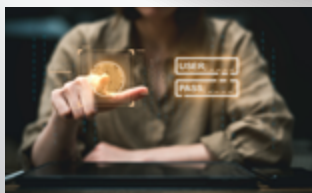




FUTURE TRENDS

Report

Issue no. 3 - October 2024



Future Trends Report

Future Trends Report, published in English and Arabic by TRENDS Virtual Office in Montreal, stands out as a distinctive publication dedicated to highlighting:

1. the most important forward-looking studies that aim to identify future trends, analyze various variables that may influence these trends, and determine the best future scenarios.
2. the most important applied studies that explore the application of knowledge, scientific theories, and information to solve current problems and overcome future challenges.
3. the most important illustrative and graphic forms that visually summarize significant studies, helping readers understand the trends and challenges of the future world.

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1 Prospective research

AI & warfare - the inevitable future?

Fatal equations – The lethal impact of algorithms in wars, Solveij Mailander, July 2024 - <https://farsight.cifs.dk/fatal-equations/>

The “disregard for thorough assessment and ethical consideration not only highlights the alarming dehumanization inherent in autonomous warfare, but also underscores the potential for – and exemplifies – the catastrophic consequences that can ensue when machines are entrusted with life-and-death decisions.”



Solveij Mailänder, a research fellow at Oxford University's Future of Humanity Institute, explores the ethical and societal implications of using Artificial Intelligence (AI) in warfare. Her July 2024 article examines the moral concerns surrounding AI by referencing a case study on the everyday use of ChatGPT. She highlights the discomfort that can arise from relying on AI for daily decisions, as illustrated by Maxwell Strachan's experience in "I Asked ChatGPT to Control My Life, and It Immediately Fell Apart" (Vice, 2023). Initially, outsourcing daily decisions to AI might seem harmless, but Mailänder delves into the more troubling ethical questions related to AI's role in warfare. She underscores the historical connection between the tech industry and the military, citing the example of companies like Anduril, which develop autonomous weapons systems. Anduril's AI-powered drones have led to significant contracts with the US military, highlighting the increasing use of AI in combat. Mailänder points to disturbing instances, such as the Israeli military's use of the 'Lavender' autonomous system in Gaza. This system, operating with minimal human oversight, has facilitated airstrikes that sometimes target individuals with imprecise ammunition, often harming civilians and their families. Such developments provoke serious concerns

about the moral implications of AI-driven decision-making in conflict zones. The article questions who should make critical decisions in warfare and critiques the growing detachment associated with AI. Historically, new technologies have transformed warfare, as seen with the use of drones in the Vietnam War. Mailänder notes that AI lacks the moral and emotional capabilities inherent to human decision-making. Critics argue that remote warfare, facilitated by AI, involves an emotional detachment that undermines the ethical considerations crucial to conflict.



As AI technology advances, Mailänder urges caution. While AI systems may evolve and become more capable, their decisions could have profound life-and-death consequences. The integration of AI in warfare demands careful consideration of the human element, questioning whether such decisions should be left to machines or remain under human control.



The Vietnam War served as a pivotal testing ground for American drone technology, which in turn led to a transition toward surveillance-focused operations and a subsequent adoption of the “electronic battlefield” approach.



In the early 2000s, with the onset of the War on Terror, weaponised drones started populating the skies, engaging in what soon would become termed “joystick warfare.”

A painless future

The painless future – August Leo Liljenberg, July 2024 - [/https://farsight.cifs.dk/the-painless-future](https://farsight.cifs.dk/the-painless-future)

In this article, the author reflects on our vision of pain, and its usefulness (or lack of it) in our lives. From the perseverance derived from it in the Christian religion to the four “noble truths” of Buddhism concerned with the repression of desire, suffering seems to be an integral part of our immutable realities. However, some believe that it is possible, and even necessary, to walk towards a new reality where suffering no longer exists.



The author refers to the work of philosopher David Pearce, in favor of an “abolitionist” project aimed at eliminating human suffering. The co-founder of the World Transhumanist Association (renamed Humanity+) is a fervent proponent of the idea of a “moral duty to eradicate all suffering via advanced biotechnology”. Pearce asserts that the abolition of all suffering would result in “civilizing the pleasure-pain axis and eventually turning it into a pleasure-super pleasure axis”. Critics of that project explain their argument by the usefulness of feeling pain, and give as an example patients with Congenital Sensitivity to Pain (CIP), for whom daily life is difficult, being deprived of the body’s mechanisms to protect itself from harm. As for Pearce, he blames “status-quo bias”, the idea that we’re stuck in a comfort zone rather than thinking about a future that’s light-years away from what our bodies feel daily.

The issue here is biotechnological developments, and how they might maximize the human experience of life. But doubts about these uses of recent biotech discoveries cannot erase the idea that “altering a law of nature is fundamentally wrong”. Other questions arise, such as the future of arts, if indeed it does sometimes depict suffering itself. Shall the abolitionist project see the light of day, will humanity find Shakespeare’s tragedies incomprehensible? Similarly, will the privileged elite have easier access to this “life without suffering”, thereby increasing inequality? In fact, the author even ends up likening Pearce’s theses to eugenics, which Pearce hastens to correct with a less negatively charged term: “genome reformist”. The article’s final question concerns death and the need for grievance when a loved one passes away. Should this become a hedonist experience?



“What does ‘abolishing suffering’ mean in practice?”



“500 or 5000 years from now, people will still be sitting around wondering why there is so much suffering in the world.”
David Pearce, philosopher and transhumanist, suffering-abolitionist

Prospective research

A view of the economic future - what will 2050 look like?

The long view - How will the global economic order change by 2050? - February 2017 - PwC. <https://www.pwc.com/gx/en/world-2050/assets/pwc-the-world-in-2050-full-report-feb-2017.pdf>

The report published by PwC in 2017 proposes to question the world's economic future between now and 2050, based on projections in terms of demographics, capital investment, education levels and technological progress. The report is aimed at a variety of audiences, from academics to policymakers, investors and economic commentators. Basing their projections in particular on the GDP estimates published in the International Monetary Fund's World Economic Outlook (October 2016), the authors attempt to sketch out the future trends of what the global economy will look like 25 years from now.



The GDP projections, for example, are based on the idea that global economic growth will be led primarily by the emerging market economies. The report predicts that economies like Mexico and Indonesia "are likely to be larger than the UK and France", while Nigeria could become the fastest growing African economy, if it diversifies its economy away from oil and strengthens its institutions and infrastructures.

While the authors predict that today's most advanced economies will remain in the lead in terms of average income, they also predict that emerging economies will make progress towards narrowing this gap between developed and emerging countries.

The value of this report also lies in the fact that it is aimed at policymakers, addressing certain challenges in maintaining sustainable growth. For example, the report details the major potential of certain economies, while laying down certain conditions, such as "sustained and effective investment in education, infrastructure and technology" (p.10). The authors also recommend that governments dedicate efforts to tackle climate change in order to maintain a long-term growth. Other challenges are described, such as demographic challenges like aging population. The example of Poland given

on p.44 is particularly striking, since it presents the case of a population which, according to the report, will decrease approximately by 0.4% per annum over the period to 2050, which will weaken the growth tremendously. Again, efforts towards more sustainable growth are needed, moving from generous social policy to innovation-based economic growth, based on government-led industrial and scientific initiatives.

