R&D investments worldwide

January 2016- April 2018
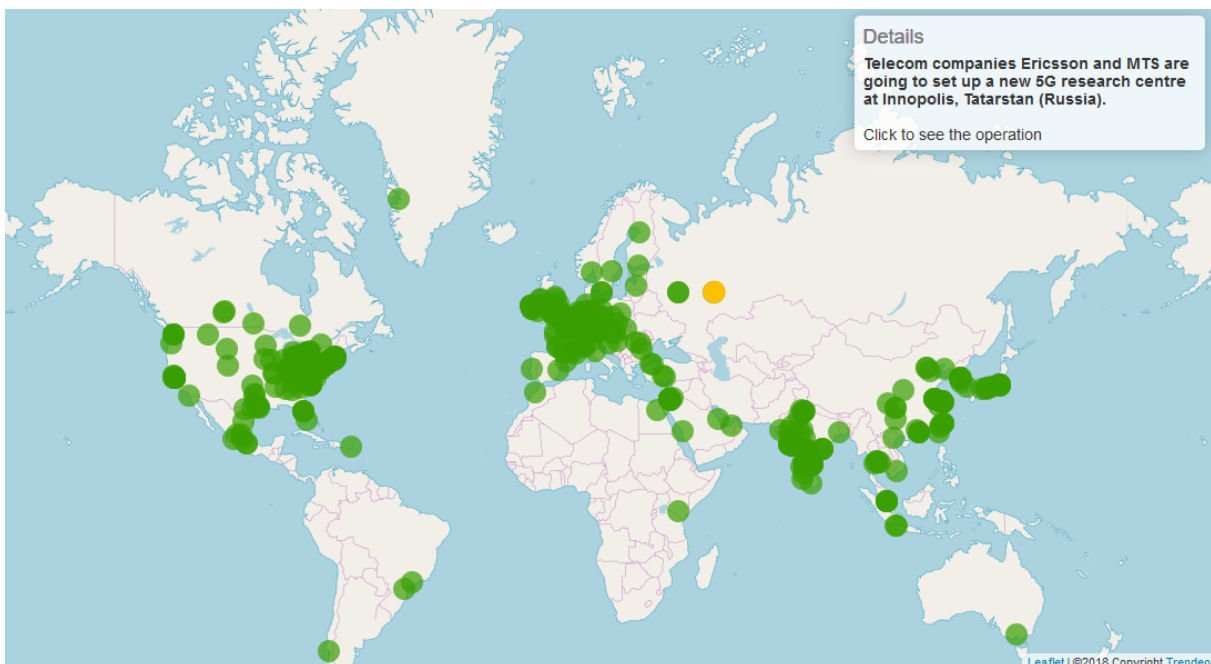
Industries & Strategies database, by Trendeo

R&D

January 2016 - April 2018

418 projects announced

37 billion dollars

134 541 jobs

The Industries & Strategies database, created and distributed by Trendeo, tracks, since 2016, every industrial investment (manufacturing, energy, logistics, R&D) announced worldwide (over 30 MUSD or 50 jobs). Each information is classified by product, sector, company, country, even a qualitative score (factories of the future score). Since january 2016, 8 973 investments have been tracked, among them 418 for R&D projects (4,7%). As the database is updated weekly, our users benefit from a more detailed information, including cancelled investments, factories of the future score details, capacity…

In the database, each information is described precisely across 30 quantitative and qualitative fields. The tables below synthetize the available data alongside different criteria.

R&D among other activities

Each project in our Industries & Strategies database is classified by sector but also alongside the type of activities performed. We have defined nine type of activities, including R&D. The table below show that R&D makes almost 5% of projects, but due to an average amount per project lower than global average, represents only 1% of amounts invested.

Production type	Projects	%	Jobs	%	M$	%	M$/project
Manufacturing	5 459	60,8%	1 686 731	79,4%	1 627 596	43,1%	298
Power generation and/or distribution	1 421	15,8%	55 238	2,6%	999 036	26,5%	703
Mining and quarrying	447	5,0%	68 443	3,2%	925 169	24,5%	2 070
Logistic platform	701	7,8%	157 248	7,4%	132 554	3,5%	189
R&D	418	4,7%	134 541	6,3%	37 562	1,0%	90
Data center	184	2,1%	8 539	0,4%	27 073	0,7%	147
Water treatment plant	162	1,8%	882	0,0%	15 699	0,4%	97
Waste treatment plant	118	1,3%	2 611	0,1%	7 735	0,2%	66
Agriculture, forestry and fishing	63	0,7%	9 769	0,5%	4 609	0,1%	73
Sum	8 973	100%	2 124 002	100%	3 777 033	100%	421

Number of projects, jobs and investment, by type of activities, 2016-2018

Geographical repartition of R&D investments

R&D is much concentrated than overall investment: the top 20 countries, in terms of amount invested, gather almost 99% of R&D, whereas for all activities, the top 20 countries collect only 80% of amounts invested.

