

# Methodology

In its ambitious fourth edition, CTA expands the Global Innovation Scorecard from 70 countries to evaluate 74 countries, including the entire G-20, all 27 members of the European Union, and the EU as a whole. The Global Scorecard includes large and established trading partners of the United States, and many emerging market countries driving innovations in fields ranging from health and finance to transportation.

In total, the Global Scorecard is a comparative analysis of 56 indicators across 16 categories. Our measurements identify the countries that most strongly encourage tech innovation, economic growth, and social progress, and the policies other countries could emulate to deliver similar benefits to their people.

We consider demographic factors, such as the share of immigrants in a country's population and the gender equality of its workforce, the availability of high-skilled workers, and the ease with which its people can start new businesses. We look at political and cultural dimensions, including the freedom of religion, movement, information and expression. We evaluate the health of a country's environment, including the quality of its air and water. We consider a country's legal climate, the extent of official corruption, and the health of its regulatory enforcement efforts and civil justice institutions.

We evaluate whether governments impose arbitrary restrictions about where data is routed and stored. We consider whether governments place unduly onerous restrictions on or single out widespread Web

2.0 technologies, such as social media platforms, and whether they welcome Web 3.0 technologies, such as cryptocurrencies, dapps and Decentralized Autonomous Organizations (DAOs).

Finally, we consider a country's rules surrounding technological trade, and emerging technologies of great potential benefit, such as telehealth and self-driving vehicles.

All third-party sources and policy inputs reflect the latest information available as of August 23, 2024. **As always, we welcome your comments and feedback by email at [scorecard@cta.tech](mailto:scorecard@cta.tech).**

## Eligibility of Countries

In the 2025 Global Innovation Scorecard, CTA evaluates countries for which:

- Publicly available, verifiable and independent third-party data exists;
- Comparable data across nations exists; and
- Governments can influence public policy.

## European Union

Under the treaties on which the European Economic Community is based, the European Union establishes policies in certain areas but allows its member states to establish policies of their own in others. This presents a challenge when evaluating EU states, as they must be evaluated on their merits, but should not be penalized for policies they themselves have not chosen to enact. As a result, CTA has both graded the EU in its entirety, and evaluated each of its 27 member states individually, on the respective indicators in each category.



## Acts Green

evaluates the quality of a country’s air and drinking water. Metric A considers air quality, measuring concentrations of fine particulate matter (PM2.5, in µg/m3) using World Health Organization data ([Source 1](#)). Countries earn an ‘A’ for meeting or falling below the WHO Air Quality Guideline, an annual mean of PM2.5 of 10µg/m3, a ‘B’ for 10-15µg/m3, ‘C’ for 15-25µg/m3, ‘D’ for 25-35µg/m3, and ‘F’ for over 35µg/m3 or data not available.

Metric B measures drinking water by percentage of the population using improved drinking water sources, using the [WHO](#). Countries earn an ‘A’ for 100% of the population using improved drinking-water sources, a ‘B’ for 91-99%, a ‘C’ for 76-90%, a ‘D’ for 50-75%, and an ‘F’ for less than 50% or data not available.

For each measure, the letter grades are converted to numeric scores, with ‘A’ equaling 4 points, ‘B’ equaling 3 points, ‘C’ equaling 2 points, ‘D’ equaling 1 point, and ‘F’ equaling 0 points. The resulting scores are averaged

into a composite score for the category, and converted back into letter grades according to the following table:

Grade Min		Grade Max
0.000	F	0.337
0.338	D-	0.681
0.682	D	1.026
1.027	D+	1.371
1.372	C-	1.715
1.716	C	2.060
2.061	C+	2.404
2.405	B-	2.749
2.750	B	3.000
3.001	B+	3.251
3.252	A-	3.502
3.503	A	3.753
3.754	A+	4.000



## Actual Diversity

measures the concentration of various ethnic groups within a country and the gender gap in its workforce. Metric A assesses the country’s ethnic diversity based on immigration data, using an adaptation of the Herfindahl-Hirschman Index, a method most commonly used to measure corporate concentration within a given industry, relying on the [CIA World Factbook](#), and [Michele Tribalat](#) (France) [Istituto Nazionale di Statistica](#) (Italy), [Britannica](#) (Malta), and [minorityrights.org](#) (Rwanda). Metric B assesses the share of immigrants as a percentage of a country’s population, using the [United Nations Department of Economic and Social Affairs, Population Division, International Migrant Stock 2020](#). Metric C assesses the ratio of female-to-male participation in the country’s labor force among people ages 25-54, drawing on the [World Economic Forum: Global Gender Gap Report, 2024](#). The scores in each metric are normalized, and then averaged, producing a letter grade.



## Allows Cross-Border Data Flows

evaluates the extent to which a country permits the flow of data without onerous and/or arbitrary requirements that create hindrances for end users or operators of online systems including, but not limited to, cloud storage and streaming media.

A country earns -1 point if it has a data localization law, requiring online services such as cloud storage providers to store data within its borders.

A country earns -1 point if it has a data transfer law, requiring online services such as cloud storage providers to route data flows according to strict directives.