Finally, the report concludes with advice for companies operating in emerging markets, developing strategies around operational efficiency, innovation and go-to-market excellence. These tips illustrate the optimism of PwC's report, which places confidence in governments and businesses alike to meet the challenges of the future.



"By 2050 we project China will be the largest economy in the world by a significant margin, while India could have edged past the US into second place and Indonesia have risen to fourth place." (p.3)



"By 2050, the E7 economies could have increased their share of world GDP from around 35% to almost 50%" (p.5)



Note for the designers: please note there are many interesting graphs in the report itself

Prospective research

The combat against organized crime – a two-year prospect

Stratégie 2024-2026 – De nouvelles façons de penser et d’agir – Global initiative against organized crime, February 2024, <https://globalinitiative.net/wp-content/uploads/2024/02//Strategie-2024%E2932026-%80%GI-TOC-Fevrier-2024.v1.pdf>

The Global Initiative Against Transnational Organized Crime (GI-TOC) is an international network of 600 experts founded in 2013, aimed at fostering debate and developing innovative strategies to combat organized crime globally. The February 2024 report outlines GI-TOC’s strategic plan for the next two years to tackle vulnerabilities created by organized crime and mitigate its impact on people, businesses, governments, and the environment.



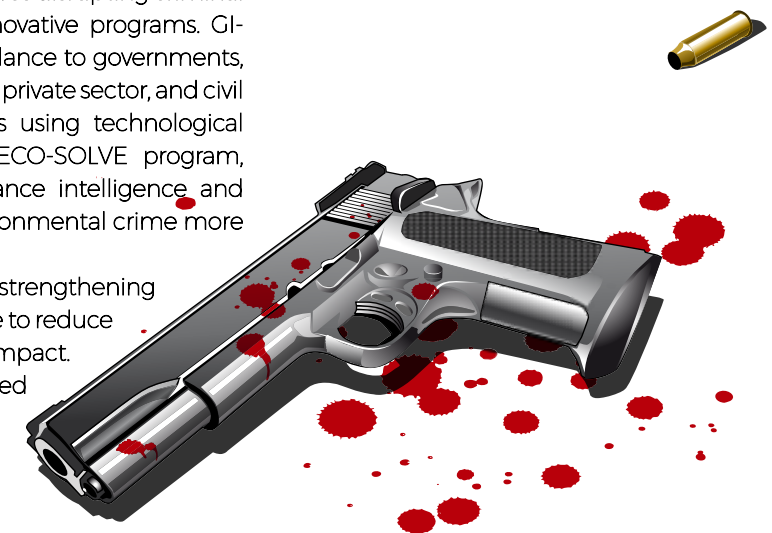
The report introduces GI-TOC’s “theory of change,” which focuses on reducing organized crime and its detrimental effects. It proposes four key areas of action: 1) enhancing analytical work and data; 2) disrupting criminal markets; 3) building resilience; and 4) creating inclusive action networks.

First, GI-TOC plans to improve analytical work by conducting research on illicit economies to better understand and respond to organized crime. This includes expanding publications based on the Global Organized Crime Index and addressing emerging crime types. Activities include raising awareness in regions like Central Asia and developing an online platform to share best practices in combating organized crime. The second area involves disrupting criminal markets through innovative programs. GI-TOC will provide guidance to governments, law enforcement, the private sector, and civil society. This includes using technological tools, such as the ECO-SOLVE program, which aims to enhance intelligence and data to combat environmental crime more effectively.

The third focus is on strengthening community resilience to reduce organized crime’s impact. GI-TOC has established a Resilience Fund

supporting individuals and groups in over 50 countries and plans to increase funding and develop tools for sharing experiences and strategies to enhance community resilience.

Additionally, GI-TOC aims to build global action networks, exemplified by proposed collaborations with UNODC and INTERPOL. This includes forming annual partnerships with private sector entities to strengthen global efforts against organized crime. Finally, the report emphasizes improving GI-TOC’s operational efficiency through an Enterprise Resource Planning (ERP) system for better integration of functions and project audits to enhance performance, with a focus on staff well-being.



GI-TOC’s theory of change focuses on four areas of action: 1) analytical work; 2) disrupting criminal markets; 3) building resilience; and 4) creating inclusive networks.



“Reducing organized crime and mitigating its negative impact on people, the environment, businesses and governments.”

Prospective research

What do young people think about war?

Anne Muxel, *Les jeunes et la guerre – Représentations et dispositions à l’engagement*, Étude 116, IRSEM, April 2024 - <https://www.irsem.fr/media/5-publications/etude-116-muxel-les-jeunes-et-la-guerre.pdf>

In April 2024, ISERM (Institut de Recherche Stratégique de l'École Militaire, France) published a study examining young people's perceptions of war. ISERM, affiliated with the French Ministry of the Armed Forces, conducts research on war, defense, and security. This study, based on a quantitative online survey of 2,301 French individuals aged 18 to 25, explores young people's knowledge of war, their concerns, future visions, risk perceptions, and willingness to engage.



The findings reveal that 52% of young people have an interest in military issues, though only 15% express strong interest. Interest varies by gender, with young men showing more interest than young women (21% vs. 10%). The study suggests that ideological orientation affects interest in war, with right-leaning ideologies often linked to greater military interest. Factors such as family influence, media consumption, and exposure to films, video games, and conspiracy theories also play a role in shaping interest.

For instance, a related survey of Sciences Po students found that 14% of this educated group believed that the 9/11 attacks were orchestrated by the CIA, not Osama Bin Laden. In contrast, 31% of the surveyed young people in the ISERM study supported this conspiracy theory, highlighting a significant portion of French youth still influenced by such beliefs over two decades after the events.

The study emphasizes that while young people are relatively informed about current conflicts, their views on war are shaped by various media and ideological influences. They recognize terrorism and biological weapons as major future threats but do not foresee new forms of warfare that deviate from traditional concepts.

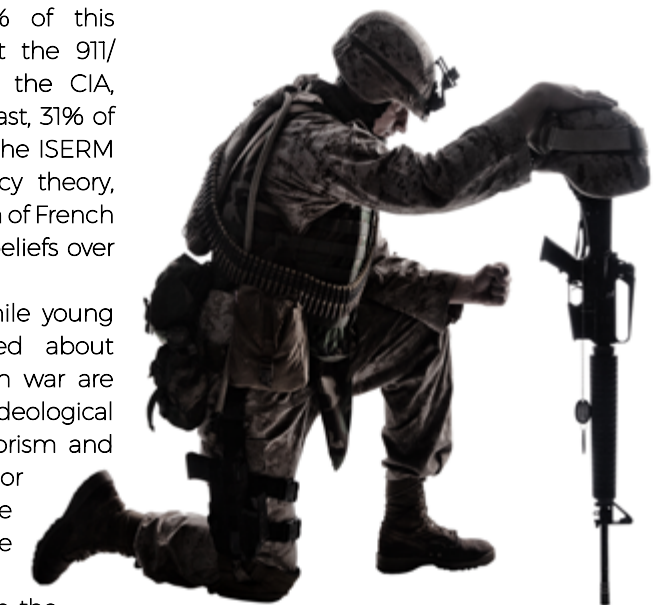
Overall, the study sheds light on the

complex ways in which young people understand and relate to war, influenced by ideological, familial, and media factors, and underscores the need for nuanced engagement with these issues.

