

Reader's guide

The country profiles (CPs) in the 2016 *OECD STI Outlook* (STIO) are designed to provide a concise overview of science, technology and innovation (STI) policy and performance in OECD members and selected non-OECD economies.

Each country profile is based on information gathered from the latest country's responses to the *EC (European Commission) / OECD International Survey on STI Policies (STIP)* (formerly OECD STI Outlook Policy Questionnaire), as well as various additional OECD and non-OECD sources. The STIP Survey reviews on a biennial basis major changes in national STI policy portfolios and governance arrangements. Responses are provided by government representatives. The OECD Committee for Scientific and Technological Policy (CSTP) and the European Research and Innovation Committee (ERAC) jointly guarantee the relevance of national input.

Headings in the country profiles are linked to the STIO policy profiles, which examine the main global STI policy trends across countries. Issues featuring in both the policy and country profiles are: *i)* innovation policy governance; *ii)* new sources of growth; *iii)* new challenges; *iv)* universities and public research; *v)* innovation in firms; *vi)* innovative entrepreneurship; *vii)* Information and Communication Technologies (ICT) and Internet infrastructures; *viii)* technology transfer and commercialisation; *ix)* clusters and regional policies; *x)* globalisation; and *xi)* skills for innovation.

Panel 1 presents a table of key indicators on the size of national R&D system as measured by gross domestic expenditure on R&D (GERD), its relative expansion over the past five years and the degree of public commitment to S&T as measured by the share of GERD that is publicly financed.

Panel 2 presents the 'hot STI policy issues', i.e. the most topical STI policy issues in 2016 as reported by CSTP Delegates. The list of hot STI policy issues is standardised and consistent with the headings presented above.

Panels 3, 4 and 5 show the country's performance on three dimensions: economic performance (labour productivity), environmental performance (green productivity), and societal performance (on either one of the following challenges: unemployment, ageing, income inequality, or gender balance in science).

Panel 6 contains a double figure that sheds light on the strengths and weaknesses of the country's STI performance. It uses indicators on the country's national innovation system and performance with respect to: universities and public research; business R&D and innovation; innovative entrepreneurship; ICT and Internet infrastructure; networks, clusters and transfers; and skills for innovation. The dot for each indicator positions the country relative to the OECD median and to the top and bottom five OECD countries. Non-OECD countries are also compared to the OECD benchmarks, and may fall out of the range indicated in the figure (e.g. below the lowest OECD country). All indicators are normalised (by GDP and population cohorts) to take account of the size of the economy and the relevant population cohorts, and are presented as indices (OECD median = 100) for benchmarking purposes.



Panel 7 shows the structural composition of business expenditure on R&D (BERD) in terms of performance of the main industry sectors, firm size and firms' national affiliation. It reflects the country's industry structure and its business innovation efforts.

Panel 8 presents the country's revealed technological advantage (RTA), as measured by international patent applications filed within the Five IP offices (IP5, i.e. Europe, China, Japan, Korea and the United States) in three key technology fields (biotechnology, ICTs, and environment-related technologies). It also shows the number of patents filed by universities and public research institutions in these fields.

Panel 9 gives an overview of the country's policy mix for R&D, i.e. the relative balance between public support granted to the public sector and public support granted to the business sector, the relative balance between direct and indirect forms of support to business innovation, and the orientation and funding modes of public research. Panel 9 also illustrates changes in the policy mix for R&D over the past five years.

Finally, Panel 10, a unique feature in the *STI Outlook*, reflects the balance and relative importance of various government measures to support business R&D and innovation. It is based on the country's self-assessment in its reply to the *EC/OECD International STIP Survey 2016*.

In the text, all amounts are given both in USD in purchasing power parities (PPP) of the relevant year (if available) and in national currencies.

Further details on the methodology, data sources and descriptions of indicators used in the country profile are provided in the methodological annex. Data, metadata as well as the original sources and databases of the indicators used in the STIO 2016 are accessible at the statistical portal IPP.Stat





Abbreviations used in the country profiles:

BERD: Business expenditure on research and development.