The United Kingdom comes first by amount invested, mainly due to a huge investment by Dyson in Malmesbury, in the electric car sector (2 500 M$, announced in 2016). India would come first by number of projects, one project ahead of the United States: both countries get a lot of R&D projects with comparatively smaller average amount invested per project. Asian countries represent 57% of investments, Europe (including Turkey and Israel) collect 30% and Americas slightly less than 13%.

Rank	Country	Projects	%	Jobs	%	M$	%	M$/project
1	United Kingdom	25	6,0%	7 709	5,7%	5 478	14,6%	219
2	China	30	7,2%	3 000	2,2%	5 372	14,3%	179
3	United States	94	22,5%	13 022	9,7%	4 164	11,1%	44
4	India	95	22,7%	85 520	63,6%	3 723	9,9%	39
5	South Korea	6	1,4%	-	0,0%	3 707	9,9%	618
6	Taiwan	6	1,4%	210	0,2%	3 450	9,2%	575
7	Japan	11	2,6%	1 210	0,9%	3 147	8,4%	286
8	Sweden	3	0,7%	-	0,0%	2 788	7,4%	929
9	France	21	5,0%	1 570	1,2%	999	2,7%	48
10	Vietnam	2	0,5%	6 400	4,8%	900	2,4%	450
11	Singapore	5	1,2%	50	0,0%	798	2,1%	160
12	Italy	4	1,0%	500	0,4%	654	1,7%	164
13	Canada	14	3,3%	1 668	1,2%	552	1,5%	39
14	Germany	23	5,5%	6 400	4,8%	548	1,5%	24
15	Czechia	2	0,5%	257	0,2%	161	0,4%	81
16	Norway	1	0,2%	200	0,1%	132	0,4%	132
17	Thailand	5	1,2%	330	0,2%	128	0,3%	26
18	Austria	2	0,5%	-	0,0%	121	0,3%	61
19	Turkey	4	1,0%	100	0,1%	101	0,3%	25
20	Israel	7	1,7%	25	0,0%	100	0,3%	14
	Top 20 countries	360	86,1%	128 171	95,3%	37 023	98,6%	103
	30 other countries	58	13,9%	6 370	4,7%	539	1,4%	9
	Sum	418	100%	134 541	100%	37 562	100%	90

R&D investments by country, 2016-2018, tracked by Trendeo,
by number of projects, jobs created, and amounts invested.

Regions

Among the 25 top regions (out of 160 regions in which R&D investments have been tracked),.4 countries are present with several regions: India, China, the United States and Germany. Karnataka (mainly Bangalore), is the first region by number of projects. By amount invested, Chinese regions would have obtained the top three ranks (England would be first but we will adopt soon another definition for the British regions, which will change this situation). California is the first North-American region, followed by Ontario. Île-de-France is the first region for continental Europe.