To answer the initial research question, Muxel concludes that "young people are in a relationship of relative proximity with the military universe" (p.91), and that they would constitute a solid potential for resilience and support, in the event of a major conflict.



52% of young people have an interest in military issues, though only 15% express strong interest. Young men show more interest than young women (21% vs. 10%).



Young people would constitute a solid potential for resilience and support in the event of a major conflict.

Note for the designers: please note there are many interesting graphs in the report itself

2 Applied research

The future of cybersecurity: findings and insights

Cybersecurity Futures 2030 - World Economic Forum, 2023, https://www3.weforum.org/docs/WEF_Cybersecurity_Futures_2030_New_Foundations_2023.pdf

The Cybersecurity Future 2030 was published by the UC Berkeley Center for Long-Term Cybersecurity (CLTC), the World Economic Forum Centre for Cybersecurity and CNA's Institute for Public Research. The report brings together findings and insights, observations and variances to lay the groundwork for thinking about the strengths, weaknesses and objectives of cybersecurity in the years ahead.



“Cybersecurity will become less about protecting the confidentiality and availability of information and more about protecting its integrity and provenance.”

“Countries should form and strengthen trusted research institutions, particularly in less-developed economies, to support governments in addressing the most challenging social and technical cybersecurity problems of 2030.”

The first part is a collection of observations, based on the results of a series of in-depth workshops held in six international locations (Dubai, Washington DC, Kigali, New Delhi, Singapore and virtually in a few European countries), revealing the challenges, uncertainties and opportunities represented by today's cybersecurity landscape. Innovations in the world of technology are accelerating daily, both in a licit and illicit way. The increase in mis- and disinformation, the risk of cyber-attacks, the lack of trusted and expert regulatory bodies in some regions are all challenges with which decision-makers have to contend. Therefore, according to the authors

of this report, it is necessary to take advantage of the opportunities offered by the world of cybersecurity, such as the multiplication of public-private partnerships, the exchange of standard-setting processes between developing countries and those who have become 'trusted brands' in the field, or the strategic use of regulations designed to guard against the downsides of AI products. The findings of this report will greatly help decision-makers (government, industry, academia and civil society) to understand the risks and challenges posed by cybersecurity and take initiative to mitigate the risks and securely harness the technological progress.

Applied research

Topic models in applied settings: encoding knowledge through direct iterative refinement

Gao, Sally, Milda Norkute, and Abhinav Agrawal. "Evaluating Interactive Topic Models in Applied Settings." In *Extended Abstracts of the CHI Conference on Human Factors*

This paper, written by three members of the Thomson Reuters Labs, a content-driven technology company who curates and classifies data to support professionals, is a case study designed to "assess the impact of human refinement on model interpretability and predictive performance in collaboration with an analytics team" within their organization. More specifically, the authors question the usefulness of an interactive topic model, a statistical modelling technique, which would enable non-expert users to "encode their knowledge (...) through direct iterative refinement." Human-in-the-loop topic modeling (HLTM) enables users to create their own topic models, thus ensuring a custom-built interface that is supposed to facilitate performance.



"Topic modeling is a text analysis technique for automatically discovering common themes in a collection of documents." (p.1)

The research is based on responses to an employee satisfaction survey, conducted between 2022 and 2024, among Thomson Reuters employees, with the main objective of understanding whether a custom-built HLTM solution would better serve the employees, by providing human feedback, identifying issues more rapidly, and creating an interactive setting. It should be noted here that, until this study, HLTM research had only been carried out in experimental environments, far from the "real-world applied settings" that this case study represents. The study concludes on a positive note, since the users questioned were enthusiastic about the HLTM tool. However, the value of this research also lies in the fact that the

authors recommend ways forward for improving topic modelling. Indeed, the project identified weaknesses and gaps that need to be addressed in order to improve the tool going forward. For example, issues of performance (such as being able to "assign appropriate topics to future documents") or interpretability (i.e. making topics meaningful to end users) must be among the priorities in improving the HLTM tool. In addition, the authors suggest that, moving forward, we need to find ways to improve users' understanding of the tool and decisions around documents, and "help users validate that the model is behaving according to their intentions during refinement" (p.7).



We need to improve users' understanding of the tool and decisions around documents, and help them validate that the model is behaving according to their intentions during refinement.

Applied research

Research and public health: a need for the future

McLaren, L., Braitstein, P., Buckeridge, D., Contandriopoulos, D., Creatore, M. I., Faulkner, G., & Smylie, J. (2019).

Why public health matters today and tomorrow: the role of applied public health research. Canadian Journal of Public Health, 110, 317- 322.

The authors of this article published in 2019, all researchers at the Applied Public Health Chair (APHC), a "program designed to support innovation in population health research that improves health equity for citizens in Canada and around the world", reflect together on efforts that could be made to strengthen public health in Canada and globally.



The proposals made here are based on applied research, enabled by APHC's program focused on "interdisciplinary collaborations and mentoring of researchers and decision-makers in health and other sectors." Research themes include healthy public policy, supportive environments, diverse methodological approaches, global health and health equity (p.318).

For the authors, applied public health research rests on three fundamental principles that intertwine, support and reinforce each other: sustainability (in the approach of public health), equity (i.e. a "worldview concerned with the systemic drivers of unfair distributions of health-damaging experiences") and effectiveness (in the impacts for the populations' wellbeing). In order to ensure that these three pillars are solid, it is first necessary to ensure the researcher's complete autonomy. Defined as "the capacity to devote time and energy to activities that, at the researcher's discretion, facilitate research that embraces principles of sustainability, effectiveness and equity" (p.320), autonomy enables the researcher to navigate freely between institutions, governments, communities and any other actors and sectors that might have an impact on public health.

Furthermore, the authors argue that applied research can only succeed if

funding is available to support cross-sectoral research programs. By increasing funding competitions, researchers could open their networks, and increase knowledge co-creation, as well as knowledge transfer. Partnerships should also be a key priority, as they enable researchers to gain skills and experience to navigate the contexts in which they intervene.

"A robust applied public health research community requires sustained funding to support foundations of a credible and internationally-competitive research program."



"Public health is critical to a healthy, fair, and sustainable society."



Autonomy enables the researcher to navigate freely between institutions, governments, communities and any other actors and sectors that might have an impact on public health



Applied research

Empowering women through education

Jaysawal, N., & Saha, S. (2023). Role of education in women empowerment. *International Journal of Applied Research*, 9(4), 0813-.

The authors of this paper, both professors in the Department of Social Work at Visva-Bharati (West Bengal, India), discuss the different ways in which education can increase women's empowerment today. Defined as "the process of enabling or authorizing individual to think, take action and control work in an autonomous way (Bhat, 2015; Kaur, 2018), empowerment implies liberation from oppression, as well as the reconfiguration of a variety of social and economic relationships.



