

In 2017, total expenditure on Research and Development amounted to €65.9 million, or 0.58 per cent of GDP.

Research and Development in Malta: 2015-2017

R&D Expenditure

During 2017, an increase of €7.2 million was registered in total expenditure on R&D activities, equivalent to 12.3 per cent. The Business Enterprise sector contributed 65.3 per cent to total R&D, whereas the Higher Education and Government sectors contributed 33.8 and 0.9 per cent respectively (Table 1).

Primarily the R&D expenditure is dedicated to Basic Research, with a 52.1 per cent of total R&D in 2017, followed by Applied Research (32.6 per cent) and Experimental Development (15.3 per cent) (Table 2).

In 2017, both the Business Enterprise sector and the Higher Education Sector reported an increase in R&D expenditure compared to 2016. The higher R&D expenditure was triggered by higher outlays on recurrent expenditure of €7.6 and €2.8 million respectively. Capital expenditure for these two sectors dropped by €0.9 and €2.1 million respectively. The Government sector registered a drop of €0.2 million, primarily in recurrent expenditure. Labour costs represented 72.2 per cent of total R&D expenditure, followed by recurrent expenditure (20.7 per cent) and capital projects (7.1 per cent) (Table 3).

In 2017, the highest rate of R&D activity was recorded in Engineering and Technology which accounted for 45.7 per cent of total expenditure, followed by Natural Sciences (22.0 per cent) and Medical Sciences (16.0 per cent). Year-on-year comparisons show that the highest increase was registered in Natural Sciences €3.7 million followed by Medical Sciences €3.4 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 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 €7.1 million, or 10.8 per cent of total funds (Table 5).

R&D Employment

In 2017, 2,479 employees were engaged in R&D work, of who 1,451 dedicated part of their time to R&D. The highest R&D employment rate was registered in the Higher Education sector, at 1,280 employees, followed by the Business Enterprise sector, with 1,117 employees. Male employment was predominant among researchers and technicians, while females led the support staff category. Females accounted for 34.7 per cent of total R&D employment (Table 6).

With regard to employment by major field of science, in 2017 the highest employment activity in R&D was recorded in Engineering and Technology with 806 employees, followed by Natural Sciences and Social Sciences, with 607 and 450 employees respectively (Table 7).

GBARD

In 2018, the highest outlays of Government budget allocations for R&D (GBARD) were recorded in the socio-economic activities related to Health (€6.0 million), Culture, recreation, religion and media (€4.4 million), Political and social systems, structures and processes and Industrial production and technology (both €4.1 million). Compared to 2017, GBARD increased by €3.8 million (Table 8) ■

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

	€000s		
	2015	2016	2017
Government Sector (GOV)	11,803	764	607
Business Enterprise Sector (BES)	36,729	36,366	43,072
Higher Education Sector (HES)	22,960	21,571	22,248
Total R&D expenditure	71,491	58,702	65,928
% of GDP	0.74	0.57	0.58

