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In 2015, total expenditure on Research and Development amounted to €71.5 million, or 0.77 per cent of GDP.

Research and Development in Malta: 2013-2015

R&D Expenditure

During 2015, an increase in total expenditure on R&D activities was registered by €11.0 million equivalent to 18.1 per cent from 2014. The Business Enterprise sector contributed 51.4 per cent to total R&D, whereas the Higher Education and Government sectors contributed 32.1 and 16.5 per cent respectively (Table 1).

Predominantly the R&D expenditure is dedicated to Basic Research, with a 67.2 per cent of total R&D in 2015, followed by Applied Research (23.5 per cent) and Experimental Development (9.3 per cent). Refer to methodological note 3 for the definition of each type of R&D activity (Table 2).

The added R&D expenditure was triggered by higher outlays on capital expenditure of €9.8 million, mainly as a result of higher capital costs in the Government and Business Enterprise sectors. Outlays on recurrent expenditure increased only by €1.2 million or 2.4 per cent. Labour costs represented 54.9 per cent of total expenditure, whereas other recurrent expenditure and capital projects had a share of 16.3 per cent and 28.8 per cent respectively (Table 3).

In 2015, the highest rate of R&D activity was recorded in Engineering and Technology which accounted for 34.5 per cent of total expenditure, followed by Medical Sciences (24.4 per cent) and Natural Sciences (20.4 per cent). Year-on-year comparisons show that the highest increase was registered in Medical Science by €5.1 million. Conversely, Natural Sciences went down by €0.04 million.

The majority of R&D activity in Engineering and Technology and Natural Sciences was undertaken in business enterprises whereas research in relation to Medical and Social Sciences was mainly carried out by the Higher Education sector (Table 4).

Each sector mostly funds its own research, supplemented by foreign funds, mainly foreign business enterprise funds for the Business Enterprise sector, general university funds for the Higher Education sector and EU funds for the Government sector. Foreign funds for R&D reached €14.6 million, or 20.4 per cent of total funds (Table 5).

R&D Employment

In 2015, 2,375 employees were engaged in R&D work, of who 1,484 dedicated part of their time to R&D. The highest R&D employment rate was registered in the Higher Education sector, at 1,277 employees, followed by the Business Enterprise sector, with 1,026 employees. Male employment was predominant among researchers and technicians (Table 6).

As regards employment by major field of science, in 2015 the highest employment activity in R&D was recorded in Engineering and Technology with 662 employees, followed by Natural Sciences and Social Sciences, with 624 and 396 employees respectively (Table 7).

GBARD

In 2016, the highest outlays of Government budget allocations for R&D (GBARD) were recorded in the socio-economic activities related to Health (€4.6 million), Industrial Production and Technology (€4.1 million) and Culture, recreation, religion and media (€4.0 million) (Table 8) ■

Compiled by: **Public Finance Unit**
Contact us: **National Statistics Office, Lascaris, Valletta VLT 2000**
T. +356 25997219, E. nso@gov.mt

Table 1. Total R&D Expenditure as a % of GDP*

€000s

	2013	2014	2015
Government Sector (GOV)	5,628	6,042	11,803
Business Enterprise Sector (BES)	30,544	33,460	36,729
Higher Education Sector (HES)	22,883	21,037	22,960
Total R&D expenditure	**59,055**	**60,539**	**71,491**
% of GDP*	**0.77**	**0.72**	**0.77**

* Source: Gross Domestic Product as published in News Release No. 093/2017
Note: Totals may not add up due to rounding