Rank	Region	Projects	%	Jobs	%	M$	%
1	Karnataka	25	6,0%	14 535	10,8%	1 165	3,1%
2	England	22	5,3%	7 659	5,7%	5 434	14,5%
3	Telangana	20	4,8%	41 255	30,7%	355	0,9%
4	Maharashtra	19	4,5%	6 690	5,0%	449	1,2%
5	California	14	3,3%	550	0,4%	934	2,5%
6	Ontario	11	2,6%	1 668	1,2%	525	1,4%
7	Shanghai	9	2,2%	2 320	1,7%	1 143	3,0%
8	Tamil Nadu	9	2,2%	270	0,2%	683	1,8%
9	Ile-de-France	9	2,2%	905	0,7%	476	1,3%
10	Ohio	8	1,9%	142	0,1%	348	0,9%
11	Andhra Pradesh	8	1,9%	16 550	12,3%	307	0,8%
12	North Carolina	8	1,9%	2 645	2,0%	146	0,4%
13	Texas	8	1,9%	865	0,6%	13	0,0%
14	Jiangsu	7	1,7%	30	0,0%	1 548	4,1%
15	Bavaria	7	1,7%	3 100	2,3%	400	1,1%
16	Michigan	7	1,7%	570	0,4%	151	0,4%
17	Massachusetts	6	1,4%	650	0,5%	279	0,7%
18	North Rhine-Westphalia	6	1,4%	0	0,0%	18	0,0%
19	Central Singapore	5	1,2%	50	0,0%	798	2,1%
20	Tel Aviv	5	1,2%	25	0,0%	0	0,0%
21	Guangdong	4	1,0%	0	0,0%	1 974	5,3%
22	Tokyo	4	1,0%	660	0,5%	170	0,5%
23	Florida	4	1,0%	1 050	0,8%	56	0,1%
24	Tennessee	3	0,7%	0	0,0%	412	1,1%
25	Washington	3	0,7%	150	0,1%	300	0,8%
	Top 25 regions	**231**	**55,3%**	**102 339**	**76,1%**	**18 084**	**48,1%**
	135 other regions	187	45%	32 202	24%	19 478	52%
	Sum	**418**	**100%**	**134 541**	**100%**	**37 562**	**100%**

R&D investments by region, 2016-2018, tracked by Trendeo, by number of projects, jobs created and amounts invested.

Industries & Strategies database, by Trendeo

Cities

By city and by number of projects, three Indian cities come ahead of our rankings. By amount invested, Hsinchu (Taiwan), would be first, with just one R&D project on semiconductors by TSMC. Munich is ahead of Paris, although Île-de-France is stronger than Bavaria, because of Saclay. Singapore and Tel Aviv occupy positions five and six, and Toronto is the first north-american city, just before Durham (North-Carolina), in the Research Triangle.

Rank	City	Country	Projects	Jobs	M$
1	Bengaluru	India	21	7 835	872
2	Hyderabad	India	20	41 255	355
3	Pune	India	10	5 750	236
4	Shanghai	China	8	2 180	1 120
5	Singapore	Singapore	5	50	798
6	Tel Aviv	Israel	5	25	0
7	Nanjing	China	4	30	1 062
8	Chennai	India	4	100	375
9	Munich	Germany	4	1 100	306
10	Paris	France	4	305	175
11	Toronto	Canada	4	400	111
12	Durham	United States	4	355	37
13	Shenzhen	China	3	0	1 450
14	Santa Clara	United States	3	200	934
15	Coventry	United Kingdom	3	1 060	375
16	Seattle	United States	3	150	300
17	Devanhalli	India	3	6 300	278
18	Tirupati	India	3	50	80
19	Visakhapatnam	India	3	10 000	77
20	Manchester	United Kingdom	3	800	65
21	Mumbai	India	3	350	53
22	Taipei	Taiwan	3	210	34
23	Tokyo	Japan	3	160	9
24	Palo Alto	United States	3	0	0
25	Seoul	South Korea	2	0	3 541
26	Lund	Sweden	2	0	2 766
27	Malmesbury	United Kingdom	2	4 500	2 745
28	Saclay	France	2	600	272
29	Cambridge	United States	2	150	240
30	Mississauga	Canada	2	273	152

Top cities by number of R&D projects received, jobs and investment amount received, 2016-2018

Foreign Direct Investment and R&D

Of the 418 projects, 230 (55%) are Foreign Direct Investment projects. The table below show that this share varies among countries, from 100% of foreign projects (Mexico, Italy, Romania) to no foreign R&D projects (Turkey, Sweden).

Country	Projects	Domestic	FDI	FDI share
India	95	44	51	54%
United States	94	51	43	46%
China	30	10	20	67%
United Kingdom	25	12	13	52%
Germany	23	13	10	43%
France	21	14	7	33%
Canada	14	4	10	71%
Japan	11	9	2	18%
Ireland	9	2	7	78%
Israel	7	1	6	86%
Mexico	7		7	100%
South Korea	6	4	2	33%
Taiwan	6	1	5	83%
Singapore	5	1	4	80%
Thailand	5	2	3	60%
Italy	4		4	100%
Turkey	4	4		0%
Sweden	3	3		0%
Netherlands	3	2	1	33%
Romania	3		3	100%
Russia	3	1	2	67%

R&D sorted by FDI and domestic, 2016-2018, tracked by Trendeo.

