The Growth Story of the 21st Century: The Economics and Opportunity of Climate Action

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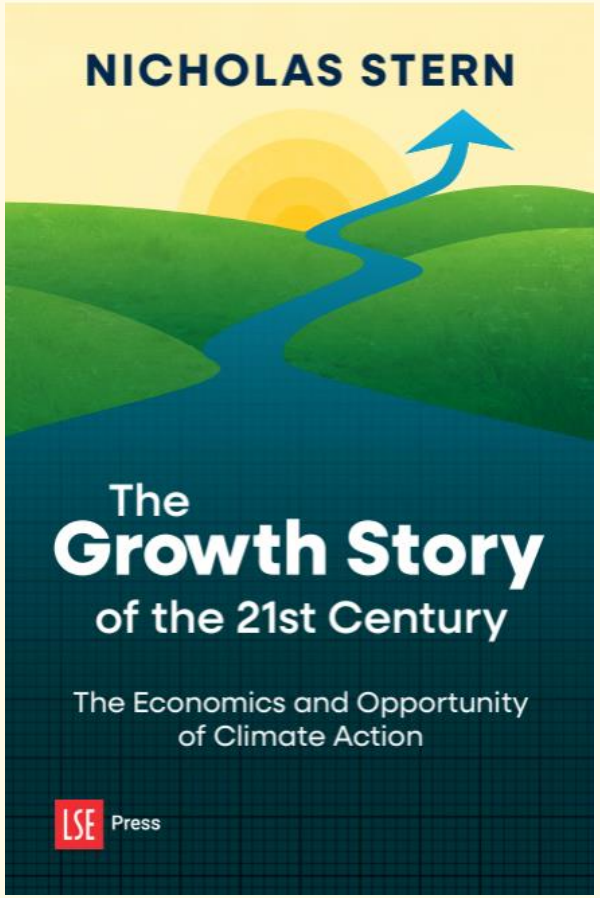
The slides provide a brief summary of the main arguments of the book. They are more detailed than the presentation.



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The argument of the book: the imperative and the opportunity

The science is ever more worrying.

The next two decades are critical if we are to avoid catastrophic environmental conditions across much of the world.

The technology is advancing rapidly.

We now have extraordinary opportunities in our hands.

Avoiding catastrophe and taking the opportunities will need a substantial increase in investment over the next two decades.

This is an imperative and an opportunity.

This investment will deliver a new growth story; much more attractive than the dirty, destructive models of the past.

The question now is how to foster the investment that we now need.

The majority of the action will be in EMDCs as they grow faster than developed, build their infrastructure, and urbanise.

Investment required in physical, human, and natural capital. And for growth, mitigation, and resilience.

The argument of the book: beyond the Stern Review to the creation of the new growth story

The Stern Review argued that the cost of inaction far exceeds the cost of action. That conclusion is still stronger now.

But we are now beyond that comparison. Inaction or weak action would be catastrophic: not a realistic option.

Strong action generates a dynamic new growth story: driven by investment and structural change. Not a narrow cost story.

There is no horse race between climate action and economic growth and development.

That growth is very different from past models sustained over the next two decades: we must break the link between economic activity and destruction of the environment.

Delivery requires greatly increased investment and fundamental structural change, sustained over the next two decades.

The challenge is how to foster and finance that investment; how to create the new growth story. Rising to that challenge is the focus of this book.