* Source: Gross Domestic Product as published in News Release No. 090/2019

Note: Totals may not add up due to rounding

Chart 1. R&D Expenditure by sector of performance

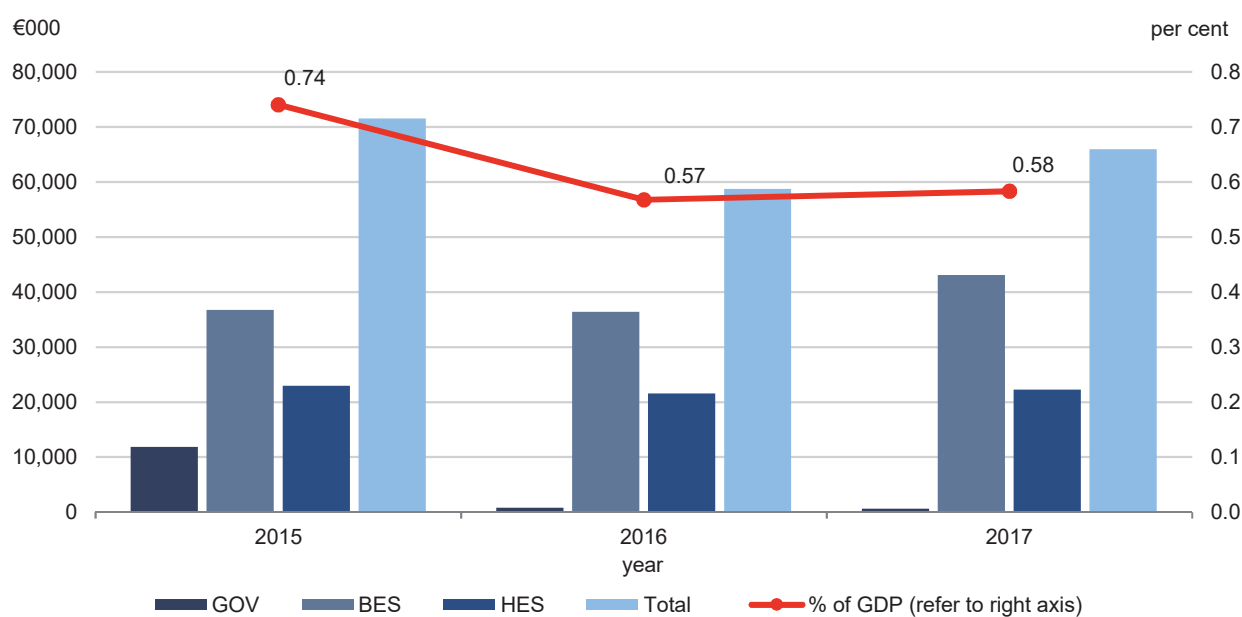


Table 2. Total expenditure on R&D by type of activity

	€000s			
	GOV	BES	HES	Total
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
2017				
Basic Research	457	11,761	22,135	34,353
Applied Research	150	21,245	114	21,509
Experimental Development	0	10,066	0	10,066
Total	607	43,072	22,248	65,928

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
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
2017				
Recurrent Expenditure	599	39,715	20,966	61,280
Labour Costs	496	29,649	17,477	47,622
Other Recurrent Expenditure	103	10,066	3,489	13,657
Capital Expenditure	8	3,357	1,283	4,648
Land and Buildings	6	618	523	1,147
Instruments and Equipment	2	2,739	760	3,501
Total Expenditure	607	43,072	22,248	65,928

Note: Totals may not add up due to rounding

Chart 2. R&D Expenditure by type of costs: 2017

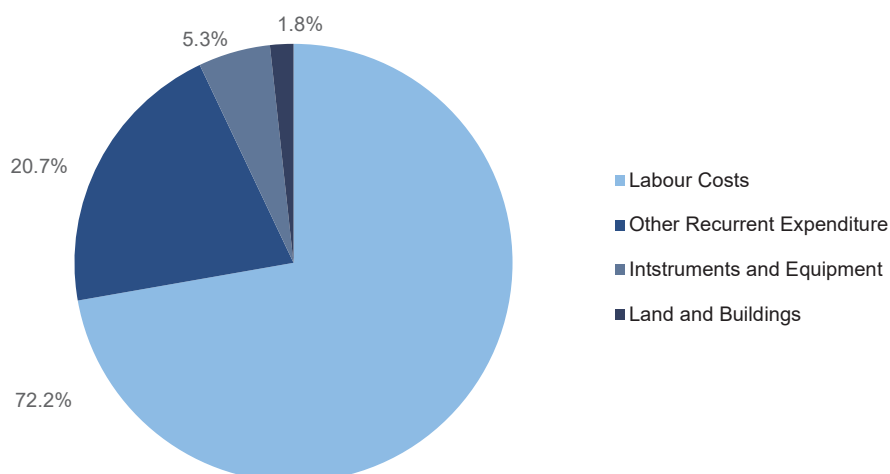


Table 4. Total expenditure on R&D by major field of science

€000s

		Natural sciences	Engineering and Technology	Medical sciences	Agricultural sciences	Social sciences	Humanities	Total
GOV	2015	25	70	8,638	3,044	0	25	11,803
	2016	0	0	172	441	85	67	764
	2017	28	0	0	239	290	50	607
BES	2015	11,939	20,118	3,683	322	141	525	36,729
	2016	8,638	24,806	2,224	241	315	143	36,366
	2017	12,173	25,609	5,104	59	81	46	43,072
HES	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
	2017	2,293	4,546	5,421	302	6,404	3,283	22,248
Total	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
	2017	14,493	30,155	10,525	601	6,775	3,379	65,928

Table 5. Source of funds of R&D expenditure

€000s

	GOV			BES			HES			Total		
	2015	2016	2017	2015	2016	2017	2015	2016	2017	2015	2016	2017
Sources of Funds												
Local Funds	2,646	758	600	33,478	32,222	38,013	20,787	19,420	20,220	56,910	52,400	58,833
Business Enterprise	160	160	0	32,411	31,721	36,994	51	93	164	32,622	31,974	37,158
Direct Government	2,486	598	600	1,066	501	941	2,419	1,461	751	5,971	2,559	2,292
General University Funds	0	0	0	0	0	25	17,488	17,023	18,331	17,488	17,023	18,356
Others ¹	0	0	0	1	0	53	829	844	974	830	844	1,027
Foreign Funds	9,157	7	7	3,251	4,143	5,059	2,173	2,152	2,028	14,581	6,302	7,094
Foreign Business Enterprises	0	0	0	1,536	2,987	4,005	0	0	0	1,536	2,987	4,005
European Commission	9,157	0	0	1,575	1,017	1,054	1,309	1,255	1,224	12,040	2,271	2,279
Others ¹	0	7	7	140	140	0	864	897	804	1,004	1,044	811
Total	11,803	764	607	36,729	36,366	43,072	22,960	21,571	22,248	71,491	58,702	65,928

(1) Others category may include private non-profit organisations, international organisations and foreign higher education institutions.