EU: European Union.

FDI: Foreign direct investment.

GBAORD: Government Budget Appropriations and Outlays for R&D.

GDP: Gross domestic product.

GERD: Gross expenditure on research and development.

GOVERD: Government expenditure on R&D.

HERD: Higher Education expenditure on R&D.

HEIs: Higher education institutions.

ICT: Information and Communication Technologies.

IP5: Five largest Intellectual Property offices (i.e. Europe, China, Japan, Korea and the United States).

IPRs: Intellectual property rights.

MNEs: Multinational Enterprises.

PCT: Patent Cooperation Treaty

PISA: Programme for International Student Assessment.

PRIs: Public research institutes.

R&D: Research and development.

RTA: Revealed Technology Advantage.

SSS: Smart specialisation strategy (also known as 3S).

STI: Science, technology and innovation.

S&T: Science and technology.

STEM: Science, technology, engineering and mathematics.

TTO: Technology Transfer Office.

USD: United States dollars (converted using the purchasing power parities of the relevant year).

VC: Venture capital.

Synthetic table

Table 1. Comparative performance of national science and innovation systems, 2016

Country relative position: in the top 5 OECD or above (★), in the middle range on par or above OECD median (▲), in the middle range below OECD median (△) and in the bottom 5 OECD or below (○)

		Competences and capacity to innovate									
		Universities and public research			R&D and innovation in firms				Innovative entrepreneurship		
		Public R&D expenditure (per GDP)	Top 500 universities (per GDP)	Publications in the top-quartile journals (per GDP)	Business R&D expenditure (per GDP)	Top 500 corporate R&D investors (per GDP)	Triadic patent families (per GDP)	Trademarks (per GDP)	Venture capital (per GDP)	Young patenting firms (per GDP)	Ease of entrepreneurship index
PUB_XGDP	UNI500_GDP	PUB25_GDP	BE_XGDP	CORPRD500_GDP	PTRIAD_GDP	TRDMRK_GDP	VC_XGDP	PTYG_GDP	EASE_I		
		(a)	(b)	(c)	(d)	(e)	(f)	(g)	(h)	(i)	(j)
Argentina	ARG	△	△	○	○	△	○	○			
Australia	AUS	▲	*	▲	▲	▲	△	▲	△		△
Austria	AUT	▲	▲	▲	*	▲	▲	△	△	*	▲
Belgium	BEL	▲	▲	▲	▲	▲	▲	△	▲	△	△
Brazil	BRA		△	○		△	○	○			○
Canada	CAN	▲	▲	▲	△	△	▲	*	*	○	▲
Chile	CHL	○	△	○	○	△	○	△			△
China	CHN	△	△	○	▲	△	△	○			○
Colombia	COL	○	△	○	○	△					
Costa Rica	CRI	○	△	○	○	△					
Czech Republic	CZE	▲	△	△	▲		△	△	△		△
Denmark	DNK	*	*	*	▲	*	▲	▲	△		▲
Egypt	EGY	△	△	○		△					
Estonia	EST	▲	△	▲	△	△	△	△	△		▲
Finland	FIN	*	*	▲	*	▲	▲	▲	▲	*	▲
France	FRA	▲	△	△	▲	▲	▲	▲	▲	△	▲
Germany	DEU	*	▲	△	▲	▲	*	▲	△	*	▲
Greece	GRC	△	△	△	○	△	○	○	○		△
Hungary	HUN	○	△	△	△	△	△	○	▲		△
Iceland	ISL	▲	△	*	△	△	△	*			△
India	IND	△	△	○	○	△	○	○			○
Indonesia	IDN		△	○	○	△	○	○			△
Ireland	IRL	○	▲	▲	▲	*	△	▲	▲	○	△
Israel	ISR	△	*	▲	*	▲	*	▲	*		○
Italy	ITA	△	▲	△	△	△	△	△	○	▲	*
Japan	JPN	▲	△	△	*	*	*	△	▲	△	▲
Korea	KOR	▲	△	△	*	▲	*	▲	*		△
Latvia	LVA	△	△	○	○	△	△				△
Lithuania	LTU	▲	△	△	○	△	△				▲
Luxembourg	LUX	△	△	△	△	*	▲	*	△		△
Malaysia	MYS	○			○						
Mexico	MEX	○	△	○	○	△	○	△			○
Netherlands	NLD	▲	▲	*	▲	▲	▲	▲	△	▲	*
New Zealand	NZL	△	▲	▲	△	▲	▲	*	△		*
Norway	NOR	▲	△	△	△	△	△	△	▲	▲	△
Peru	PER	○	△		○	△					
Poland	POL	△	△	△	△	△	△	○	○		▲
Portugal	PRT	△	▲	▲	△	△	△	△	▲		▲
Russian Federation	RUS	△	△	○	△	△	○	○	△		▲
Slovak Republic	SVK	△	△	△	△	△	△	○	△		*
Slovenia	SVN	△	▲	▲	▲	△	△	△	△		△
South Africa	ZAF	○	△	○	○	△	○	△	▲		○
Spain	ESP	△	△	△	△	△	△	△	△	○	○
Sweden	SWE	*	*	*	▲	▲	▲	▲	*	*	△
Switzerland	CHE	*	▲	*	▲	*	*	*	▲	*	▲
Thailand	THA	△	△	○	△	△					
Turkey	TUR	△	△	○	△	△	○	△			○
United Kingdom	GBR	△	▲	▲	△	▲	▲	▲	▲	△	▲
United States	USA	△	△	△	▲	▲	▲	▲	*	○	*
EU28	EU28	▲	▲	*	▲	▲	▲	△	▲	▲	

