

In 2016, total expenditure on Research and Development amounted to €58.7 million, or 0.58 per cent of GDP.

Research and Development in Malta: 2014-2016

R&D Expenditure

In 2016, a decrease of €12.8 million was recorded in total expenditure on R&D activities, equivalent to 17.9 per cent over 2015. The Business Enterprise sector contributed 62.0 per cent to total R&D, whereas the Higher Education and Government sectors contributed 36.7 and 1.3 per cent respectively (Table 1).

Primarily the R&D expenditure is earmarked to Basic Research, with a 54.0 per cent of total R&D in 2016, followed by Applied Research (32.7 per cent) and Experimental Development (13.3 per cent). Refer to methodological note 3 for the definition of each type of R&D activity (Table 2).

In 2016 the three R&D sectors of performance reported a drop in total R&D expenditure compared to 2015. The lower R&D expenditure was triggered by lower outlays on capital expenditure of €12.9 million, mainly as a result of completion of R&D infrastructure in the Government sector in 2015. In the Business Enterprise sector an increase in recurrent costs of €1.6 million was outweighed by a reduction of €2.0 million in capital expenditure. In the Higher Education sector, a decrease was registered in both recurrent and capital costs by €1.2 million and €0.2 million respectively. Labour costs represented 70.2 per cent of total R&D expenditure, whereas other recurrent expenditure and capital projects had a share of 16.7 per cent and 13.1 per cent respectively (Table 3).

In 2016, the highest rate of R&D activity was recorded in Engineering and Technology which accounted for 49.6 per cent of total expenditure, followed by Natural Sciences (18.3 per cent) and Medical Sciences (12.2 per cent). Year-on-year comparisons show that the highest decreases were registered in Medical Sciences (€10.3 million) and Natural Sciences (€3.8 million). Conversely, Engineering and Technology reported a growth of €4.5 million (Table 4).

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

Each sector mostly funds its own research, complemented by foreign funds, mainly local business enterprise funds for the Business Enterprise sector, general university funds for the Higher Education sector and EU funds or Direct Government funds for the Government sector. Foreign funds for R&D reached €6.3 million, or 10.7 per cent of total funds (Table 5).

R&D Employment

In 2016, 2,408 employees were engaged in R&D work, of who 1,405 dedicated part of their working time to R&D. The highest R&D employment rate was registered in the Higher Education sector, at 1,218 employees, followed by the Business Enterprise sector, with 1,111 employees (Table 6).

With regard to employment by major field of science, in 2016 the highest employment activity in R&D was recorded in Engineering and Technology with 754 employees, followed by Natural and Social sciences, with 621 and 413 employees respectively (Table 7).

GBARD

In 2017, the highest outlays of Government budget allocations for R&D (GBARD) were recorded in the socio-economic activities related to Health (€5.3 million), Industrial Production and Technology (€4.6 million) and Culture, recreation, religion and media (€4.0 million). Compared to 2016, GBARD increased by €1.0 million (Table 8) ■

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

	€000s		
	2014	2015	2016
Government Sector (GOV)	6,042	11,803	764
Business Enterprise Sector (BES)	33,460	36,729	36,366
Higher Education Sector (HES)	21,037	22,960	21,571
Total R&D expenditure	60,539	71,491	58,702
% of GDP	0.71	0.75	0.58

* Source: Gross Domestic Product as published in News Release No. 089/2018

Note: Totals may not add up due to rounding.