0 The essence of the argument

1 The fundamentals: science and ethics

2 Acting now: necessary, feasible, attractive

3 The growth story

4 Making it happen: investment, policy, finance

5 Making it happen: leadership, role of the state, and collaboration

6 It can be done

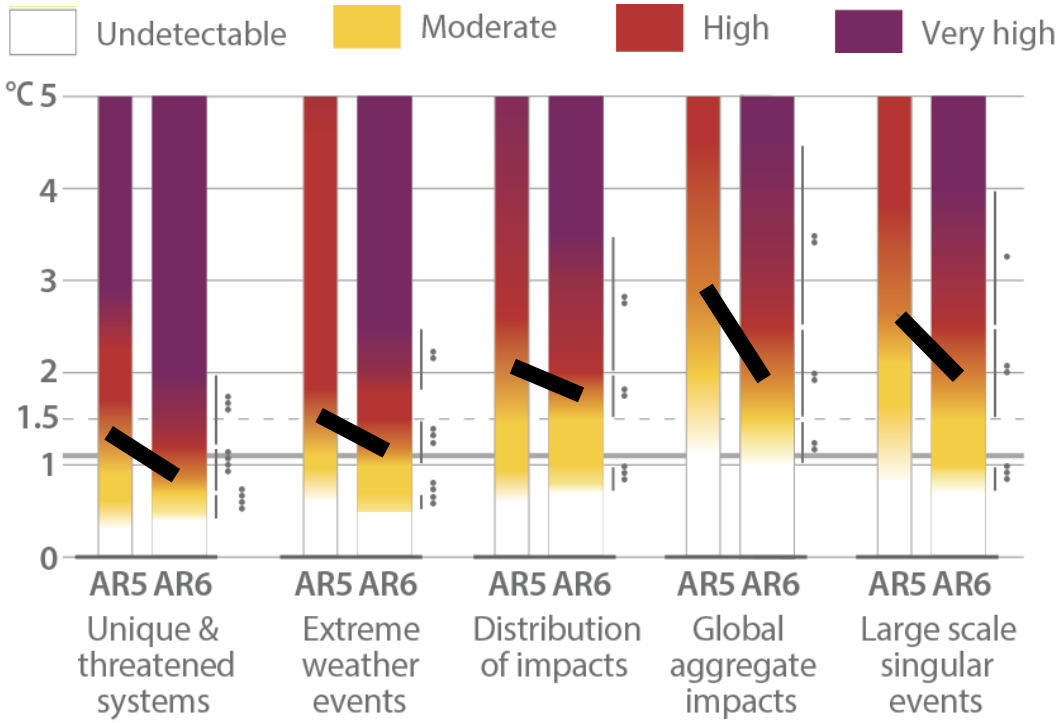
7 Key messages

The more we learn, the worse it looks

As emissions go on rising and the science advances, the evidence gets ever clearer and more worrying. The need for strong and urgent action is ever more intense.