Here, the authors present the results of a study based on a descriptive research design, through data collected from secondary sources, analyzed using meta-analyses, systematic reviews and literature reviews. Following a review of the evolution of women's education in India, the article focuses on the role of education in women's empowerment. The beneficial effects of education are described here as effectively empowering, at several levels: socio-cultural, economic, interpersonal, legal, political and psychological. Therefore, investing in education should be a priority, as it impacts not only individuals but also the nation.

The researchers present the various ways in which education can strengthen women, for example through their participation in public affairs. Acquiring knowledge will boost women's self-confidence and enable them to "resist all forms of exploitation" (p.10). As far as financial independence is concerned, empowering women will enable them to secure a better

income, plan their finances and feel less dependent. Psychological empowerment must also be a priority, as it enables women to regain their sense of self, reduce isolation and feel more in control of their lives. In conclusion, the authors point out that, despite their country's independence, it seems that women remain in a position of inequality on many levels. Education must eradicate gender stereotypes, and increase women's chances of achieving a more comfortable, less dependent and freer standard of living.



"If you educate a man, you educate an individual, however, if you educate a woman you educate a whole family."
Nehru.



Education must eradicate gender stereotypes, and increase women's chances of achieving a more comfortable, less dependent and freer standard of living.

Bhat RA. Role of Education in the Empowerment of Women in India. *Journal of Education and Practice*. 2015;6(10):188192-

Kaur J. Role of Education in Women Empowerment in India. *International Journal of Social Science and Economic Research*. 2018;3(12):74667472-.

Migration of skilled professionals: brain drain or brain gain?

Bhardwaj, B., & Sharma, D. (2023). Migration of skilled professionals across the border: Brain drain or brain gain? European Management Journal, 41(6), 1021- 1033.

This article reviews the literature on skilled migration, brain gain and brain drain. The 75 studies synthesized here respond to a lack of recent research on theorizing the causes as well as the outcomes of migration. Economic migration is not the only explanation for brain drain. "A national-level environment, adequate rules, strong property rights and research infrastructures may all play a role" (p.1022). The authors, members of HPKV Business School (Central University of Himachal Pradesh, India) attempt to answer here the enablers of migration for skilled professional, as well as the negative and positive outcomes of this drastic decision.



First, the authors explain how they have attempted to approach the cross-border migration of skilled professionals such as scientists, doctors and engineers from a behavioral perspective. To do this, they used Maslow's hierarchy of needs (1948) and Herzberg's theories (1968). Using key words and exclusion criteria, the authors selected articles from the Scopus database, focusing on studies dealing with the drivers of migration (brain drain or brain gain). While neoclassical macroeconomic theory (research of a higher income) and microeconomics (cost-benefit analysis) have been used, the theory of new economies challenges the presumptions suggested until now. According to this theory, the decision to migrate is based above all on "better prospects and opportunities for families". The most recent research stresses the "human resource aspects", and not just the economic aspect. Maslow's hierarchy helps the authors to identify that, while professionals used to migrate in search of a better source of income,

they now migrate in order to meet their "higher-order motivational needs", namely self-actualization and self-esteem (Maslow, 1943). Other factors, such as "technological advancement, standard of living, and quality of work life" are presented here.



Finally, the authors conclude by questioning the theories that would suggest that skilled migration necessarily results in a brain drain for the country of emigration, and a brain gain for the country of immigration. According to Bhardwaj and Sharma, the impact of skilled migration is bidirectional, naming just a few of the paybacks it represents (investment and trade flows, technology transfer, remittances, charitable activities).

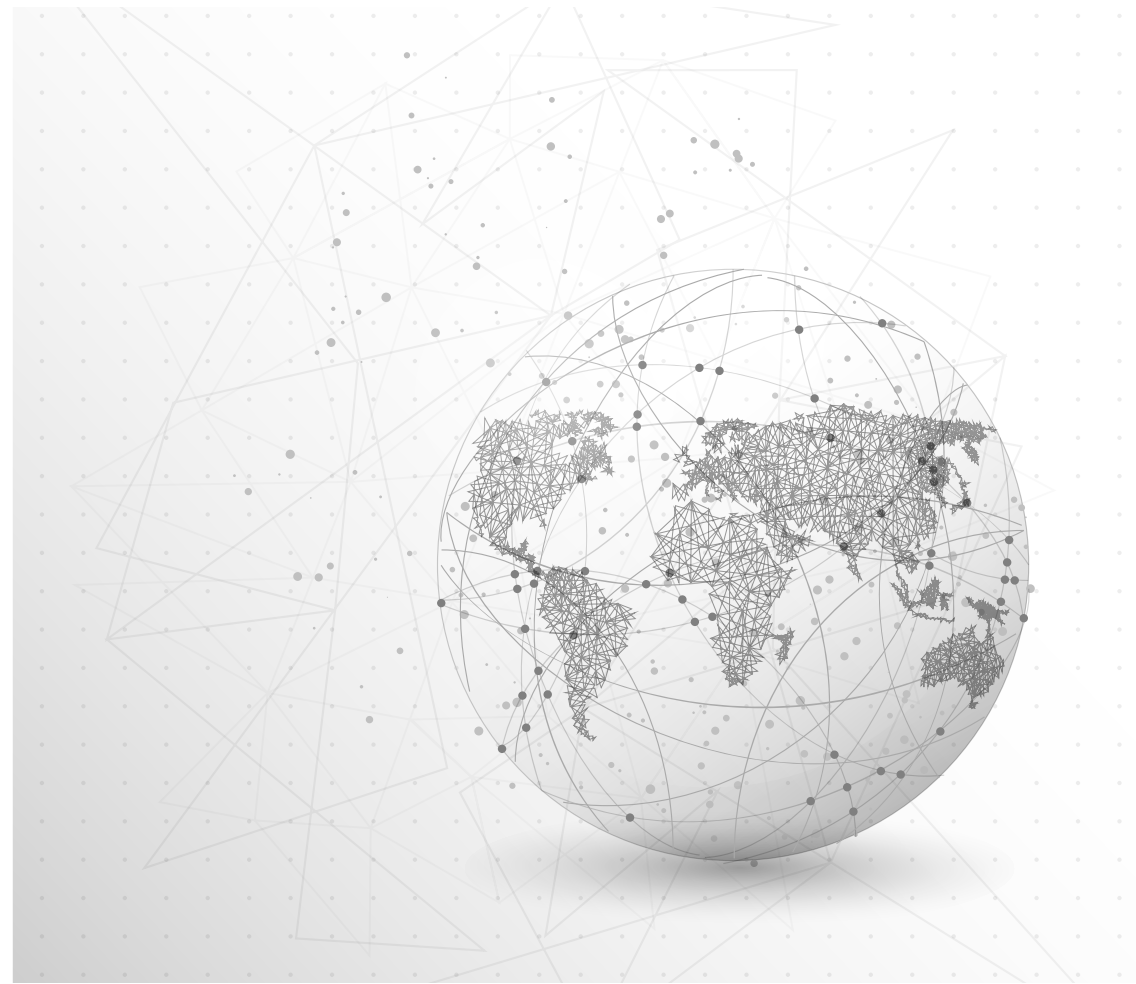
Herzberg, F. (1968). One more time: How do you motivate employees (Vol. 65). Boston, MA: Harvard Business Review.
 Maslow, A. H. (1943). A theory of human motivation. Psychological Review google schola, 2, 2128-.

