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Innovation

Business Research and Innovation 2004-2006

Business Research and Innovation surveys revealed that, despite high innovation costs and limited funds for research, enterprises were able to offer an increased range of goods and services and an improvement in quality.

The surveys request information regarding Research and Development as well as Innovation initiatives split up between new and/or improved innovative products and innovative processes coupled with the investment to implement them.

Innovation Expenditure

In 2006, the Post and Telecommunications sector represented the highest percentage share of total innovation expenditure, at approximately 21 per cent, followed by the Food and Beverages sector at 20 per cent. On the other hand the Chemicals and Chemical products sector recorded the highest intramural Research and Development expenditure at approximately 29 per cent.

Type of Innovation Activity

A total of 1,207 enterprises were surveyed, with a response rate of about 70 per cent. Enterprises which reported product and/or process innovations totalled 232, whilst another 5 enterprises reported ongoing or abandoned innovation activity.

Research and Development Personnel

Responding enterprises reported a total of 585 persons employed in Research and Development of whom 468 were males and 117 females. Of these, 12 were Ph.D. graduates and 409 held a university degree or a tertiary diploma.

Factors Hampering Innovation

From the 2006 Innovation Survey it emerged that the main obstructions to innovation activity for both innovative as well as non-innovative enterprises were high innovation costs followed by lack of funds.

Effects of Innovation Activities

The principal effects of innovation activities observed by enterprises were an improvement in the quality of goods and services offered and an increase in the range of goods and services offered ■

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Table 1. Innovation expenditure 2006 ...

Nace	Economic Sector	No of innovative units	Intramural R&D		Extramural R&D		Acquisition of machinery and equipment		Acquisition of other external knowledge		Total expenditure		Percentage distribution of	
			Lm 000	€ 000	Lm 000	€ 000	Lm 000	€ 000	Lm 000	€ 000	Lm 000	€ 000	Total expenditure	intramural R&D
15	Manufacture of food and beverages	21	276	643	17	38	7,701	17,939	11	26	8,005	18,646	19.87	2.88
17-18	Manufacture of textiles; manufacture of wearing apparel; dressing and dyeing of fur	4	33	76	0	0	3	7	0	0	36	83	0.09	0.34
20-21	Manufacture of wood and of products of wood and cork, except furniture; manufacture of articles of straw and plaiting materials; manufacture of pulp, paper and paper products	3	0	0	0	0	17	40	0	0	17	40	0.04	0.00
22	Publishing, printing, reproduction of recorded media	13	21	49	0	0	2,647	6,166	22	52	2,691	6,267	6.68	0.22
24	Manufacturing of chemicals and chemical products	9	2,792	6,503	837	1,951	69	161	5	12	3,703	8,627	9.19	29.15
25	Manufacturing of rubber and plastic products	8	441	1,027	0	0	252	586	0	0	693	1,613	1.72	4.60
26	Manufacture of other non-metallic mineral products	7	8	17	7	17	58	135	0	0	73	169	0.18	0.08
28	Manufacturing of fabricated metal products	8	7	17	0	0	602	1,402	0	0	609	1,419	1.51	0.08
29	manufacturing of machinery and equipment n.e.c.	3	160	373	20	47	45	105	0	0	225	524	0.56	1.67
30-31	Manufacture of office machinery and computers; manufacturing of electrical machinery and apparatus n.e.c.	7	896	2,087	25	58	225	524	14	33	1,160	2,702	2.88	9.36
32	Manufacturing of radio, television and communication equipment	9	2,229	5,192	12	28	316	736	39	91	2,596	6,047	6.44	23.28
33	Manufacturing of medical, precision and optical instruments	3	477	1,111	328	765	877	2,042	0	0	1,682	3,918	4.17	4.98
35-37, 41	Manufacture of other transport equipment; manufacturing of furniture, manufacturing n.e.c.; recycling; collection, purification and distribution of water	12	19	44	0	0	450	1,048	0	0	469	1,092	1.16	0.20