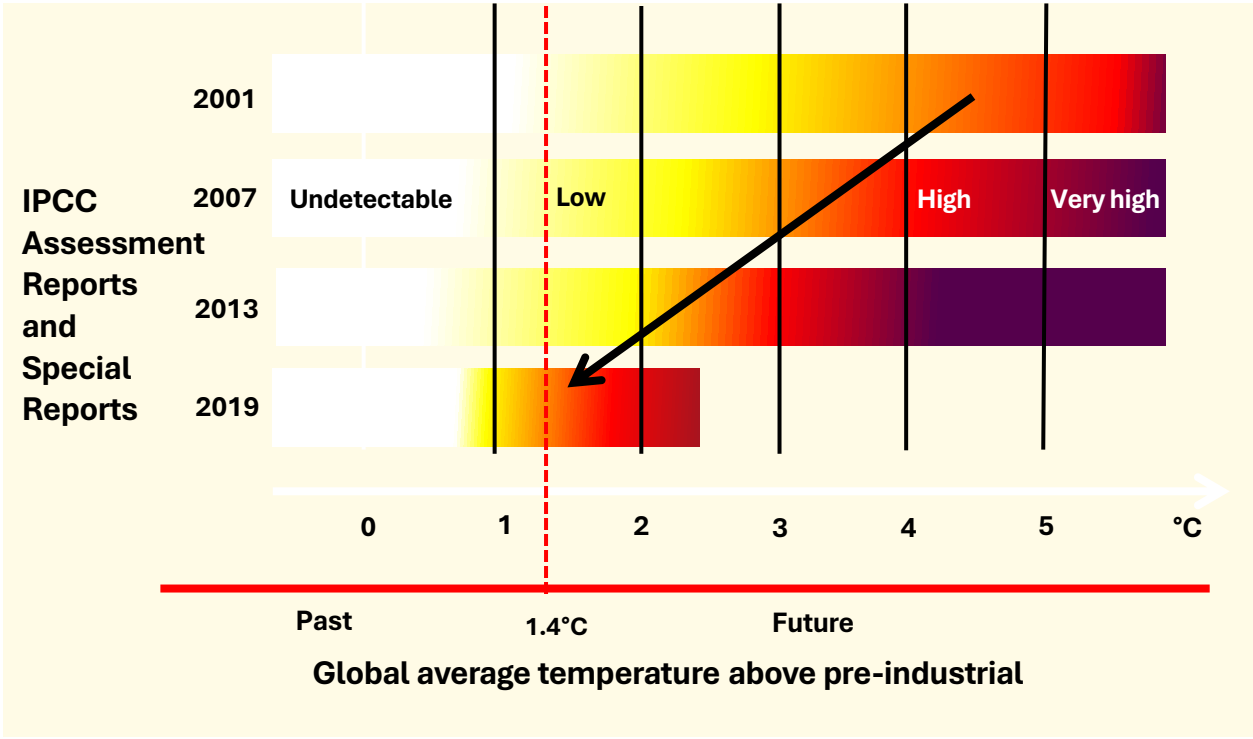
Risk/Impact

Global reasons for concern in AR5 (2014) VS AR6 (2022)



Source: IPCC (2023), via Rogelj (2025)