R&D Expenditure by sector of performance

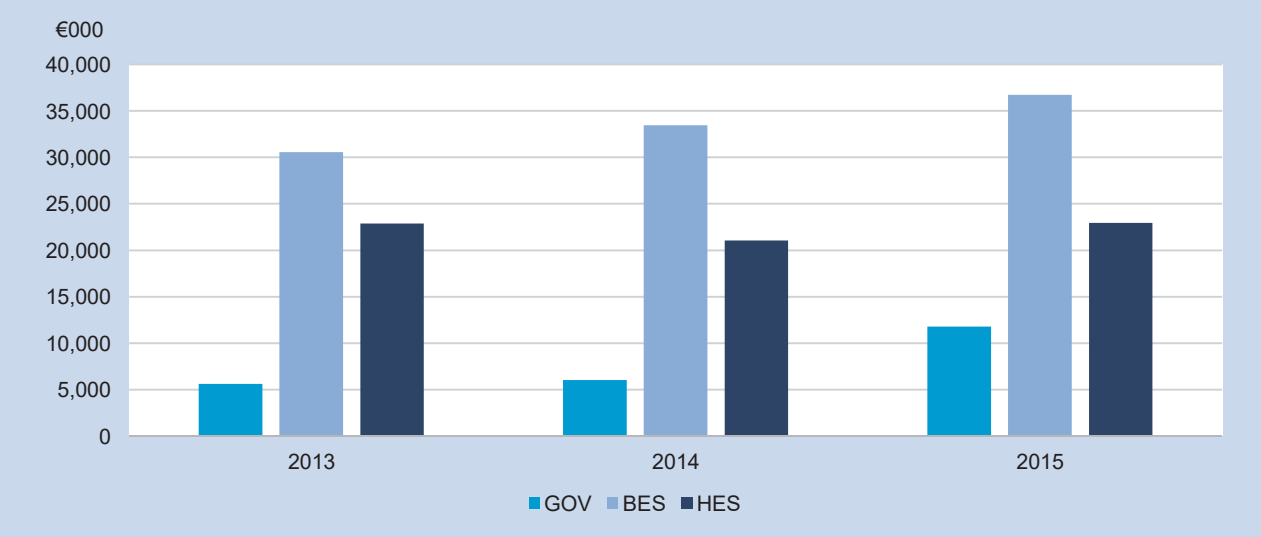

Table 2. Total expenditure on R&D by type of activity

€000s

	GOV	BES	HES	Total
	2013			
Basic Research	4,789	13,030	22,843	**40,662**
Applied Research	764	11,958	40	**12,762**
Experimental Development	75	5,557	0	**5,631**
Total	**5,628**	**30,544**	**22,883**	**59,055**
	2014			
Basic Research	5,263	13,850	20,942	**40,055**
Applied Research	744	13,600	95	**14,440**
Experimental Development	35	6,010	0	**6,045**
Total	**6,042**	**33,460**	**21,037**	**60,539**
	2015			
Basic Research	11,249	13,938	22,862	**48,048**
Applied Research	554	16,131	98	**16,783**
Experimental Development	0	6,660	0	**6,660**
Total	**11,803**	**36,729**	**22,960**	**71,491**

Note: Totals may not add up due to rounding

Table 3. Total expenditure on R&D by type of costs

€000s

	GOV	BES	HES	Total
2013				
Recurrent Expenditure	**770**	**27,276**	**16,985**	**45,030**
Labour Costs	449	19,062	13,361	**32,871**
Other Recurrent Expenditure	321	8,214	3,624	**12,159**
Capital Expenditure	**4,858**	**3,269**	**5,898**	**14,025**
Land and Buildings	4,825	1,521	5,318	**11,664**
Instruments and Equipment	33	1,747	581	**2,360**
Total Expenditure	**5,628**	**30,544**	**22,883**	**59,055**
2014				
Recurrent Expenditure	**744**	**30,085**	**18,902**	**49,731**
Labour Costs	465	22,451	15,362	**38,278**
Other Recurrent Expenditure	279	7,634	3,540	**11,453**
Capital Expenditure	**5,299**	**3,375**	**2,136**	**10,809**
Land and Buildings	5,222	1,139	1,643	**8,005**
Instruments and Equipment	76	2,235	492	**2,804**
Total Expenditure	**6,042**	**33,460**	**21,037**	**60,539**
2015				
Recurrent Expenditure	**1,071**	**30,444**	**19,415**	**50,930**
Labour Costs	740	23,080	15,449	**39,269**
Other Recurrent Expenditure	331	7,365	3,966	**11,661**
Capital Expenditure	**10,732**	**6,285**	**3,544**	**20,561**
Land and Buildings	10,487	1,055	1,620	**13,163**
Instruments and Equipment	244	5,229	1,924	**7,398**
Total Expenditure	**11,803**	**36,729**	**22,960**	**71,491**

