatory context a methodology developed by Southwest Research Institute for the aging of after-treatment devices of heavy duty vehicles. The adaptation consisted in identifying a suitable reference cycle to derive the thermal load to be reproduced in the aging cycle and then the development of the aging cycle. Later, based on the methodology modified by JRC, JRC together with DG-GROW wrote the test procedure described in Appendix 3 of Commission Regulation (EU) 2016/1718 amending Regulation (EU) No 582/2011 with respect to emissions from heavy-duty vehicles as regards the provisions on testing by means of portable emission measurement systems (PEMS) and the procedure for the testing of the durability of replacement pollution control devices. The new test procedure will guarantee that after-treatment devices that can be purchased on the market to replace the original system have a high quality standard and are durable. This will also ensure that pollutant emission levels from engines will not increase when fitted with replacement pollution control devices with obvious benefits for air quality, especially considering that heavy duty vehicles have a long useful life in terms of mileage. Moreover, the new test procedure is based on an accelerated aging methodology and is designed to demonstrate the durability of after-treatment devices in a shorter time compared to the durability requirements. This will reduce the testing costs for the manufacturers.	Anticipation, conception, adoption of EU policy
4	Scientific Support to DG EMPL on Occupational Safety and Health (OSH)	In 2016, DG EMPL implemented the Commission Decision 2014/113/EU setting new operation rules for the Scientific Committee for Occupational Exposure Limit (SCOEL) and aligning SCOEL's functioning with the Commission's rules on expert groups. JRC operates directly with the SCOEL Secretariat developing the OELs. JRC developed a standard technique to carry out literature surveys in a harmonised, robust, transparent, and reproducible way. JRC produces Scoping Reviews, summarizing in a document, the entire relevant scientific information for a given hazardous chemical. These reviews are provided to SCOEL, so it can propose OELs. JRC has the lead in drafting specific chapters of the Recommendations, including classification, occurrence, production, uses, monitoring, occupational exposures and existing OELs. During 2016, 11 SCOEL recommendations and opinions were published by the Commission which included JRC contributions.	Implementation, monitoring, evaluation of EU policy
4	Support to evidence-based EU policy decision on tattoo safety	The EC launched the project "Tattoos - Permanent Make-up" with the aim of collecting data about the use, the ingredients, the EU market and the possible health problems associated to tattoos and PMU inks. The JRC has been entrusted by DG JUST to provide sound evidence regarding the use, the ingredients, the EU market and the possible health problems associated to tattoo and permanent make-up. Currently, without a specific EU legislative measure, some Member States have adopted their own national legislation, others have prepared draft regulations. MS have asked for an EU harmonised action on tattoos and PMU inks to ensure better consumer protection and facilitate free movements of goods in the internal market. The comprehensive work of the JRC has provided our partner DG JUST with a solid basis for the on-going internal policymaking discussion. On that basis, in December 2015, the Commission requested ECHA to prepare a proposal for an Annex XV dossier for restriction of certain substances used in tattoo inks including substances with CMR harmonized classification and skin sensitizers.	Anticipation, conception, adoption of EU policy

7	Enabling EC inspections of explosive trace detection equipment in EU airports	Explosives trace detection (ETD), normally based on ion-mobility spectrometry (IMS), is a category of equipment whose use in EU airports became mandatory as of September 2015. Consequently, ETD equipment is now included in the list of equipment that should be checked for regulatory compliance by aviation inspectors, including the Commission's own inspectors. JRC was able to provide a test kit, testing protocol, and training to the EC inspectors in a timely manner, so that they were able to inspect ETD equipment already during their first inspections following the September 2015 deadline. The test kit enables the inspectors to take a decision, with the necessary confidence and scientific robustness, on whether or not a piece of ETD equipment is performing satisfactorily or not. We have already seen cases where the test kit has identified ETD equipment that was in need of servicing/maintenance. Hence, the test kit is enabling the inspectors i) to fulfil their legal mandate, and ii) contributing to better security.	Implementation, monitoring, evaluation of EU policy
8	From an AFIS for SIS to new biometric modalities and processes	JRC contributed to the Commission Report COM(2016) 93 final on "The availability and readiness of technology to identify a person on the basis of fingerprints held in the second generation Schengen Information System (SIS II)". The proposal of the Commission for revising SIS Regulation includes the three recommendations made by the JRC for improving SIS: the possibility to store latent with a new type of alert, the use of face recognition and palm print algorithm. In the light of the analysis and observations of the JRC, the Commission concludes that AFIS technology has reached sufficient levels of readiness and availability to be integrated in SIS.	Anticipation, conception, adoption of EU policy
9	Capacity building for chemical accident prevention in the EU and globally	As a contribution to the EC initiative "Seveso Capacity Building in EU Neighbour Countries" the JRC initiated bilateral collaboration with Moldova, Israel and Georgia, who are all in the process of aligning their chemical accident prevention and preparedness with the Seveso Directive. This way these countries obtained access to JRC expertise on consequence and risk assessment and to Member State experience in establishing government implementing programmes. These efforts also help lifting roadblocks on certain issues, for example on giving Moldova specific advice from Romania on how to develop coordinating mechanisms between authorities, and on giving Georgia the path to establishing a scientific basis for emergency planning associated with major chemical hazard sites. Over time, also the Member States benefit of e.g., creating a new safety culture in the neighbour countries.	Support to specific countries/regions and international bodies (other than standardisation or crisis support)
9	Expert to the monitoring team on the resumption of rough diamond trade in the Central African Republic	The JRC is one of the experts in the team assessing whether zones and shipments can be declared compliant in line with the minimum Kimberley Process requirements and based on available and sufficient documentation. The analyses of the JRC contribute to a balanced decision by the Central African Republic monitoring team, the authority mandated by the Kimberley Process Plenary, taking into account both the urgent need for resources and possible threats for the integrity of the Kimberley Process itself. In 2016 four zones have been declared compliant.	Support to specific countries/regions and international bodies (other than standardisation or crisis support)