Changing risk assessment of tipping points

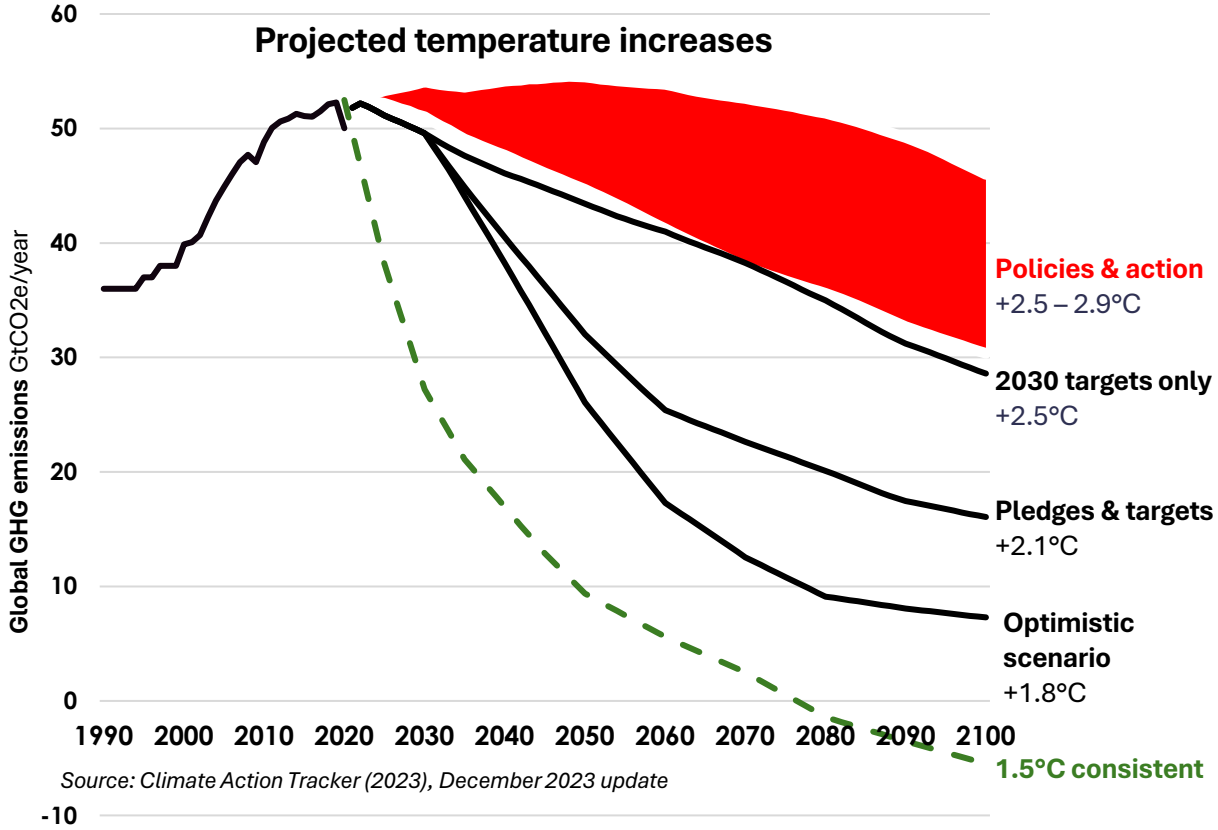


Source: Lenton (2025)

At the time of the Stern Review (2006), the latest IPCC report was AR3 (2001). The risks of tipping points are now much higher than we envisaged then. They now appear possible and likely around 1.5 °C to 2 °C. Tipping points concern failures of or collapse in: ice sheets, coral reefs, permafrost, Amazon forest, AMOC… Potentially devastating and unstable outcomes.

Where we are heading and the urgency of action

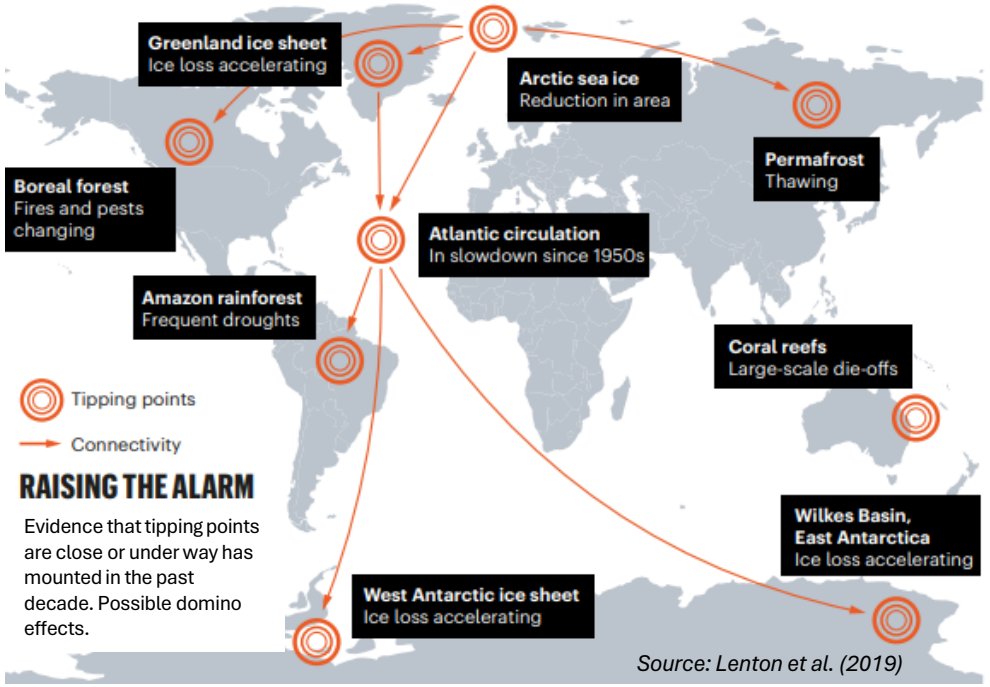
Under current policies, temperatures are headed to potentially catastrophic warming of close to 3°C by 2100. And 2°C by the 2060s.



Source: Climate Action Tracker (2023), December 2023 update

Future risks escalate rapidly with every fraction of degree of warming, particularly as 'tipping points' could be passed.

Tipping points would create powerful dynamic feedbacks, rapid temperature increases, instability, and environmental catastrophes.



Our planet has not experienced average temperatures that are 3 °C higher than pre-industrial level for around 3 million years. Sea levels were then 5–25 metres higher than today (Miller et al., 2012; IPCC, 2023). Humanity has developed and lived in the Holocene period (roughly last 12,000 years) in a fairly stable climate and temperature, mostly in the range +/- 1 °C, relative to the end of the 19th century.