Table 2. Comparative performance of national science and innovation systems, 2016

Country relative position: in the top 5 OECD or above (★), in the middle range on par or above OECD median (▲), in the middle range below OECD median (△) and in the bottom 5 OECD or below (○)

		Interaction and skills for innovation												
		ICT and internet infrastructures				Networks, clusters and transfers				Skills for innovation				
		ICT investment (per GDP)	Fixed broadband subscribers (per population)	Wireless broadband subscribers (per population)	E- government readiness index	Industry financed public R&D expenditure (per GDP)	Patents filed by universities and public labs (per GDP)	International co- authorship (%)	International co-invention (%)	Tertiary education expenditure (per GDP)	Adult population at tertiary education level (%)	Top adult performers in technology problem solving (%)	Top 15 year-old performers in science (%)	Doctoral graduate rate in science and engineering (%)
		ICTINV_XGD P (k)	FBBAND_HA B (l)	WBBAND_H AB (m)	EGOV_I (n)	PUB_BEF_X GDP (o)	PATPRI_XGD P (p)	INTCOA_XS A (q)	COPAT_XIP5 (r)	TER_XGDP (s)	ADTERPOP_XT (t)	TOPAD_PST_XA D (u)	TOP15_SCI_XT (v)	PHDR_SCIEN G_XOOH (w)
Argentina	ARG		○	○	○	○	△	△	△	○	○		○	○
Australia	AUS	▲	△	*	*	▲	△	△	△	▲	▲	▲	*	▲
Austria	AUT	▲	△	△	△	▲	▲	▲	▲	△	△	△	△	▲
Belgium	BEL	▲	▲	△	△	*	*	*	*	▲	▲	▲	▲	△
Brazil	BRA		○	○	○		△	○	▲	○	○		○	
Canada	CAN	△	▲	△	▲	▲	▲	△	▲	*	*	▲	▲	△
Chile	CHL		○	△	△	○	△	*	▲	*	○	○	○	○
China	CHN		○	○	○	▲	△	○	△		○		*	
Colombia	COL		○	○	○					▲	△		○	
Costa Rica	CRI		○	○	○						△		○	
Czech Republic	CZE	*	△	△	○	△	△	△	*	△	△	△	△	▲
Denmark	DNK	▲	*	▲	▲	△	▲	▲	△	▲	△	▲	△	▲
Egypt	EGY		○	○	○									
Estonia	EST	▲	△	▲	▲	△	○	▲	*	▲	▲	△	*	△
Finland	FIN	△	▲	*	▲	▲	▲	▲	△	▲	▲	*	*	*
France	FRA	▲	*	△	*	△	*	△	△	△	△		▲	▲
Germany	DEU	△	▲	△	△	*	*	△	△	△	△	▲	▲	*
Greece	GRC	○	▲	○	△	△	△	△	▲	△	△	○	○	△
Hungary	HUN		△	○	△	△	△	▲	▲	△	△		△	△
Iceland	ISL		▲	▲	▲	▲	○	*	▲	○	△		△	△
India	IND		○	○	○		△	○	▲	○				
Indonesia	IDN		○	○	○			*	*	△	○		○	
Ireland	IRL	△	△	▲	▲	○	▲	▲	▲	△	▲	△	▲	▲
Israel	ISR		△	△	▲	△	*	△	△	▲	*	△	△	△