Industries & Strategies database, by Trendeo

R&D Investment by company

Out of the 300 companies that invested in R&D from 2016 to 2018, the ranking by number of projects are very different from the ranking by amount invested (only Samsung and GE are in both top 15 rankings). By amount invested, electronics, automotive and pharmaceuticals companies take all the top spots. Two public investments are to be noticed there, both in Europe.

Company	Projects	Company	M$
Apple	7	LG	3 660
Ford	6	Taiwan Semiconductor Manufacturing	3 411
Biocon	6	Dyson	3 306
Mondelez	6	Toyota Motor	2 811
Infosys	6	European Spalliation project (public)	2 055
Tata Group	5	HTC	1 450
Hyundai Motor Group	5	Merck Group	1 347
Continental	5	**General Electric**	**1 027**
Cargill	5	Novartis	1 000
Amazon	5	Hitachi Group	934
General Electric	**4**	**Samsung**	**900**
Samsung	**4**	GlaxoSmithKline	762
Thales Group	4	Hon Hai Precision Industry	717
Porsche Automobil Holding	4	Swedish Research / Lund University	711
Daimler	4	Pfizer	650

Top 15 companies by number of R&D projects announced (left) and by amount invested (right).

R&D sectors

The *automotive industry* is the first sector by number of projects with almost 20% of R&D projects tracked. *Electronics* is first by amount invested.

Sector	Projects	%	Jobs	%	M$	%	M$/project
Automotive	72	17,2%	18 775	14,0%	8 360	22,3%	116
Pharmaceutical	41	9,8%	5 050	3,8%	5 103	13,6%	124
Electronics	40	9,6%	12 335	9,2%	11 899	31,7%	297
Scientific research and development	38	9,1%	3 273	2,4%	3 890	10,4%	102
Chemicals	31	7,4%	2 248	1,7%	1 120	3,0%	36
Computer programming	30	7,2%	30 855	22,9%	892	2,4%	30
Food	21	5,0%	1 858	1,4%	386	1,0%	18
Machinery	19	4,5%	3 160	2,3%	586	1,6%	31
Electrical equipment	15	3,6%	3 040	2,3%	1 827	4,9%	122
Information services	15	3,6%	20 670	15,4%	633	1,7%	42
Aeronautics	10	2,4%	4 000	3,0%	638	1,7%	64
Plastic and rubber	9	2,2%	881	0,7%	119	0,3%	13
Retail trade	8	1,9%	14 750	11,0%	-	0,0%	-
Other industries	8	1,9%	707	0,5%	204	0,5%	26
Engineering	8	1,9%	240	0,2%	188	0,5%	24
Top 15 sectors	365	87,3%	121 842	90,6%	35 845	95,4%	98
24 other sectors	53	12,7%	12 699	9,4%	1 717	4,6%	32
Sum	418	100%	134 541	100%	37 562	100%	90

R&D investments by sector, 2016-2018, in number of projects, jobs and amount invested. Last column: average amount invested by project.

At a finer level, *artificial intelligence* takes third place, with 5% of projects, computer programming adding another 4% to the list of digital activities. Other fields are mixing traditional activities and computer programming, such as *autonomous vehicle*. There is a digital and computer part for many traditional sectors.

Sector	Projects	%	M$	%	M$/project
automotive	30	7,2%	1 128	3,0%	38
pharmaceutical	27	6,5%	4 336	11,5%	161
artificial Intelligence	20	4,8%	351	0,9%	18
part and accessory for motor vehicle	17	4,1%	647	1,7%	38
computer programming	17	4,1%	344	0,9%	20
electronics	15	3,6%	5 307	14,1%	354
food	11	2,6%	48	0,1%	4
chemicals	10	2,4%	491	1,3%	49
biopharmaceutical	8	1,9%	454	1,2%	57
financial services	7	1,7%	92	0,2%	13
machinery	7	1,7%	175	0,5%	25
aircraft component	6	1,4%	462	1,2%	77
medical device	6	1,4%	204	0,5%	34
autonomous vehicle	6	1,4%	500	1,3%	83
IoT (Internet of Things) for computer programming	6	1,4%	378	1,0%	63
electric car	6	1,4%	5 556	14,8%	926
household electric appliance	6	1,4%	1 161	3,1%	194
agrochemicals	5	1,2%	53	0,1%	11
rubber tire	5	1,2%	133	0,4%	27
chocolate	5	1,2%	15	0,0%	3

R&D investments by product, 2016-2018, in number of projects and amount invested. Last column: average amount invested by project.