Climate risks could lead to large-scale movements of people, potentially hundreds of millions or billions and, as a consequence, severe and extended conflict (Brown, 2008; Clement et al., 2021; Institute for Economics and Peace, 2020).

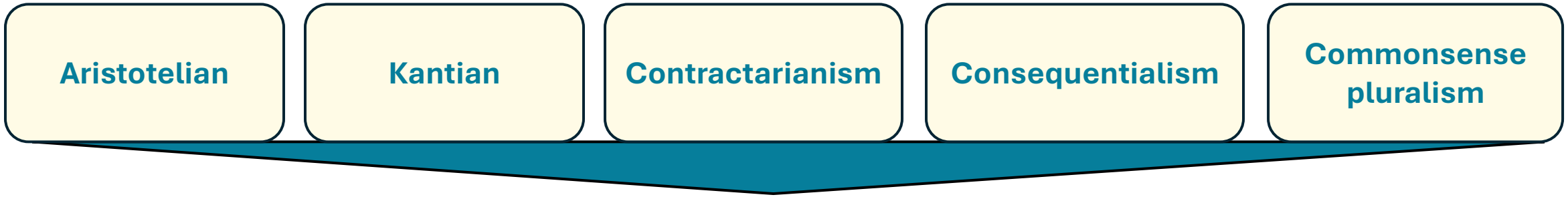
Climate change drives biodiversity loss and biodiversity loss drives climate change.

Potential immense consequences of our decisions in coming years, for so many, force explicit discussion of ethics

The responses to the climate and biodiversity crises will have profound consequences for this and future generations.

Ethics and values are basic to our choices.

Economists have all too often refused to take explicit and engaged account of ethical issues and difficulties.



STRONG ACTION
Imperative to act

Economics and other social sciences cannot duck discussion of ethics and values. Values cannot be *read off* from markets, such as in attempts to use interest rates or rates of return in markets as indicators of social discount rates. Markets embody private decisions, and many such markets are full of imperfections. Values are inevitably normative, and a number of positions can command attention. Values should be discussed explicitly and with rigour. Economics has largely focused on consequentialism.

Sustainability, rights and justice I

Sustainability: offering future generations opportunities at least as good as the opportunities available to the current generation, assuming that future generations behave similarly towards those that follow. Those opportunities are shaped by assets and endowments: physical, human, natural and social capital.

Evolution in our collective understanding of what constitutes development.

At the heart of this agenda is the strong argument that **all people and countries have the right to develop**.

It is core to notions of common humanity. It is embodied in many moral codes and perspectives, including perspectives on human rights in Europe and USA of 18th century. But also in moral and religious codes across countries and centuries.

It is the **right to development** that underpins the SDGs:

'We are determined to end poverty and hunger in all their forms and dimensions, and to ensure that all human beings can fulfil their potential in dignity, equality, and a healthy environment'

(UNGA, 2015, p. 2)

Sustainability, rights and justice II

'It is not justice to foul the planet because others have fouled it in the past.'
Prime Minister Meles Zenawi at COP17 in Durban in 2011.

Most would agree that there is a right to development but that does not imply the right to emit.

Emissions kill and the assertion of a right to kill is not morally convincing. **Emissions harm opportunities and thus the right to development.**

Development requires energy, but energy does not need carbon.

Advanced economies have historically contributed a much larger share of cumulative emissions. They have damaged the right to development of others, particularly poor people who are hit earliest and hardest by climate change. **They should cut emissions quickly.**

A focus on the right to development then points to the obligation of advanced economies to support EMDCs in pursuing their right to development. And the EMDCs should not follow the dirty models of the past and cause damage to future generations.

Discounting: understanding inter-temporal valuations

Decisions now affect lives and livelihoods, and the risks faced, in the future. Intertemporal valuations are central.

Economics has been far too casual and simplistic about discounting and valuations applied to future impacts and consequences.

