

Luxembourg

Archetype **High-trust diffusers**

GDP / person **\$147k**

Population **0.69M**

10-yr trend **1.9%**

Gradual **11.3%** · #39

Fast **14.6%** · #49

WHERE LUXEMBOURG STARTS

Luxembourg is a high-trust diffuser: rich, highly skilled and fast to absorb AI. The scores show why it belongs. AI diffusion capacity is 4.1, language inclusion 4.6, cyber resilience 4.2 and climate resilience 4.7. Demographics and migration score 4.6, far above the archetype's typical 2, because Luxembourg draws its workforce from across its borders. Roughly half its workers commute in daily from France, Belgium and Germany. At about \$147,252 per person, it is one of the world's richest economies. Its concrete strengths are real: the world's second-largest investment fund center, the European Court of Justice and European Investment Bank, the satellite operator SES, and the LuxConnect data centers. The constraints are just as clear. Compute and energy access is 1.7, physical build speed 1.3 and catch-up headroom 1.2. Ten-year trend growth is 1.9% a year.

THE THREE PATHS

These are simulations, not forecasts. The Modest path is the baseline; the two AGI scenarios fork from it. Under the **Modest** scenario, AI stays a normal technology. Luxembourg would gain a small lift on trend: 2.2% growth a year, 106th of 157. Its fund industry and digital services would absorb AI at the margin. Under **Gradual** takeoff, growth would climb for two decades and reach 11.3% a year once AGI matures around 2045. That would place Luxembourg 39th in the world. An economy growing at 11.3% doubles in about six and a half years. The long runway would let it turn skills, openness and financial depth into hosted AI services. Under **Fast** takeoff, growth would reach 14.6% a year from the early 2030s, a doubling roughly every five years. But its rank would slip to 49th, ten places lower, because a fast world rewards the compute and frontier access Luxembourg does not hold. Politics could slow or redirect any of these paths. How Luxembourgers and their government respond to transformative AI is a variable the model holds constant.

HOW YOU WOULD KNOW WHICH WORLD YOU ARE IN

The three scenarios look almost the same until about 2030. So watch leading indicators, not GDP, and watch them live. Three global signals matter most. First, whether the METR task-horizon curve keeps doubling every four to five months through 2027–28; METR publishes it at metr.org. Second, whether frontier-lab revenue and capital spending keep compounding; Epoch AI tracks both at epoch.ai. Third, whether growth in the ten to twenty most-ready economies — the United States and China above all — breaks above trend in the early 2030s. Double-digit growth there within a couple of years of 2030 would signal a fast world. A point or two above trend by the mid-2030s would signal a gradual one. A fade back to trend would signal a modest one. Luxembourg's own signals would

arrive earlier: AI adoption and order books in the funds and banking sector, financial close and construction on data-center sites such as Google's planned Bissen project, and rules from the CSSF regulator that let AI operate inside regulated finance.

IF GROWTH GOES EXPLOSIVE

Explosive is relative. At 11.3% growth a year, Luxembourg would run at about its region's median of 10.4%, but well behind the frontier compounding at 19.5%. This would be catch-up against its own history, not explosive by world standards. The economy would double roughly every six and a half years. Financial services would deepen and hosted AI and digital services would grow alongside them. Luxembourg is an immigration country, so there is no emigration to reverse. Faster growth would raise labor demand and wages, drawing still more cross-border workers into the economy. There is a way this leaves Luxembourg worse off, and it is worth naming. It would rent its compute rather than own it, and sit as a rule-taker inside another power's chip regime. Europe hosts about 8% of tracked training compute and none of the leading labs. If alliance access narrowed or open-weight models fell far behind the frontier, its financial and digital edge could be repriced or throttled by decisions made abroad. The hedge is to secure sovereign or European capacity and diversify suppliers. Even then, the pace-setter would shift to the state, testing how fast the CSSF, permitting bodies, courts and a small civil service can approve, adjudicate and count.

WHAT LUXEMBOURG CAN DO NOW

Three levers follow from the scores, and two pay off whether or not AGI arrives. The first is physical build speed, low at 1.3. Statutory shot-clocks, one-stop approvals and grid built ahead of demand are no-regret moves; slow permitting hurts a small, land-scarce economy in any world. The second is protecting openness and absorptive capacity, the substance behind the 1.2 catch-up score. Luxembourg is already open to trade, FDI and technology transfer, and its institutions are strong; the no-regret task is to defend that edge, not rebuild it. The third lever is the bet. Compute and energy access, at 1.7, carries the most weight of all under a fast takeoff but barely moves growth if AI stays ordinary. Closing it means packaging power, land and fast permits to anchor hyperscale investment, and securing chip access through alliances. Singapore, an archetype peer that is also small and energy-constrained, published a Green Data Centre Roadmap in 2024 that added capacity paired with clean-power and efficiency rules. A cautious government can act on the two no-regret levers today and lose nothing if the skeptics are right. To see how moving any of these scores changes Luxembourg's path under each scenario, open the atlas's [policy editor](#).