... Table 1. Innovation expenditure 2006

Nace	Economic Sector	No of innovative units	Intramural R&D		Extramural R&D		Acquisition of machinery and equipment		Acquisition of other external knowledge		Total expenditure		Percentage distribution of	
			Lm 000	€ 000	Lm 000	€ 000	Lm 000	€ 000	Lm 000	€ 000	Lm 000	€ 000	Total expenditure	intramural R&D
45	Construction	4	0	0	0	0	80	186	0	0	80	186	0.20	0.00
50	Sale, maintenance and repair of motor vehicles and motorcycles; retail sale of automotive fue	4	0	0	0	0	6	14	0	0	6	14	0.01	0.00
51	Wholesale trade and commission trade	37	5	10	0	0	259	603	21	49	285	663	0.71	0.05
52	Retail trade	14	6	14	0	0	411	957	2	5	419	976	1.04	0.06
55	Hotels and restaurants	9	5	12	0	0	180	420	10	23	195	455	0.48	0.05
60-62	Land transport; transport via pipelines; water transport; air transport	4	123	287	0	0	147	343	198	461	468	1,091	1.16	1.28
63	Supporting and auxiliary transport activities; activities of travel agencies	8	22	51	0	0	4,736	11,031	8	18	4,765	11,099	11.83	0.23
64	Post and telecommunications	7	70	163	100	233	4,510	10,505	3,945	9,190	8,625	20,090	21.40	0.73
65	Financial intermediation, except insurance and pension funding	6	246	573	0	0	523	1,219	17	40	787	1,833	1.95	2.57
66	Insurance and pension funding, except compulsory social security	5	28	64	0	0	103	240	0	0	131	305	0.32	0.29
67	Activities auxiliary to financial intermediation	7	151	352	0	0	49	113	1	2	201	467	0.50	1.58
72-73	Computer and related activities; reserch and development	12	1,519	3,539	1	2	682	1,588	0	0	2,202	5,129	5.46	15.87
74	Other business activities	13	43	101	20	47	96	224	13	31	173	402	0.43	0.45
Total		237	9,576	22,306	1,367	3,185	25,044	58,336	4,307	10,033	40,294	93,860	100.00	100.00

Table 2. Innovation expenditure 2004

Nace	Economic Sector	No of innovative units	Intramural R&D		Extramural R&D		Acquisition of machinery and equipment		Acquisition of other external knowledge		Total expenditure		Percentage distribution of	
			Lm 000	€ 000	Lm 000	€ 000	Lm 000	€ 000	Lm 000	€ 000	Lm 000	€ 000	Total expenditure	intramural R&D
15	Manufacture of food and beverages	16	124	290	6	14	1,241	2,900	21	49	1,392	3,252	4.80	1.49
22	Publishing, printing, reproduction of recorded media	11	1,502	3,509	0	0	5,848	13,664	2	5	7,352	17,178	25.34	18.08
24	Manufacturing of chemicals and chemical products	8	1,933	4,516	0	0	5,022	11,734	0	0	6,955	16,250	23.97	23.27
25	Manufacturing of rubber and plastic products	8	47	110	50	117	441	1,030	10	23	548	1,280	1.89	0.57
28	Manufacturing of fabricated metal products	6	45	105	4	9	827	1,932	8	19	884	2,065	3.05	0.54
29	Manufacturing of machinery and equipment n.e.c.	3	171	400	0	0	5	12	0	0	176	411	0.61	2.06
31	Manufacturing of electrical machinery and apparatus n.e.c.	5	277	647	30	70	260	607	30	70	597	1,395	2.06	3.33
32	Manufacturing of radio, television and communication equipment	7	990	2,313	57	133	462	1,079	29	68	1,538	3,593	5.30	11.92
33	Manufacturing of medical, precision and optical instruments	4	27	63	196	458	65	152	0	0	288	673	0.99	0.33
36	Manufacturing of furniture, manufacturing n.e.c.	7	110	257	1	2	189	442	4	9	304	710	1.05	1.32
51	Wholesale trade and commission trade	27	149	348	19	44	555	1,297	3	7	726	1,696	2.50	1.79
52	Retail trade	9	17	40	5	12	33	77	38	89	93	217	0.32	0.20
60-64	Transport, storage and communication	9	70	164	100	234	2,190	5,117	732	1,710	3,092	7,224	10.66	0.84
65-67	Financial intermediation	13	339	792	0	0	955	2,231	0	0	1,294	3,023	4.46	4.08
72-73	Computer and related activities	11	2,448	5,720	1	2	535	1,250	5	12	2,989	6,984	10.30	29.47
74	Other business activities	6	2	5	0	0	72	168	0	0	74	173	0.26	0.02
Other manufacturing*		7	55	129	89	208	39	91	0	0	183	428	0.63	0.66
Other**		15	0	0	0	0	522	1,220	11	26	533	1,245	1.84	0.00
Total		172	8,306	19,407	558	1,304	19,261	45,002	893	2,086	29,018	67,799	100.00	100.00