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

	Headcount											
	GOV			BES			HES			Total		
	2015	2016	2017	2015	2016	2017	2015	2016	2017	2015	2016	2017
Full-time	29	29	7	807	904	937	55	69	84	891	1,002	1,028
Males	27	26	6	655	718	713	28	42	50	710	786	769
Females	2	3	1	152	186	224	27	27	34	181	216	259
Part-Time ¹	43	50	75	219	207	180	1,222	1,149	1,196	1,484	1,406	1,451
Males	28	37	40	176	158	139	706	666	672	910	861	851
Females	15	13	35	43	49	41	516	483	524	574	545	600
Total	72	79	82	1,026	1,111	1,117	1,277	1,218	1,280	2,375	2,408	2,479
Males	55	63	46	831	876	852	734	708	722	1,620	1,647	1,620
Females	17	16	36	195	235	265	543	510	558	755	761	859
Researchers	34	33	32	515	584	591	863	853	923	1,412	1,470	1,546
Males	25	23	25	407	454	444	577	571	599	1,009	1,048	1,068
Females	9	10	7	108	130	147	286	282	324	403	422	478
Technicians	3	2	1	300	296	352	121	107	106	424	405	459
Males	3	2	1	275	267	287	91	82	77	369	351	365
Females	0	0	0	25	29	65	30	25	29	55	54	94
Support staff	35	44	49	211	231	174	293	258	251	539	533	474
Males	27	38	20	149	155	121	66	55	46	242	248	187
Females	8	6	29	62	76	53	227	203	205	297	285	287

(1) Spending a proportion of their working time on R&D activities

Chart 3. R&D Employment: 2017

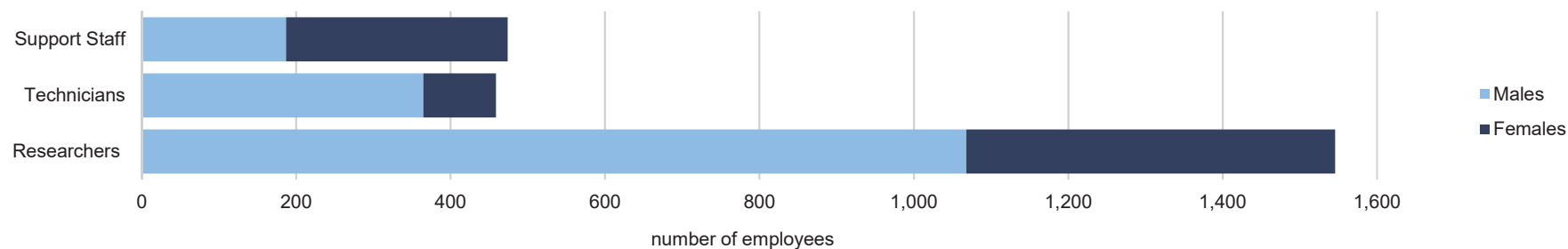


Table 7. R&D employment by major field of science

		Headcount						
		Natural sciences	Engineering and Technology	Medical sciences	Agricultural sciences	Social sciences	Humanities	Total
GOV	2015	1	0	10	60	0	1	72
	2016	0	0	16	49	13	1	79
	2017	0	0	3	32	45	2	82
BES	2015	489	411	41	4	14	67	1,026
	2016	502	508	40	2	24	35	1,111
	2017	475	548	66	1	6	21	1,117
HES	2015	134	251	280	18	382	212	1,277
	2016	119	246	272	17	376	188	1,218
	2017	132	258	283	16	399	192	1,280
Total	2015	624	662	331	82	396	280	2,375
	2016	621	754	328	68	413	224	2,408
	2017	607	806	352	49	450	215	2,479

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

	€000s			
Socio-economic objective	2015	2016	2017	2018
Exploration and exploitation of the earth	0	0	0	1
Environment	2,154	1,749	1,848	3,027
Exploration and exploitation of space	0	0	0	308
Transport, telecommunication and other infrastructures	0	50	72	29
Energy	22	69	106	31
Industrial production and technology	4,377	3,825	4,479	4,065
Health	6,484	4,679	5,285	6,017
Agriculture	1,019	515	516	1,263
Education	2,397	2,263	2,404	2,565
Culture, recreation, religion and media	4,182	4,303	3,972	4,355
Political and social systems, structures and processes	4,389	3,385	3,225	4,084
General advancement of knowledge	0	0	0	0
Defence	0	0	0	0
TOTAL	25,023	20,839	21,906	25,746

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: <https://nso.gov.mt/metadata/reports.aspx?id=26> (BES)

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

[EUROSTAT Website/Homepage/Statistics Database](#)

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