The three levers — and which pay off regardless

Catch-up headroom

score 1.2 / 5 · weight 16 under skeptic → 6 under fast takeoff

Counts under the Modest scenario too (16→6). Closing this gap pays off whether or not AGI arrives.

No-regret

Compute & energy access

score 1.7 / 5 · weight 8 under skeptic → 24 under fast takeoff

Weight climbs from 8 to 24 as takeoff nears. It barely moves growth if AI stays ordinary — the lever that needs a view on the takeoff.

AGI bet

Physical build speed

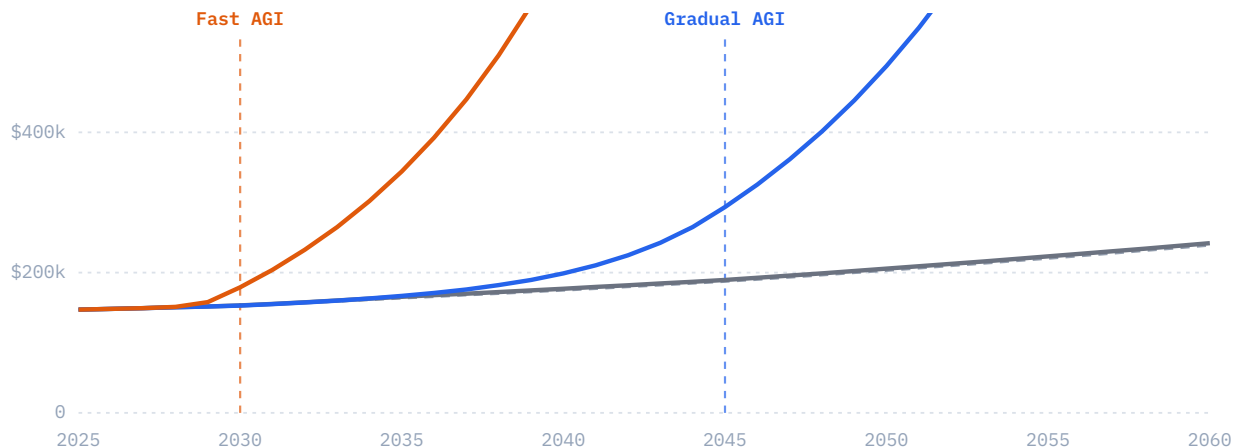
score 1.3 / 5 · weight 8 under skeptic → 17 under fast takeoff

Weight climbs from 8 to 17 as takeoff nears. It barely moves growth if AI stays ordinary — the lever that needs a view on the takeoff.

AGI bet

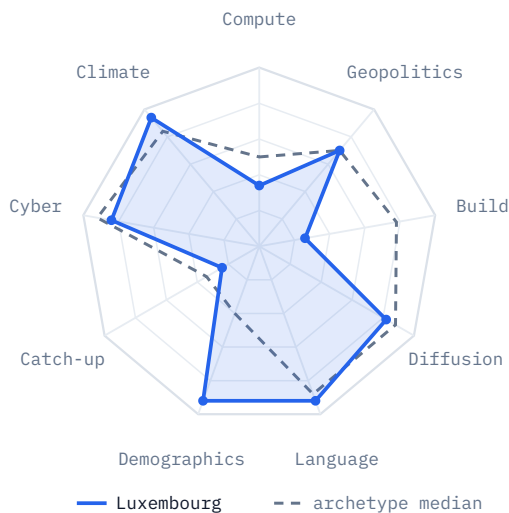
The no-regret levers pay off in every scenario, so a cautious government can act on them today. The AGI bets become decisive only if takeoff is real.

GDP per person to 2060, by scenario



Linear scale; solid lines are the three scenarios, dashed grey the no-AI baseline. Growth ramps from 2027 to each scenario's rate at its AGI year (Fast ~2030, Gradual ~2045), then holds. Timing and divergence are the point, not end levels; steep paths exit the top of the capped axis.

The nine factors



Solid: Luxembourg. Dashed: the median of its archetype. Scores are relative to the other 156 countries (3 ≈ global median, 5 = leading today).

Outcomes under each scenario

SCENARIO	GROWTH / YR	WORLD RANK	INDEX	DOUBLING
Modest	2.2%	106 / 157	66.5	—
Gradual	11.3%	39 / 157	62.8	6.5 yrs
Fast	14.6%	49 / 157	58.4	5.1 yrs

Post-AGI growth rate, rank among 157 countries, AGI Growth Index (0–100, scenario-weighted), and the implied economy doubling time. The Modest path is the baseline the AGI scenarios fork from.

THE THREE SCENARIOS

Modest the Acemoglu view

AI as a normal productivity tool

Intelligence was never the binding constraint on growth, so AI delivers real but ordinary gains. Each country gets a one-time boost of a couple of percent of GDP, phased in through 2035; growth then returns to trend. The mainstream-economics view.