A country earns -1 point if it has a data mirroring law, requiring online services such as cloud storage providers to store data within its borders.

A country earns +1 point if it has engaged in bilateral or multilateral discussions to allow for easier flow of data, and/or taken steps to promote international interoperability among different privacy systems.



### Blockchain Friendly

evaluates the degree to which a country allows people to use Web 3.0 technologies without onerous requirements or unnecessary hindrances.

**A** — The country allows its nationals to exchange hard currency for cryptocurrency and vice versa without significant restrictions. Does the country possess a variety of crypto-friendly banking and financial services, such as Binance, Bitstamp, Coinbase, Crypto.com, Gemini, etc.

**B** — A country has no law or regulation prohibiting the use of cryptocurrency. It may have some restrictions on the exchange of cryptocurrency (e.g., EU MiCA stablecoin laws). The country also has an active blockchain startup environment, characterized by the operation of multiple blockchain companies there, though these companies need not be incorporated in the country.

**C** — The country allows its nationals to exchange hard currency for cryptocurrency and vice versa, but with significant restrictions, such as unique taxes assessed at the point of

A country earns +2 points if it has not passed data localization, transfer, or mirroring regulations.

A country earns +1 point if its data flows are determined by an individual's consent to platform terms and services.

A country earns +2 points if it participates in the Asia-Pacific Economic Cooperation (APEC) Cross-Border Privacy Rules.

**A** = a country earns  $\geq 1$  point.

**C** = a country earns -1 to 0 points.

**F** = a country earns -3 to -2 points.

conversion (rather than simply the standard applicable income taxes under existing national law). It may restrict banks from processing cryptocurrency transactions.

**D** — The country allows its nationals to exchange hard currency for cryptocurrency and vice versa, but places substantial restrictions on them. Such restrictions might include unique taxes assessed at the point of conversion between cryptocurrency and hard currency (rather than simply the standard applicable income taxes under existing national law). It may not recognize cryptocurrencies as legal tender, restrict banks from processing cryptocurrency transactions, or impose onerous registration processes requiring users to obtain permission from the government prior to using cryptocurrencies, thus discouraging the use of cryptocurrencies.

**F** — A country does not allow its nationals to exchange hard currency for cryptocurrency and vice versa.



### Encourages Broadband

measures a country's number of mobile broadband subscriptions per 100 inhabitants (Metric A, using [International Telecommunications Union Data](#) indicator i911w), number of fixed broadband subscriptions per 100 inhabitants (Metric B, using [International Telecommunications Data](#) indicator i992b) and the mean download speeds of its internet connections (Metric C, using cable.co.uk's [Worldwide broadband speed league](#)). The three metrics are each weighted equally, and the combined scores are normalized.



## Encourages Global Tech Trade

considers five factors: Metric A, based on a country's participation in the Information Technology Agreement of 1997, according to the [World Trade Organization information](#); Metric B, a country's participation in the Information Technology Agreement of 2015, based on the [World Trade Organization Declaration on the Expansion of Trade in Information Technology Products](#); Metric C, the share of Information and Communication Technologies (ICT) as a percentage of a country's total exports and as a percentage of total imports (Metric D), both derived from the [United Nations Conference on Trade and Development](#) (UNCTADSTAT). Metrics C and D are normalized, and then all four measures are averaged and normalized again, producing letter grades. Metric E is based on the average applied most favored nation tariff rate for ICT products and is derived from [World Trade Organization tariff database](#).



## Encourages Telehealth

evaluates the extent to which a country permits care for its population by Telemedicine.

- A** — A country allows telehealth visits for a wide range of healthcare services to occur via videoconference or telephone, without requiring specific equipment to comply with telehealth regulations. In addition, the country must have no sunset clauses limiting how long telehealth services can remain operational.
- B** — A country allows telehealth visits, but places restrictions on the types of services allowed. It does not require specific equipment to comply with regulations (i.e. allows visits to occur over video call or phone). There are no sunset clauses limiting how long telehealth services can remain operational.
- C** — A country allows telehealth visits, but places restrictions on the types of services allowed and requires specific equipment to comply with regulations (i.e. physicians or patients cannot widely available videoconference services or phone calls for visits). The country may have a sunset clause

limiting how long telehealth service can remain operational.

- D** — A country allows limited telehealth services and requires specific equipment to carry out visits. It also has sunset clauses limiting how long telehealth services can remain operational.
- F** — A country does not allow telehealth services.



## Friendly to Digital Platforms

evaluates the degree to which a country enables people to use Web 2.0 technologies such as social media.

- A** — A country has enacted explicit rules indemnifying digital platforms such as social media and similar businesses against any potential liabilities introduced by individual users posting on them, and does not single out Very Large Online Platforms (VLOPs) or Very Large Online Search Engines (VLOSEs) for special regulation and/or enforcement.
- B** — A country indemnifies digital platforms and website operators by default from any liability resulting from content posted by individual users, though upon notice, they may be required to remove certain categories of content (e.g., content that constitutes defamation in the United Kingdom, expressions of Nazi ideology in Germany, etc.).
- C** — A country requires digital media platforms and website operators to cooperate with arbitrary government requests to remove content. The terms of such censorship are not explicitly or transparently defined, nor is such censorship limited by law, and the rules

are subject to change even in the absence of new legislation. Failure to comply with these regulations exposes companies operating digital platforms to liability.