Italy	ITA	△	△	△	△	△	▲	△	○	○	○		△	△
Japan	JPN	*	△	*	*	△	▲	○	○	▲	*	▲	*	△
Korea	KOR	△	▲	▲	*	▲	*	○	○	*	*	△	▲	△
Latvia	LVA		△	△	△	▲	○			○	△		△	△
Lithuania	LTU		○	○	△	*				*	▲	○	△	
Luxembourg	LUX	○	▲	▲	△	○	△	*	*	○	▲		▲	△
Malaysia	MYS				○						△		○	
Mexico	MEX	○	○	○	○	○	△	△	▲	△	○		○	○
Netherlands	NLD	▲	*	△	*	*	▲	▲	△	▲	△	*	▲	▲
New Zealand	NZL	*	▲	*	▲	▲	△	▲	▲	▲	▲	*	*	▲
Norway	NOR		*	▲	▲	▲	△	▲	△	▲	▲	*	△	▲
Peru	PER		○		○						△		○	
Poland	POL		○	△	△	△	▲	△	▲	△	△	○	▲	○
Portugal	PRT	△	△	○	△	△	△	▲	▲	△	△		△	▲
Russian Federation	RUS		○	△	△	*	△	△	*	△	*	△	○	
Slovak Republic	SVK	○	△	▲	○	▲	○	▲	*	△	△	△	△	▲
Slovenia	SVN	△	△	△	△	▲	▲	△	△	△	△	△	▲	▲
South Africa	ZAF		○	○	○	△	△	△	△	○	○			○
Spain	ESP	△	△	▲	▲	△	△	△	△	△	▲		△	△
Sweden	SWE	*	▲	*	▲	▲	△	▲	△	▲	▲	*	△	*
Switzerland	CHE	*	*	▲	△	*	△	*	▲	△	▲		▲	*
Thailand	THA		○	○	○		△			*	○		○	
Turkey	TUR		○	△	○	*	△	○	△	▲	○	○	○	○
United Kingdom	GBR	△	▲	▲	▲	△	▲	△	△	*	▲	▲	▲	*
United States	USA	▲	▲	▲	▲	△	▲	○	○	*	*	△	△	△
EU28	EU28	△	△	△		▲	▲				△		△	△

Note: Non-OECD countries are also compared to OECD countries and may therefore be out of range (e.g. lower than the lowest OECD country). They appear in this table with top five and bottom five OECD values.

Israel: "The statistical data for Israel are supplied by and under the responsibility of the relevant Israeli authorities. The use of such data by the OECD is without prejudice to the status of the Golan Heights, East Jerusalem and Israeli settlements in the West Bank under the terms of international law."



Source: See references and methodological annex of the OECD STI Outlook 2016 country profiles.




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From:

OECD Science, Technology and Innovation Outlook 2016

Access the complete publication at:

https://doi.org/10.1787/sti_in_outlook-2016-en

Please cite this chapter as:

OECD (2016), “STI country profiles reader's guide”, in *OECD Science, Technology and Innovation Outlook 2016*, OECD Publishing, Paris.

DOI: https://doi.org/10.1787/sti_in_outlook-2016-44-en

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