Industries & Strategies database, by Trendeo

Top projects

The following table lists the ten biggest investments announced since january 2016 (we recorded in our database some projects that had been announced before but were discussed again since January 2016). Those ten investments represent 53% of the total amount invested through the 418 projects tracked by Trendeo.

Description	M$
LG is investing 3,5 bn USD to set up a new R&D cluster ("LG Science Park"), consisting of 18 R&D centres in various domains for electronics, near Seoul (South Korea).	3 541
Semiconductor chip maker Taiwan Semiconductor Manufacturing (TSMC) is planning to invest more than 3,4 bn USD to set up a new R&D facility in Hsinchu (Taiwan).	3 411
Toyota Motor is going to invest more than 2,8 bn USD to set up a new R&D hub, including test tracks, for electric vehicles near Nagoya, Aichi (Japan).	2 811
UK-based vacuum maker Dyson plans to invest 2.5 bn USD to develop and build its own electric car by 2020 in a new facility at Hullavington, Wiltshire (United Kingdom), that will eventually double the company's 4,000 staff in the UK.	2 500
Swedish and Danish governments, along with EU and other European countries, are investing 2 bn USD in the research facility European Spallation Source at Lund (Sweden).	2 055
Taiwanese company HTC is partnered with the Shenzhen government to establish a 1,45 bn USD investment fund and set up a virtual reality R&D center in Shenzhen (China).	1 450
German pharmaceutical giant Merck is planning to invest around 1,3 bn USD to set up a new drug discovery facility near London (United Kingdom).	1 347
The Swiss pharmaceutical company Novartis has recently opened a 1 bn USD new research centre for drug development at Shanghai (China).	1 000
The Japanese Hitachi invested 934 million USD in a new R & D center for the Internet of Things in Santa Clara (USA).	934
Taiwan's electronics contractor Foxconn plans to invest 717 MUSD to set up a new R&D centre for terminal devices and smartwear in Nanjing, Jiangsu (China).	717
GlaxoSmithKline, along with U.S. partner Verily (a subsidiary of Google parent Alphabet), is investing 712 MUSD in a new bioelectronic medicine research facility at Stevenage (UK).	712
Swedish Research Council and Lund University have recently inaugurated one of the most advanced synchrotron X-ray light facilities in the world at Lund (Sweden).	711
U.S. company GE Oil & Gas is planning to invest 600 MUSD in a new centre of global excellence near Florence (Italy) for the oil and gas sector, which would create 500 new, skilled jobs.	600
South Korea's Samsung Electronics has invested 600 MUSD to set up a new R&D centre near Ho Chi Minh City (Vietnam), creating 400 jobs.	600
UK electrical equipment company Dyson will open a new technology centre in Singapore (Singapore) for 561 MUSD of investments.	561

Industries & Strategies database, by Trendeo

Qualitative scores

Our *factories of the future* score aggregates six components defined with our partners[1]:

- **Flexibility**: the ability to switch from a product to another, enabling made-to-order manufacturing,
- **Digitalization**: the introduction of technologies such as IoT, robotics, automation,
- **Energy efficiency**: every measure taken to lower energy consumption compared with usual norms,
- **Social efforts**: measures undertaken for operations, through working conditions, health and safety concern, training, education and wages…,
- **Territorial efforts**: decisions aiming at improving the relations between a production site and local communities and stakeholders, such as favoring local suppliers, funding schools, contributing to local social projects…,
- **Environmental efforts**: reducing carbon footprint and pollution, water preservation…

Each criterion is ranked 0 (no mention in the news describing the investment), 1 (some measures described) or 2 (quantitative objectives defined for the criterion considered or insistence on it). Adding those 0-2 scores over six criteria gives a total Industry of the Future score which varies from 0 to 12.

There are, listed in the following table, the 9 projects with a score of 6 or more. The average score of an R&D investment is 0,89, lower than the average global score (1,03). In fact R&D projects have lower scores for their *energy efficiency* measures (but they probably are less energy intensive projects) and for their *environmental efforts* (but they also are probably less pollutant emiting than, say, manufacturing projects). The only criteria where R&D projects have higher than average scores are *social efforts* and *digitization*.