**D** — A country singles out Very Large Online Platforms (VLOPs) and/or Very Large Online Search Engines (VLOSEs) for special regulation and/or enforcement.

**F** — A country bans certain digital platforms altogether.



### Fundamental Freedoms

evaluates the degree to which a country grants its citizens certain civil and political liberties. The grades are derived by equally weighting select components of [CATO Institute's Human Freedom Index](#) (to include freedom of movement; religious freedom; the freedoms of association, assembly and civil society; freedom of expression and information; and freedom of relationships), and scores from Freedom House's [Freedom in the World 2024](#). The combined scores are then normalized.



### Invests in Skilled Workforce

evaluates a country's population on the basis of educational attainment, availability of high-skilled workers, and the share of ICT-related advanced degrees. Metric A assesses the percentage of a country's population possessing a tertiary degree based on the [INSEAD Global Talent Competitiveness Index 2023](#). Metric B assesses the availability of scientists and engineers, based on an average score of a survey of business leaders, also using the [INSEAD Global Talent Competitiveness Index 2023](#). Metric C assesses the percentage of overall degrees institutions of higher learning confer in STEM-related disciplines, using the [WIPO Global Innovation Index](#). Each of these three metrics is normalized, and the scores are then combined into a composite, yielding a letter grade.



### Maintains Pro-Innovation Legal Environment

evaluates the health and fairness of a country's judicial institutions. This category draws on three metrics in the World Justice Project's [Rule of Law Index: Absence of Corruption](#) (Metric A), gauging absence of corruption in government; [Regulatory Enforcement](#) (Metric B), gauging the fairness and effectiveness with which a government implements and enforces regulations; and [Civil Justice](#) (Metric C), gauging whether ordinary people can resolve their grievances peacefully and effectively through the civil justice system. All three measures are then averaged and normalized, producing letter grades. Please note that Iceland, Israel, Saudi Arabia and Switzerland are not included in the WJP Index, so they consequently receive null grades in this category, which does not affect their overall performance on the Scorecard.



### Promotes Resilience & Digital Transparency

evaluates the extent to which a country's government provides services on the internet, enabling it to withstand shocks. The category encompasses a Resilience Score (Metric A, based on the [FM Global Resilience Index](#)) and an E-Government Development Score (Metric B, from the [UN E-Government Development Index, 2022](#)). The combined score is normalized.



### R&D Friendly

measures a country's gross expenditure on research and development, as a percentage of its GDP, using data from the [WIPO 2023 Global Innovation Index](#). The score is normalized and converted to a letter grade.



### Start-Up & Small Business Friendly

evaluates how easy it is to start a new business in a country. Metric A assigns quintile scores to Total Score from StartupBlink's [Global Startup Ecosystem Index 2024](#), which assesses countries on their ability to support new businesses. Metric B applies a normalized score based on the [World Bank's "Doing Business: Ease of Starting a Business" 2020 Corrected Data](#). Metric C grades nations on the number of unicorn companies (companies that have achieved an actual or implied valuation of at least US \$1 billion) founded domestically in the past 10 years per 10 million people in population, drawing on data from [Pitchbook](#), [CBInsights](#), [Crunchbase](#) and [Hurun Global Unicorn List](#). The unicorn metric is then converted into quintiles. Metrics A-C are then averaged, normalized and converted to a letter grade.



### Tax Friendly

evaluates the competitiveness of a country's tax system, based on its top federal corporate tax rate, and its top individual marginal tax rate. Metric A is based on [Tax Foundation Corporate Tax Rates 2023](#). Metric B is based on [PwC Personal Income Tax Rates 2024](#) and [Reuters](#) (Russia). The scores in each metric are normalized, combined into a composite, and converted to a letter grade.





## Welcomes Self-Driving Vehicles

evaluates the extent to which a country permits the testing and operation of self-driving vehicles on its public roads.

**A** — A country permits the operation of Level 4 SDVs, at least in some cases without a human driver, though it may impose restrictions, including restrictions on what zones SDVs may enter and what speeds they may reach.

**B** — A country permits the testing of Level 4 SDVs.

**C** — A country may or may not currently be testing any approved technologies at Level 4, but it either permits testing of such vehicles to a limited extent, or at minimum, does not explicitly prohibit them.

**D** — A country permits the testing of some partial self-driving technologies, but these technologies are below Level 4.

**F** — A country does not permit SDV testing.


Finally, a country loses two letter grades if it imposes serious restrictions and/or anti-competitive policies on the collection and use of data for the commercial development of SDVs, to include prohibitions on offshoring data.



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## Contact Info

 703.907.7600

 [scorecard@CTA.tech](mailto:scorecard@CTA.tech)

 1919 S. Eads Street, Arlington, VA 22202