"A national-level environment, adequate rules, strong property rights and research infrastructures may all play a role."

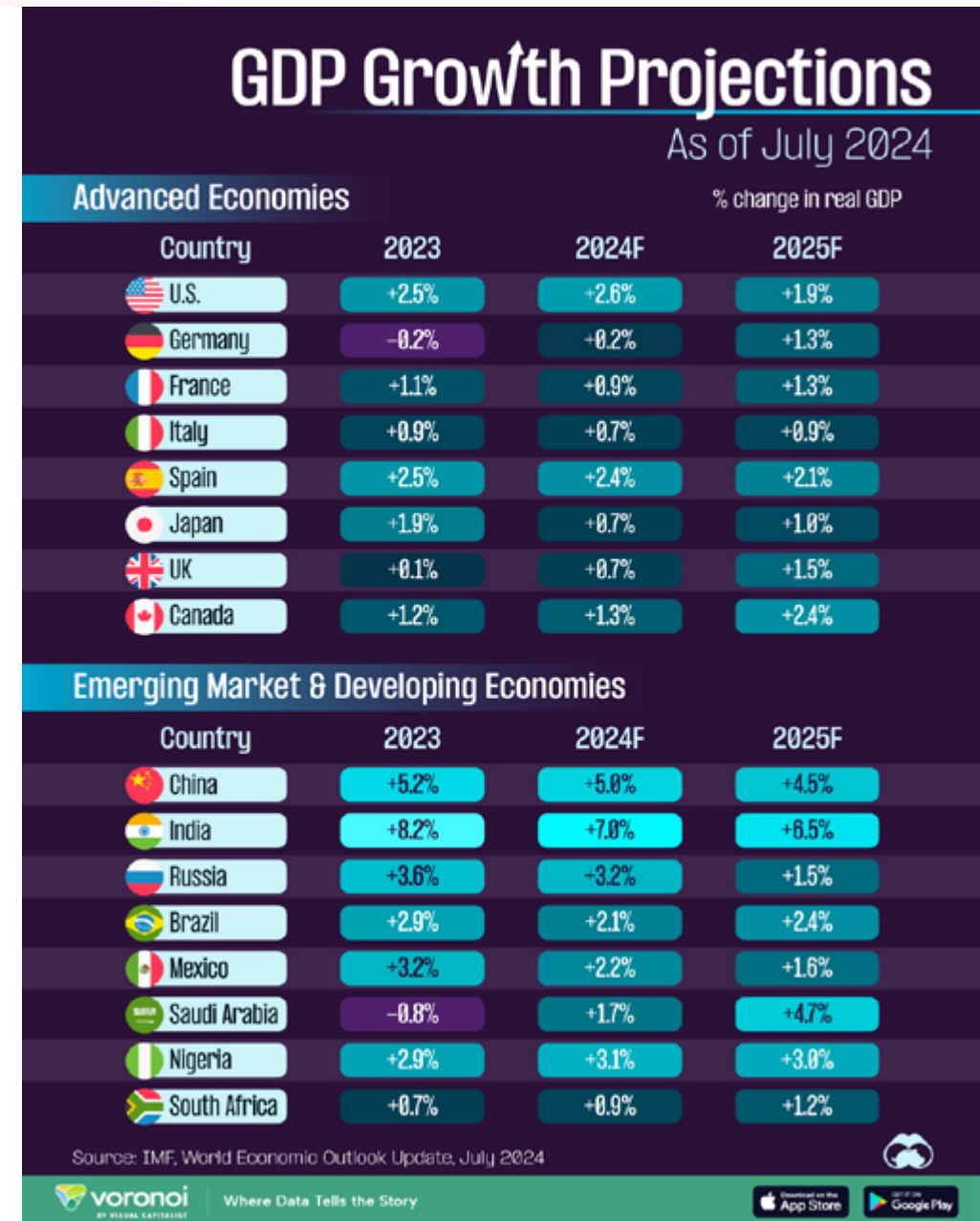


According to the UN, nearly 3.25 percent of people worldwide reside outside of their country of birth, and one of the primary reasons for this is employment (UN, 2016).