Project	Jobs	M$	Efficiency	Flexibility	Digitization	Social Efforts	Environmental Efforts	Territorial Efforts	Score
Germany's BASF has invested 53 MUSD to set up a new global R&D centre for agrochemicals, pharmaceuticals and crop protection research in Mumbai (India), where up to 300 scientists would be able to work.	300	53	2	2	1	1	2	1	9
Hospital and research institute Seattle Children's is investing more than 300 MUSD to set up new immunotherapy R&D facilities ("Building Cure") at its research campus in Seattle, Washington (United States).	-	300	1	2	2	1	1	2	9
GE Power is investing 400 MUSD in a new research centre, its first "Advanced Manufacturing Works" facility, to develop advanced manufacturing technology for the company's energy businesses, at Greenville (United States), which would create 80 new jobs.	80	400	2	-	2	-	2	2	8
U.S. company Intel is investing 171 MUSD to set up a new high-tech design house in Bengaluru (India), which would create 3 000 jobs.	3 000	171	1	1	2	-	2	2	8
LG is investing 3,5 bn USD to set up a new R&D cluster ("LG Science Park"), consisting of 18 R&D centres in various domains for electronics, near Seoul (South Korea).	-	3 541	2	2	1	-	2	-	7
India's software major Infosys would create 1 000 jobs, planning to invest 21 MUSD to set up a new technology and innovation hub in Hartford, Connecticut (United States).	1 000	21	-	1	2	2	-	2	7
EMD Serono has announced 12 MUSD investment to add extensions to its R & D center in Billerica near Boston (USA), and for 120 additional researchers.	-	12	2	-	1	2	2	-	7
Indian company Tata Motors, along with British partners, is building the largest automotive research centre of its kind in Europe, the National Automotive Innovation Centre, at Coventry (UK) for an investment of 201 MUSD.	1 060	201	2	-	2	-	2	1	7
French utility company Suez is setting up a new laboratory for research, development, and testing of specialty chemicals and chemical processes in Tomball, Texas (United States).	85	-	-	2	1	2	1	-	6

[1] Fives, EDF (Electricité de France) and the Institut de la réindustrialisation.

Detailed Sample

Each operation is described on a dedicated page in the database, including information such as production capacity.

Indian software major Wipro has set up a new cybersecurity technology centre in Plano, Texas (United States), which would create up to 600 jobs.

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Company Name : Wipro Limited

Date of announcement : 2018-03-27

Product R&D

Type of product R&D in cybersecurity for computer programming

Description of the proj... The new facility will primarily house the Indian company's U.S. cyber security centre, as well as serve as a hub for advanced analytics. The company has already hired 120 personnel for the centre, with more than half from the U.S. and the remaining from India. The company plans to have up to 600 personnel here by 2020. The company did not require any fiscal incentives for the project.

Factories of the future'... 5

Factories of the Future... It is a state-of-the-art facility. The new jobs pay between USD 70 000 and USD 100 000 a year. The company says it is committed to hiring locally and contributing to science, technology, engineering, and mathematics (STEM) education "to create a better future for all". In 2017, the company was recognised by the Texas Economic Development Corporation with the "Elevate Texas" award for its contribution towards driving growth in the state of Texas.

Digitalisation and num... 1

Social efforts 2

Territorial efforts 2

Link www.thehindu.com/business/.../article23366478.ece

In addition www.businesswire.com/news/.../Wipro-Laun[...]hnology-Center-Plano

www.dallasnews.com/news/.../indian-tec[...]obs-plano-450-likely

Tags : [Add a tag]

The operation

Number of jobs : **600**
Amount of investment : **ND**
Type of operation : **New set-up**
Begining of construction : **2017 S1**
Begining of commercial operation : **2018 S1**
Land area (hectares) : **0**
Building area (m2) : **4181**

Company

Parent company : **Wipro Group**
Type of company : **Large enterprise**
Country : **India**
Website : **www.wipro.com**
ISIN code : **INE075A01022**

Industrial sector

Type of production : **R&D**
Industrial sector : **Computer programming**
ISIC : **J6201 Computer programming activities**
Finished good : **No**
End market : **Telecommunication**

Geographic details

City : **Plano**
Region **Texas**
Country **United States**

Related companies

Finance / shareholders :
Azim Premji Trust
Hasham Traders
Prazim Traders
Zash Traders

Contact

This document is a short synthesis of the data available in the Industries & Strategies database about R&D investments. You can learn much more about this database by contacting Trendeo:

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