* 'Other manufacturing' includes Nace divisions:

16 - Manufacture of tobacco products
 17 - Manufacture of textiles
 18 - Manufacture of wearing apparel; dressing and dyeing of fur
 20 - Manufacture of wood and of products of wood and cork, except furniture; manufacture of articles of straw and plaiting materials
 26 - Manufacture of other non-metallic mineral products

** 'Other' includes Nace divisions:

41 - Collection, purification and distribution of water
 45 - Construction
 50 - Sale, maintenance and repair of motor vehicles and motorcycles; retail sale of automotive fuel
 55 - Hotels and restaurants

Other Nace divisions not mentioned above did not report any innovation for the period.

Table 3. Enterprises by type of innovation activity

	Size class (by number of employees)						Total		Percentage distribution	
	between 10 and 49		between 50 and 249		250 or more					
	2002-2004	2004-2006	2002-2004	2004-2006	2002-2004	2004-2006	2002-2004	2004-2006	2002-2004	2004-2006
All enterprises	955	957	200	206	39	44	1,194	1,207	100.00	100.00
Enterprises with innovation activity:										
Product innovator only	38	31	6	8	1	1	45	40	26.20	16.88
Process innovator only	14	63	6	23	1	5	21	91	12.20	38.40
Both product and process	41	63	14	24	11	14	66	101	38.40	42.62
Ongoing and / or abandoned innovation activities only	24	4	9	0	7	1	40	5	23.20	2.11
Total	117	161	35	55	20	21	172	237	14.40	19.64
Non-innovative enterprises	838	796	165	151	19	23	1,022	970	85.60	80.36

Table 4. Enterprises indicating high importance of selected factors hampering innovation activity

	Size class (by number of employees)						Total	
	between 10 and 49		between 50 and 249		250 or more		2002-2004	2004-2006
	2002-2004	2004-2006	2002-2004	2004-2006	2002-2004	2004-2006		
Lack of funds within your enterprise or enterprise group								
Innovative enterprises	17	24	5	9	1	1	23	34
Non-innovative enterprises	36	49	4	5	0	0	40	54
Lack of finance from sources outside your enterprise								
Innovative enterprises	14	20	2	3	0	1	16	24
Non-innovative enterprises	31	37	2	4	0	0	33	41
Innovation costs too high								
Innovative enterprises	23	29	6	5	2	3	31	37
Non-innovative enterprises	70	63	9	5	0	0	79	68
Lack of qualified personnel								
Innovative enterprises	11	12	1	3	2	1	14	16
Non-innovative enterprises	16	17	4	0	0	0	20	17
Lack of information on technology								
Innovative enterprises	3	4	2	0	0	0	5	4
Non-innovative enterprises	16	11	3	1	0	0	19	12
Lack of information on markets								
Innovative enterprises	9	10	1	1	2	1	12	12
Non-innovative enterprises	20	12	4	0	0	0	24	12
Difficulty in finding cooperation partners for innovation								
Innovative enterprises	7	12	1	1	1	1	9	14
Non-innovative enterprises	16	13	1	2	1	1	18	16
Markets dominated by established enterprises								
Innovative enterprises	18	16	4	4	3	4	25	24
Non-innovative enterprises	40	46	7	5	0	1	47	52
Uncertain demand for innovative goods or services								
Innovative enterprises	21	16	3	6	3	3	27	25
Non-innovative enterprises	62	35	9	6	0	1	71	42

Table 5. Enterprises which have co-operation arrangements on innovation activities

	Size class (by number of employees)						Total	
	between 10 and 49		between 50 and 249		250 or more			
	2002-2004	2004-2006	2002-2004	2004-2006	2002-2004	2004-2006	2002-2004	2004-2006
Lack of funds within your enterprise or enterprise group	12	12	7	5	6	7	25	24
Lack of finance from sources outside your enterprise	19	22	7	6	9	8	35	36
Innovation costs too high	15	16	5	5	7	5	27	26
Lack of qualified personnel	5	4	2	3	2	3	9	10
Lack of information on technology	14	12	4	2	5	3	23	17
Lack of information on markets	4	5	0	0	3	2	7	7
Difficulty in finding cooperation partners for innovation	5	3	1	0	1	0	7	3