Chart 1. R&D Expenditure by sector of performance

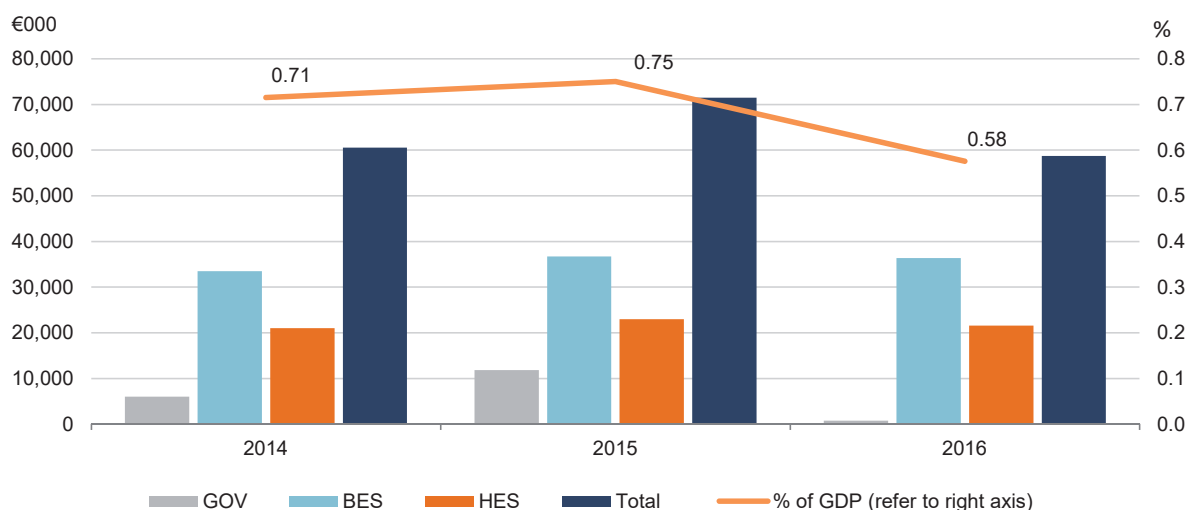


Table 2. Total expenditure on R&D by type of activity

	€000s			
	GOV	BES	HES	Total
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
2016				
Basic Research	182	10,026	21,507	31,715
Applied Research	582	18,532	65	19,179
Experimental Development	0	7,808	0	7,808
Total	764	36,366	21,571	58,702

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
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
2016				
Recurrent Expenditure	749	32,084	18,206	51,040
Labour Costs	652	26,158	14,414	41,225
Other Recurrent Expenditure	97	5,926	3,792	9,814
Capital Expenditure	15	4,282	3,365	7,662
Land and Buildings	15	764	1,164	1,943
Instruments and Equipment	0	3,517	2,201	5,719
Total Expenditure	764	36,366	21,571	58,702

Note: Totals may not add up due to rounding.

Chart 2. R&D Expenditure by type of costs: 2016

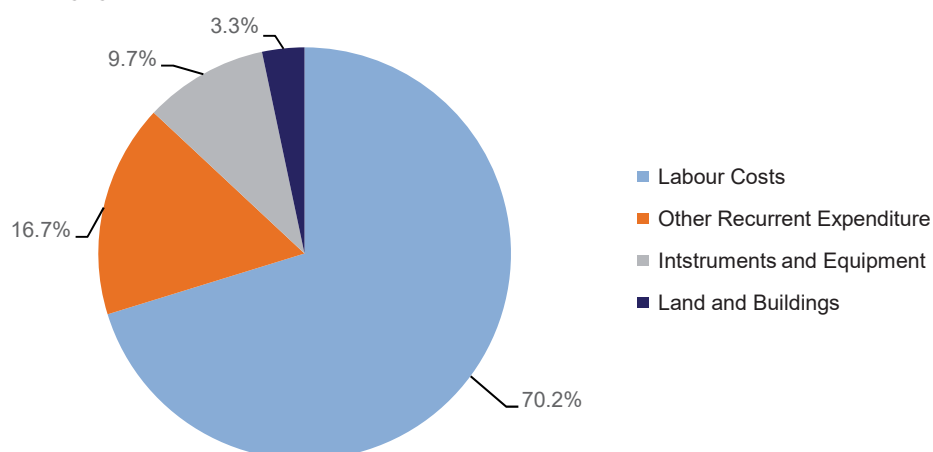


Table 4. Total expenditure on R&D by major field of science

		€000s						
		Natural sciences	Engineering and Technology	Medical sciences	Agricultural sciences	Social sciences	Humanities	Total
GOV	2014	113	28	5,134	731	35	3	6,042
	2015	25	70	8,638	3,044	0	25	11,803
	2016	0	0	172	441	85	67	764
BES	2014	12,023	17,331	2,675	462	315	653	33,460
	2015	11,939	20,118	3,683	322	141	525	36,729
	2016	8,638	24,806	2,224	241	315	143	36,366
HES	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
	2016	2,112	4,294	4,753	247	6,506	3,659	21,571
Total	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
	2016	10,750	29,100	7,149	929	6,906	3,869	58,702

Note: Totals may not add up due to rounding.

Table 5. Source of funds of R&D expenditure

		€000s																						
		GOV			BES			HES			Total													
		2014	2015	2016	2014	2015	2016	2014	2015	2016	2014	2015	2016											
Sources of Funds																								
Local Funds													873	2,646	758	28,531	33,478	32,222	18,424	20,787	19,420	47,828	56,910	52,400
	Business Enterprise	250	160	160	27,824	32,411	31,721	52	51	93	28,126	32,622	31,974											
	Direct Government	623	2,486	598	637	1,066	501	1,073	2,419	1,461	2,333	5,971	2,559											
	General University Funds	0	0	0	0	0	0	16,495	17,488	17,023	16,495	17,488	17,023											
	Others*	0	0	0	69	1	0	804	829	844	873	830	844											
Foreign Funds													5,169	9,157	7	4,929	3,251	4,143	2,613	2,173	2,152	12,712	14,581	6,302
	Foreign Business Enterprises	0	0	0	3,372	1,536	2,987	0	0	0	3,372	1,536	2,987											
	European Commission	5,169	9,157	0	1,307	1,575	1,017	1,594	1,309	1,255	8,070	12,040	2,271											
	Others*	0	0	7	250	140	140	1,019	864	897	1,269	1,004	1,044											
Total		6,042	11,803	764	33,460	36,729	36,366	21,037	22,960	21,571	60,539	71,491	58,702											

* Includes private non-profit organisations, international organisations and foreign higher education institutions

Note: Totals may not add up due to rounding.