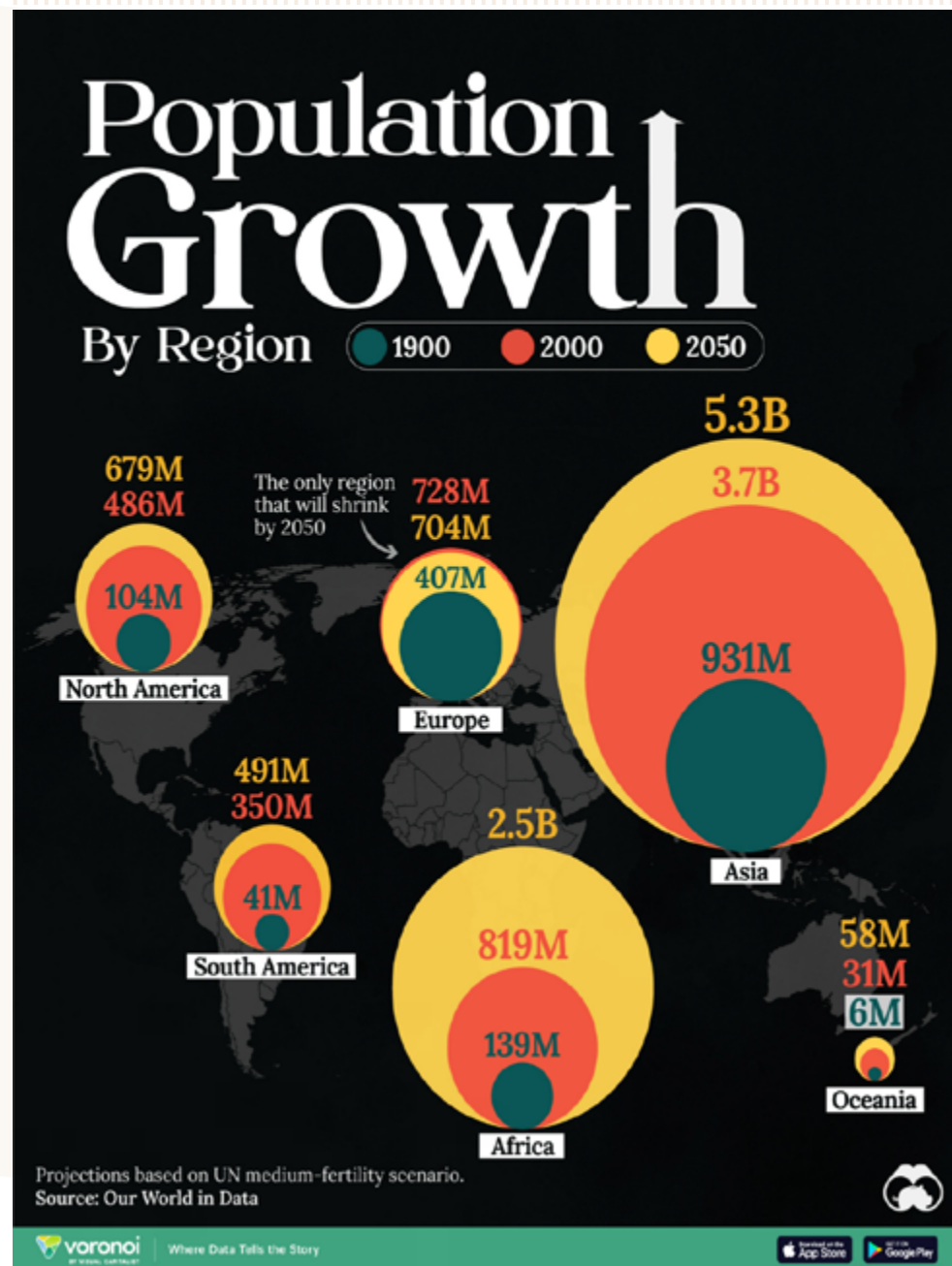
3 The future in numbers



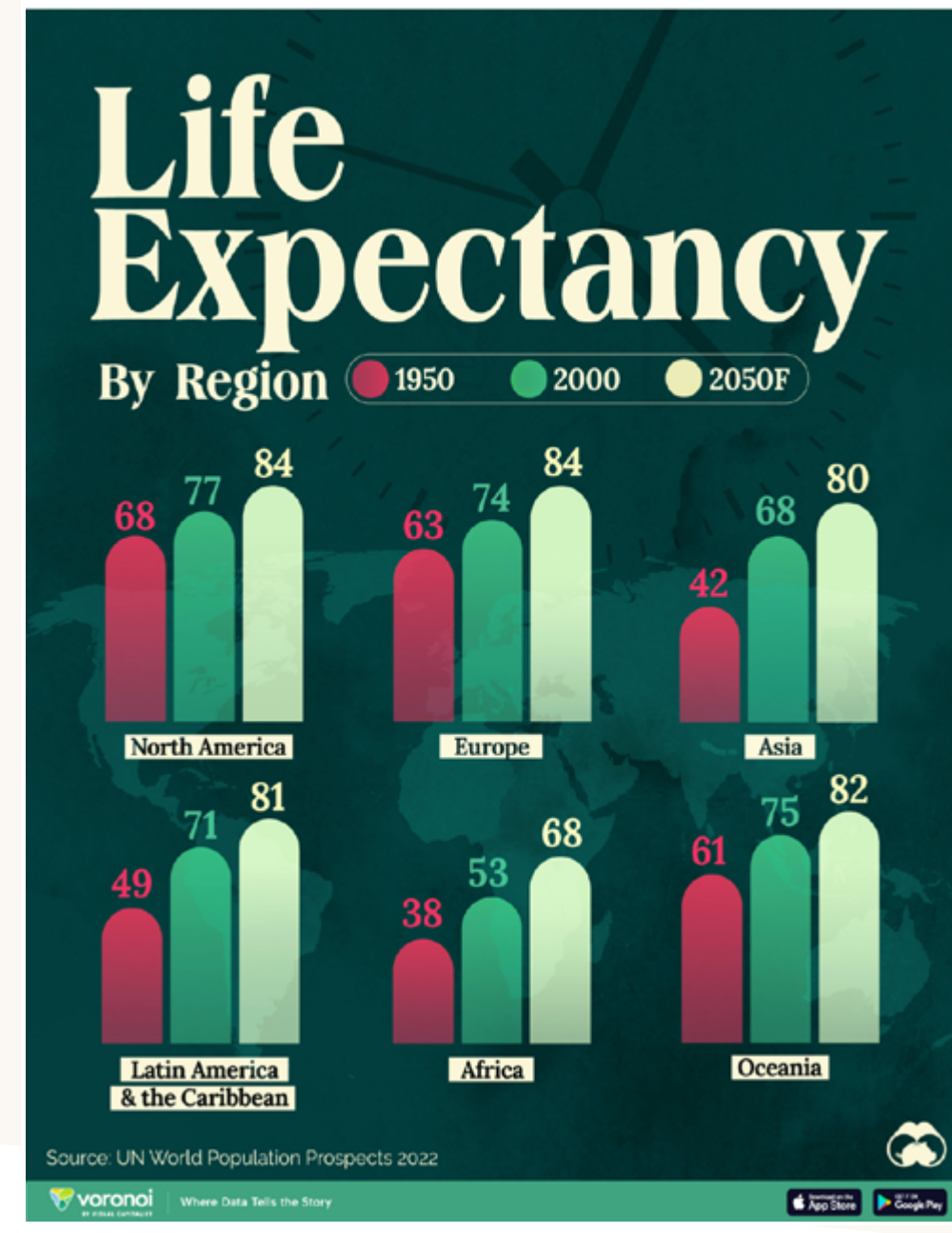
GDP Growth Projections for Key Economies (2024-2025)



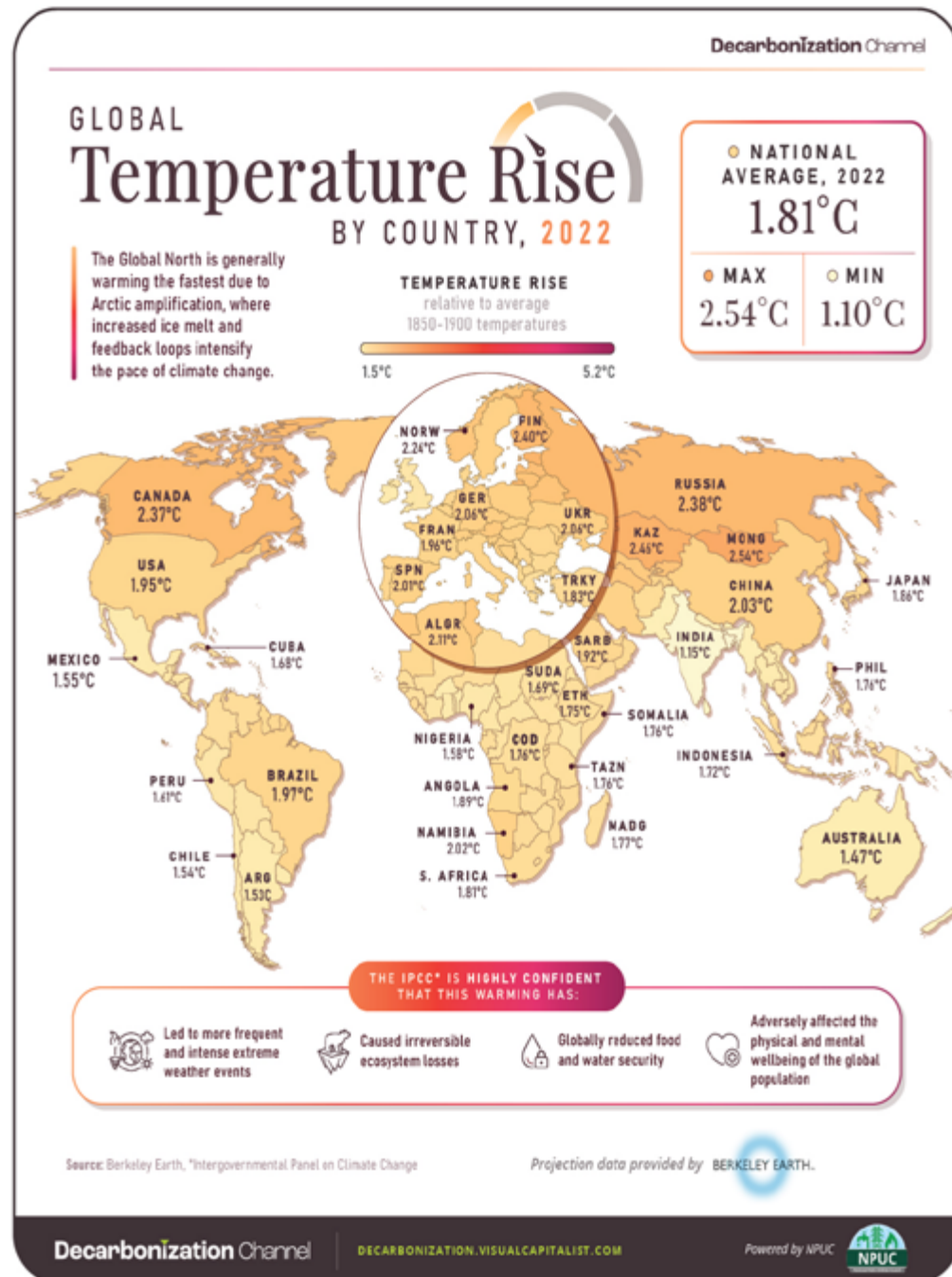
Population Growth by Region (1900-2050)