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Table 6. Location of partners with co-operation arrangements on innovation activities

	Size class (by number of employees)						Total	
	between 10 and 49		between 50 and 249		250 or more			
	2002-2004	2004-2006	2002-2004	2004-2006	2002-2004	2004-2006	2002-2004	2004-2006
National	16	22	5	4	3	4	24	30
Other Europe	16	22	9	9	10	8	35	39
United States and other countries	13	6	7	5	7	5	27	16

Table 7. Research and development personnel

	Males				Females			
	Full-time		Part-time		Full-time		Part-time	
	2004	2006	2004	2006	2004	2006	2004	2006
Researchers	142	177	36	48	34	48	9	14
Technicians and equivalents	96	139	25	44	11	14	1	10
Other supporting staff	38	33	17	27	17	19	2	12
Total	276	349	78	119	62	81	12	36
Ph.D. graduates	5	9	4	2	0	0	0	1
Other University degrees and tertiary diplomas	172	261	34	69	35	62	5	17
Other qualification including experience	99	79	40	48	27	19	7	18
Total	276	349	78	119	62	81	12	36

Table 8. Enterprises indicating high (observed) effects of innovation activities

	Size class (by number of employees)						Total	
	between 10 and 49		between 50 and 249		250 or more		2002-2004	2004-2006
	2002-2004	2004-2006	2002-2004	2004-2006	2002-2004	2004-2006		
Increased range of goods and services	24	41	8	13	5	9	37	63
Entered new markets or increased market share	15	20	8	10	8	6	31	36
Improved quality in goods or services	28	38	3	19	6	10	37	67
Improved production flexibility or service provision	12	23	7	10	7	10	26	43
Increased production capacity or service provision	11	22	7	11	6	7	24	40
Reduced labour costs per unit produced	6	12	3	8	6	6	15	26
Reduced materials and energy per unit produced	2	8	1	6	5	4	8	18
Reduced environmental impacts or improved health	13	13	1	8	6	3	20	24
Complied with regulations or standards	19	29	4	14	6	6	29	49

Methodological Notes

The statistical unit surveyed is the enterprise as per Council Regulation (EEC) No 2186/93. The Survey is conducted in accordance with Commission Regulation on Innovation Statistics No 1450/2004 as well as Commission Regulation on R&D Statistics No 753/2004.

The target population is the minimum coverage requested, namely total enterprises with 10 or more employed.

The following activities are included in the target population:

- mining and quarrying (NACE 10-14)
- manufacturing (NACE 15-37)
- electricity, gas and water supply (NACE 40-41)
- wholesale trade (NACE 51)
- transport, storage and communication (NACE 60-64)
- financial intermediation (NACE 65-67)
- computer and related activities (NACE 72)
- architectural and engineering activities (NACE 74.2)
- technical testing and analysis (NACE 74.3)

Additional coverage was also conducted for the following non-core activities:

- research and development (NACE 73)
- construction (NACE 45)
- motor trade (NACE 50)
- retail trade (NACE 52)
- legal, accounting, market research, consultancy and management services (NACE 74.1)
- advertising (NACE 74.4)
- labour recruitment and provision of personnel (NACE 74.5)
- investigation and security activities (NACE 74.6)
- industrial cleaning services (NACE 74.7)
- miscellaneous business activities n.e.c. (NACE 74.8)
- real estate activities (NACE 70)
- hotels and restaurants (NACE 55)
- renting of machinery and equipment without an operator (NACE 71)

Innovation, for the purposes of the survey, is defined as:

1. Product innovation (goods and services) with the following features:

- the new technology leads to a better performance of the good or service
- a broadening of the product or service range is accomplished

2. Process innovation with the following features:

- processes become more automated or integrated
- more flexibility is achieved
- quality improvement
- improvement of safety or environment
- the new technology leads to more efficient routing and planning
- the more flexibility in distribution
- improvement of stock control

Note: ISO-certification is only an innovation when it is directly related to the introduction of new or improved processes.