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

	headcount											
	GOV			BES			HES			Total		
	2014	2015	2016	2014	2015	2016	2014	2015	2016	2014	2015	2016
Full-time	29	29	29	824	807	904	94	55	69	947	891	1,002
Males	25	27	26	659	655	718	44	28	42	728	710	786
Females	4	2	3	165	152	186	50	27	27	219	181	216
Part-Time*	24	43	50	253	219	207	1,087	1,222	1,149	1,364	1,484	1,406
Males	18	28	37	200	176	158	642	706	666	860	910	861
Females	6	15	13	53	43	49	445	516	483	504	574	545
Total	53	72	79	1,077	1,026	1,111	1,181	1,277	1,218	2,311	2,375	2,408
Males	43	55	63	859	831	876	686	734	708	1,588	1,620	1,647
Females	10	17	16	218	195	235	495	543	510	723	755	761
Researchers	27	34	33	473	515	584	849	863	853	1,349	1,412	1,470
Males	18	25	23	364	407	454	557	577	571	939	1,009	1,048
Females	9	9	10	109	108	130	292	286	282	410	403	422
Technicians	1	3	10	399	300	296	98	121	107	498	424	413
Males	1	3	10	356	275	267	80	91	82	437	369	359
Females	0	0	0	43	25	29	18	30	25	61	55	54
Support staff	25	35	36	205	211	231	234	293	258	464	539	525
Males	24	27	30	139	149	155	49	66	55	212	242	240
Females	1	8	6	66	62	76	185	227	203	252	297	285

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

Chart 3. R&D Employment: 2016

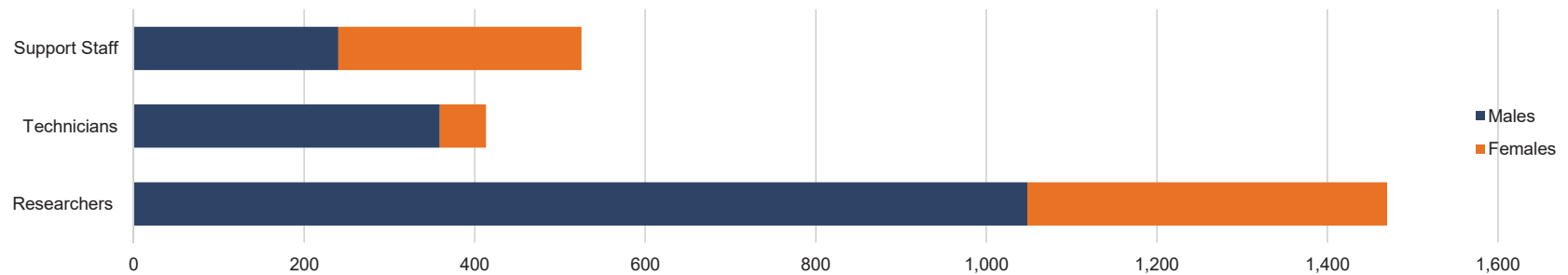


Table 7. R&D employment by major field of science

								headcount
		Natural sciences	Engineering and Technology	Medical sciences	Agricultural sciences	Social sciences	Humanities	Total
GOV	2014	6	7	3	34	2	1	53
	2015	1	0	10	60	0	1	72
	2016	0	0	16	49	13	1	79
BES	2014	515	438	34	6	13	71	1,077
	2015	489	411	41	4	14	67	1,026
	2016	502	508	40	2	24	35	1,111
HES	2014	133	242	256	18	345	187	1,181
	2015	134	251	280	18	382	212	1,277
	2016	119	246	272	17	376	188	1,218
Total	2014	654	687	293	58	360	259	2,311
	2015	624	662	331	82	396	280	2,375
	2016	621	754	328	68	413	224	2,408

Table 8. Government Budget Allocations for R&D (GBARD)

				€000s
Socio-economic objective	2014	2015	2016	2017
Exploration and exploitation of the earth	0	1	0	0
Environment	1,834	2,203	1,908	1,852
Exploration and exploitation of space	0	0	0	0
Transport, telecommunication and other infrastructures	45	29	76	62
Energy	112	66	57	92
Industrial production and technology	3,686	4,946	4,112	4,550
Health	4,305	6,503	4,647	5,265
Agriculture	748	1,019	571	301
Education	2,086	2,397	2,213	2,358
Culture, recreation, religion and media	3,771	4,182	3,961	3,966
Political and social systems, structures and processes	2,580	2,938	2,721	2,842
General advancement of knowledge	0	0	0	0
Defence	0	0	0	0
Total	19,167	24,285	20,266	21,287

Note: Totals may not add up due to rounding.

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 products 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](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:

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