Note: Totals may not add up due to rounding

Table 4. Total expenditure on R&D by major field of science

€000s

		Natural sciences	Engineering and Technology	Medical sciences	Agricultural sciences	Social sciences	Humanities	Total
Government Sector	**2013**	96	47	4,725	725	35	0	**5,628**
	2014	113	28	5,134	731	35	3	**6,042**
	2015	25	70	8,638	3,044	0	25	**11,803**
Business Enterprise Sector	**2013**	11,312	12,612	4,641	635	419	925	**30,544**
	2014	12,023	17,331	2,675	462	315	653	**33,460**
	2015	11,939	20,118	3,683	322	141	525	**36,729**
Higher Education Sector	**2013**	2,504	4,436	5,046	583	6,516	3,800	**22,883**
	2014	2,499	4,267	4,598	332	5,918	3,422	**21,037**
	2015	2,627	4,454	5,137	366	6,639	3,737	**22,960**
Total	**2013**	**13,912**	**17,095**	**14,412**	**1,943**	**6,969**	**4,725**	**59,055**
	2014	**14,635**	**21,626**	**12,407**	**1,525**	**6,269**	**4,077**	**60,539**
	2015	**14,591**	**24,641**	**17,458**	**3,733**	**6,780**	**4,288**	**71,491**

Table 5. Source of funds of R&D expenditure

€000s

	GOV			BES			HES			Total		
	2013	**2014**	**2015**	**2013**	**2014**	**2015**	**2013**	**2014**	**2015**	**2013**	**2014**	**2015**
Sources of Funds												
Local Funds	**792**	**873**	**2,646**	**23,595**	**28,531**	**33,478**	**20,893**	**18,424**	**20,787**	**45,280**	**47,828**	**56,910**
Business Enterprise	250	250	160	23,162	27,824	32,411	37	52	51	23,449	28,126	32,622
Direct Government	542	623	2,486	346	637	1,066	4,575	1,073	2,419	5,462	2,333	5,971
General University Funds	0	0	0	0	0	0	15,423	16,495	17,488	15,423	16,495	17,488
Others	0	0	0	87	69	1	859	804	829	946	873	830
Foreign Funds	**4,836**	**5,169**	**9,157**	**6,949**	**4,929**	**3,251**	**1,990**	**2,613**	**2,173**	**13,775**	**12,712**	**14,580**
Foreign Business Enterprises	30	0	0	5,727	3,372	1,536	0	0	0	5,757	3,372	1,536
European Commission	4,806	5,169	9,157	1,222	1,307	1,575	1,181	1,594	1,309	7,209	8,070	12,040
Others	0	0	0	0	250	140	809	1,019	864	809	1,269	1,004
Total	**5,628**	**6,042**	**11,803**	**30,544**	**33,460**	**36,729**	**22,883**	**21,037**	**22,960**	**59,055**	**60,539**	**71,491**

Table 6. Total employment in R&D by sex and occupation

	Government Sector			Business Enterprise Sector			Higher Education Sector			Total		
	2013	**2014**	**2015**	**2013**	**2014**	**2015**	**2013**	**2014**	**2015**	**2013**	**2014**	**2015**
Full-time	28	29	29	783	824	807	48	94	55	859	947	891
Males	23	25	27	617	659	655	27	44	28	667	728	710
Females	5	4	2	166	165	152	21	50	27	192	219	181
Part-Time*	19	24	43	240	253	219	1,112	1,087	1,222	1,371	1,364	1,484
Males	15	18	28	182	200	176	653	642	706	850	860	910
Females	4	6	15	58	53	43	459	445	516	521	504	574
Total	**47**	**53**	**72**	**1,023**	**1,077**	**1,026**	**1,160**	**1,181**	**1,277**	**2,230**	**2,311**	**2,375**
Males	38	43	55	799	859	831	680	686	734	1,517	1,588	1,620
Females	9	10	17	224	218	195	480	495	543	713	723	755
Researchers	**25**	**27**	**34**	**552**	**473**	**515**	**806**	**849**	**863**	**1,383**	**1,349**	**1,412**
Males	17	18	25	406	364	407	540	557	577	963	939	1,009
Females	8	9	9	146	109	108	266	292	286	420	410	403
Technicians	**1**	**1**	**3**	**336**	**399**	**300**	**103**	**98**	**121**	**440**	**498**	**424**
Males	1	1	3	303	356	275	83	80	91	387	437	369
Females	0	0	0	33	43	25	20	18	30	53	61	55
Support staff	**21**	**25**	**35**	**135**	**205**	**211**	**251**	**234**	**293**	**407**	**464**	**539**
Males	20	24	27	90	139	149	57	49	66	167	212	242
Females	1	1	8	45	66	62	194	185	227	240	252	297