≤0.66% TFP over a decade — a one-time gain

Luxembourg: 2.2% growth a year · #106 of 157

Gradual Erdil & Besiroglu, base case

Broad automation, on a long timeline

Broad automation of remote work arrives around 2045, with gains building slowly from the late 2020s. Growth then reaches up to ~20% a year for the best-positioned countries — ten times today's frontier trend. A slow arrival gives countries time to adapt, so the gains are wide but uneven.

up to ~20%/yr after 2045 — 10× the frontier trend

Luxembourg: 11.3% growth a year · #39 of 157

Fast Erdil & Besiroglu, fast takeoff

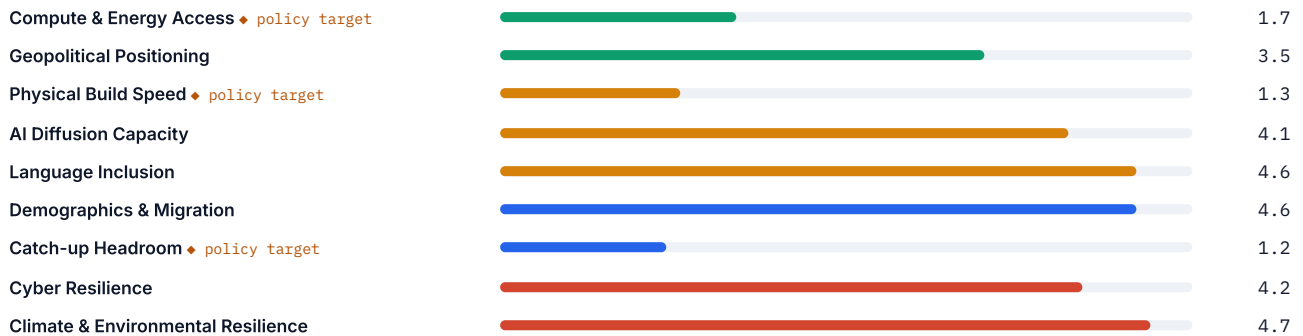
Fast takeoff — today's infrastructure decides

Transformation lands around 2030, before countries can adjust. Whoever already owns compute, capital and the ability to build wins; the gap between countries widens dramatically — and some are left growing slower than they would have without AGI.

up to ~40%/yr from 2030

Luxembourg: 14.6% growth a year · #49 of 157

Factor scores — and where policy bites



♦ marks this country's highest-leverage policy targets: the weakest factors carrying the most weight under the AGI scenarios. The atlas's interactive policy editor (agigrowth.org/#editor) simulates how raising any score changes growth under each scenario.

Archetype: High-trust diffusers

Rich, skilled and quick to absorb AI — including the big aging economies whose adoption outweighs their demographics.

Wins: The diffusion era — every year before full automation compounds their head start.

Watch: Little frontier capability of their own: dependent on alliance access and open weights; slow to build.

Canada 18.3% · #3	Ireland 17.4% · #4	United Kingdom 16.9% · #5	Australia 16.1% · #6	Singapore 15.7% · #7
New Zealand 15.5% · #9	Sweden 15.1% · #12	Norway 14.7% · #14	Germany 14.5% · #17	Switzerland 14.3% · #18

The regional picture — Rich, capable — and dependent on someone else's frontier.

Europe has the world's densest cluster of high-trust absorbers: strong institutions, high measured adoption, deep skills. What it does not have is a frontier. The entire continent hosts about 8% of tracked training compute — a tenth of the American share — and none of the leading labs. That makes Europe's position derivative in a way its wealth conceals: its access to frontier capability rests on continued alliance inclusion under the US AI umbrella (most of the continent sat in Tier 1 of the 2025 diffusion framework) and on open-weight models remaining available not far behind the frontier. Neither is guaranteed across twenty years, and the hedge — building sovereign European capability — collides with the region's domestic constraints: high energy prices, slow permitting, and workforces aging from Lisbon to Warsaw. The UK and Ireland lead on absorption; Central Europe is building real manufacturing capacity; the Balkans and Moldova trail on institutions; Ukraine remains a war economy. Given AGI, Europe's internal spread is already wide — and the gap between absorbing AI and owning any part of it is the region's defining exposure.

Method, in brief

Each country is scored 1–5 on nine factors from public data (World Bank, Epoch AI, ITU, IMF and national sources). A scenario-weighted average forms the AGI Growth Index (0–100), which maps to a post-AGI growth rate inside ceilings derived from Erdil & Besiroglu (2023): ~20% growth a year for the best-positioned country under Gradual takeoff (AGI ~2045), ~40% under Fast (AGI ~2030); growth ramps convexly from 2027. The scenario sets the growth rates on offer; the index only decides where each country sits within them. The Modest scenario is the skeptics' baseline — a small uplift on each country's own ten-year trend. These are simulations for structured thinking, not forecasts; no probabilities are attached to any scenario.

Watch the global signals live: the METR task-horizon curve at metr.org/time-horizons · frontier-lab revenue at epoch.ai/ai-companies · AI-chip spending at epoch.ai/ai-chip-sales.

Explore further: full methodology agigrowth.org/#methodology · map & rankings agigrowth.org/#explore · country profiles agigrowth.org/#countries · policy editor agigrowth.org/#editor