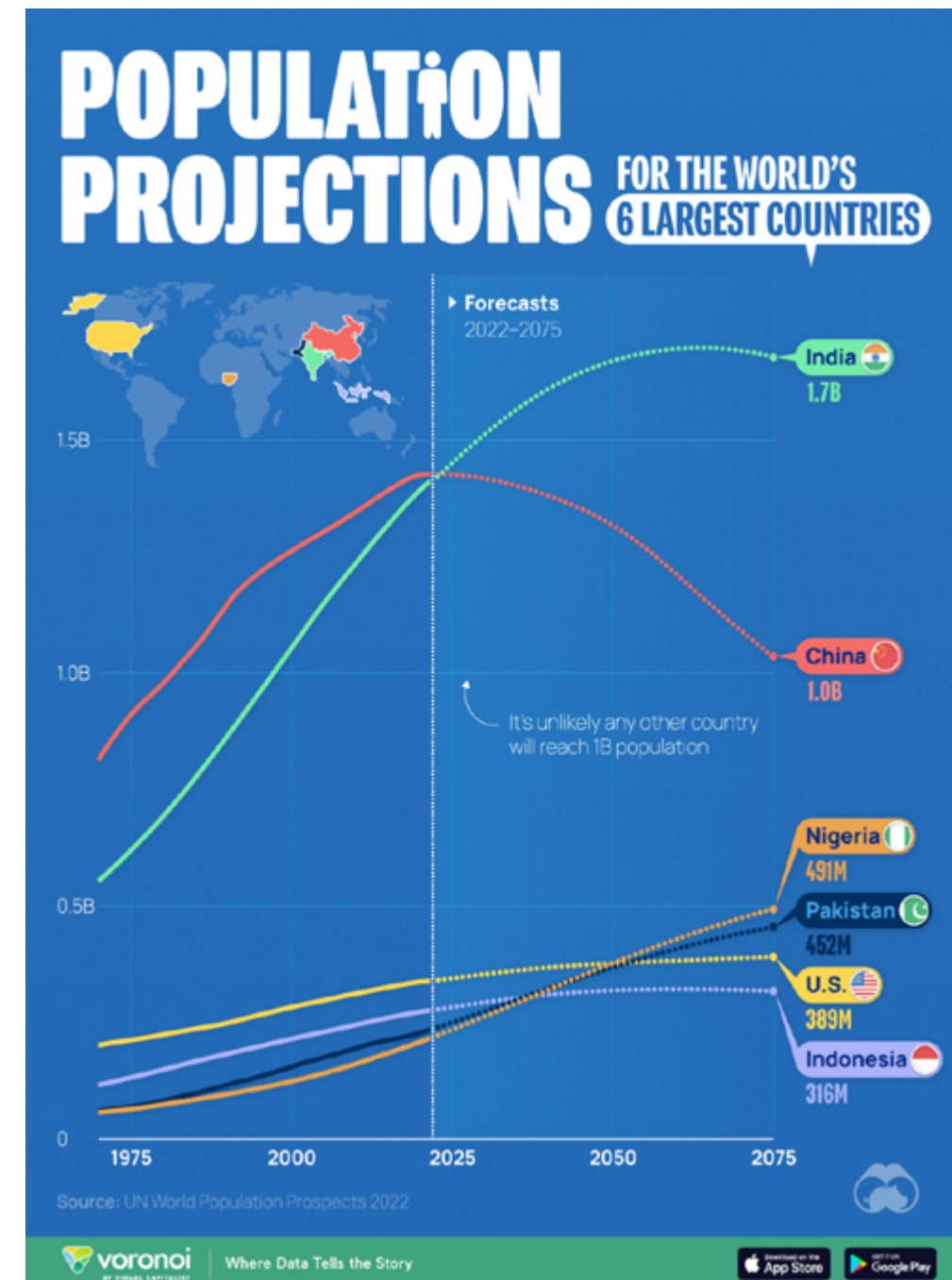
Life Expectancy by Region (1950-2050)



Global Temperature Rise by Country (2022-2100)