* Spending a proportion of their working time on R&D activities

Table 7. R&D employment by major field of science

		Natural sciences	Engineering and Technology	Medical sciences	Agricultural sciences	Social sciences	Humanities	Total
Government Sector	**2013**	13	0	0	31	2	1	**47**
	2014	6	7	3	34	2	0	**52**
	2015	1	0	10	60	0	1	**72**
Business Enterprise Sector	**2013**	466	420	29	8	33	67	**1,023**
	2014	515	438	34	6	13	71	**1,077**
	2015	489	411	41	4	14	67	**1,026**
Higher Education Sector	**2013**	122	230	261	33	332	182	**1,160**
	2014	133	242	256	18	345	187	**1,181**
	2015	134	251	280	18	382	212	**1,277**
Total	**2013**	**601**	**650**	**290**	**72**	**367**	**250**	**2,230**
	2014	**654**	**687**	**293**	**58**	**360**	**258**	**2,310**
	2015	**624**	**662**	**331**	**82**	**396**	**280**	**2,375**

Table 8. Government budget allocations for R&D (GBARD)

€000s

Socio-economic objective	**2013**	**2014**	**2015**	**2016**
Exploration and exploitation of the earth	9	0	1	0
Environment	2,032	1,834	2,203	1,908
Exploration and exploitation of space	0	0	0	0
Transport, telecommunication and other infrastructures	0	45	29	76
Energy	65	112	66	57
Industrial production and technology	4,033	3,686	4,946	4,112
Health	4,898	4,305	6,503	4,647
Agriculture	733	748	1,019	571
Education	2,433	2,086	2,397	2,213
Culture, recreation, religion and media	4,299	3,771	4,182	3,954
Political and social systems, structures and processes	3,011	2,580	2,938	2,711
General advancement of knowledge	0	0	0	0
Defence	0	0	0	0
TOTAL	**21,513**	**19,167**	**24,285**	**20,250**

Methodological Notes

1. Research and Development is defined as creative work undertaken on a systematic basis to increase the stock of knowledge, including knowledge of man, culture and society, and the use of this stock of knowledge to devise new applications.

2. R&D is classified in four main sectors:
   - *Government Sector (GOV)* - includes all Government Ministries and Departments, offices and other bodies which furnish, but normally do not sell to the community, those services, other than higher education, which cannot otherwise be conveniently and economically provided, as well as those that administer the state and the economic and social policy of the community.
   - *Business Enterprise Sector (BES)* - includes all firms, organisations and institutions whose primary activity is the market production of goods and services (other than higher education) for sale to the general public at economically significant prices.
   - *Higher Education Sector (HES)* - includes all universities, colleges of technology and other institutions of post-secondary education, whatever their source of finance or legal status.
   - *Private Non-Profit Sector (PNP)* - includes non-market, private non-profit institutions serving households and private individuals or households. This sector is not captured as it is considered to be negligible.

3. R&D covers 3 types of activity:
   - *Basic Research* - refers to experimental or theoretical work undertaken primarily to acquire new knowledge of the underlying foundation of phenomena and observable facts, without any particular application or use in view.
   - *Applied Research* - refers to original investigation undertaken in order to acquire new knowledge.
   - *Experimental Development* - refers to systematic work, drawing on knowledge gained from research and practical experience and producing additional knowledge, which is directed to producing new products or processes or to improving existing produts or processes.

4. For the Government and Higher Education sectors, an annual questionnaire is compiled and sent to all the Central Government Ministries and Departments, Extra Budgetary Units, as well as Local Councils.

5. For the Business Enterprise sector, an annual questionnaire is sent to all known active R&D enterprises.

6. The data contained in this news release have been drawn up in line with the Frascati Manual (2015 edition). The definitions of the fields of science and technology and their sub-fields are available online: http://nso.gov.mt/en/nso/Sources_and_Methods/Unit_A2/Public_Finance/Pages/Research-and-Development-in-Malta-(Government-Sector).aspx

7. All data in this release should be considered as provisional and therefore subject to revision.

8. More information relating to this news release may be accessed at:

   Statistical Concepts: http://nso.gov.mt/metadata/concepts.aspx
   Metadata: http://nso.gov.mt/metadata/reports.aspx?id=3 (GOV and HES)
   Metadata: http://nso.gov.mt/metadata/reports.aspx?id=26 (BES)

European statistics comparable to data in this News Release are available at:

http://ec.europa.eu/eurostat

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