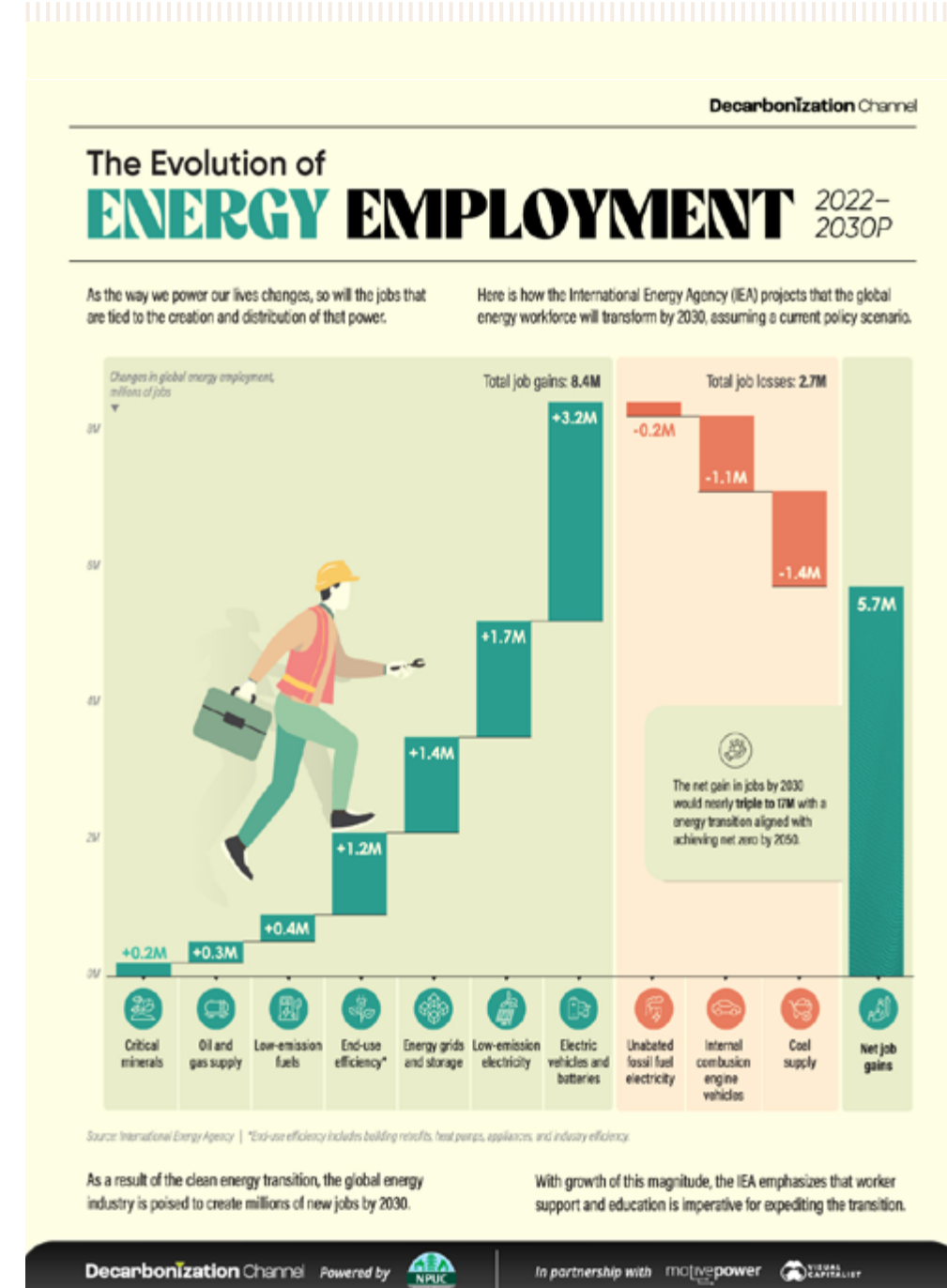
The World's 6 Largest Countries in 2075



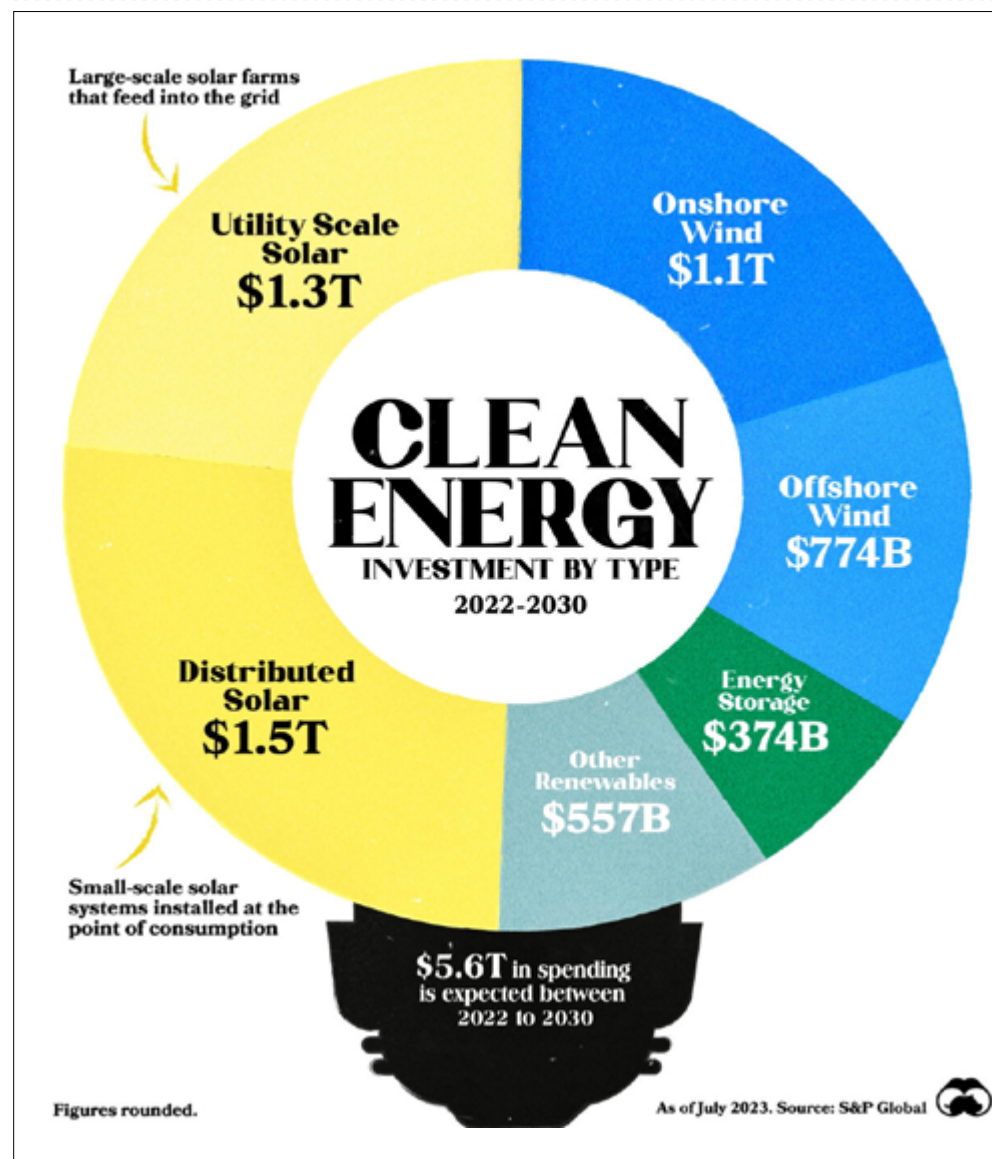
The Top Economies in the World (1980-2075)



The Evolution of Energy Employment (2022-2030)



Global Clean Energy Spending Forecasts (2022-2030)



Pallavi Rao, Ranked: The 25 Poorest Countries by GDP per Capita, Visual Capitalist, March 29, 2023, <https://www.visualcapitalist.com/worlds-poorest-countries-2023-gdp-per-capita/>

China's Aging Population (1950-2100)

Year	60+ Population	% of Total Population
1980	74,899,385	7.5%
2000	129,460,648	10.0%
2021	258,371,810	17.9%
2050	485,489,066	34.6%
2070	454,270,458	36.1%
2100	402,780,972	37.8%

<https://www.visualcapitalist.com/cp/chinas-aging-population-problem-19502100-/>