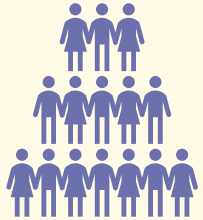
Social discount factor
The relative social valuation of an extra unit in the future, relative to an extra unit now

Social discount rate
The proportional rate of fall of the social discount factor

The valuation of an extra unit at time *t* will depend, for most ethical observers, on:

i. The levels of those living at time *t* relative to now

High valuation if future generations are likely to be poor; low if they are likely to be rich



ii. The valuation of a future life (or utility) relative to one now

'Pure-time discounting', embodies valuations which discriminate by date of birth across individuals even if their positions are otherwise identical

Hard to provide a serious ethical argument in favour of pure-time discounting. Exogenous chance of extinction could justify only very small pure-time discount rates.

Many earlier discussions have been muddled because they did not start with the fundamentals of discounting: the definition of discounting and the values. The case for urgent action is now mostly driven by the magnitude of future risks; of a magnitude likely to dominate discounting (see Stern, AER, 2008).

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From *The Stern Review* to *The Growth Story of the 21st Century*

The central conclusions of the Stern Review (2006) stand.
In retrospect, they seem to have contributed to the understanding of the criticality of climate action.

(1) 'the benefits of strong and early action far outweigh the economic costs of not acting' (p. xv).

(2) the 'world does not need to choose between averting climate change and promoting growth and development' and 'tackling climate change is the pro-growth strategy for the longer term' (p. xvii).

(3) 'climate change is the greatest market failure the world has ever seen' (p. xviii) and a 'range of options exists to cut emissions; strong, deliberate policy action is required to motivate their take-up' (p. xvii).

We are now going beyond comparing the cost of inaction with that of action.
We are setting the question differently. Inaction would be catastrophic. Action is a dynamic new growth story.
The question now is the "what" and the "how".

From cost to investment opportunity

It was assumed that low-carbon sources of energy were more costly than fossil fuels.
That has changed. We did not anticipate in 2006 that the cost of solar electricity would drop by 80% over the next decade and continue falling very rapidly.

The risk of inaction increased

The more we learn, the worse it looks.

The IPCC warnings on the strength of the effects of climate change and the confidence in the conclusions have grown ever stronger.

Achieving net zero is essential

The Paris Agreement aims for net zero. The Stern Review took the then articulated criteria of cutting emissions by 80% between 1990 and 2050. Net zero is a criterion which should be embraced by all players since the amount of net negative emissions is likely to be small.

The role and importance of natural capital

Stronger emphasis on natural capital as a whole, particularly biodiversity.

Sustainability is about offering to future generations opportunities at least as good as ours and that is clearly broader than climate.

It is clear that we have to act. We have to act now. We understand enough to move forward with purpose.

There is both an investment opportunity and an investment imperative. This book is about the dynamics of change and how to make it happen.

Acting now: critical two decades, with the Global South at centre stage

Choices made on infrastructure and capital through the next two decades will either lock us into high emissions or set us on a low-carbon growth path which can be sustainable, resilient, and inclusive.

Likely global growth and change in the next decades: three doublings

2060	Global building stock		**2x**	**Strong growth in EMDCs through income levels with strong demand for infrastructure**.
2050/ 2060	GDP		**2x**	Growth of approximately 3% per annum. **Led by emerging and developing countries.**
2050	Urban Population		**>2x**	**Urban population will more than double by 2050,** at which point 7/10 people will live in cities.

At the same time

- CO2 emissions
- Adaptation and resilience

The challenge is to both change the nature of investment and to increase it. If we fail to do this quickly, then growth and development will likely be halted, reversed or undermined as a result of the hostile environment created.

Since 2000, EMDCs have contributed an average of 60% of annual global growth – double their share in 1990s – and this figure is set to rise to 65% by 2035 (World Bank, 2025; Perez-Goropze et al., 2024).

Even in a middle-income country like **India the majority of the urban infrastructure likely to exist in 2047 will be built between now and then** (Kouamé, 2024).

Because much of EMDCs' infrastructure has yet to be built, **many can leapfrog straight to cleaner, more efficient technologies and structures.**

It is in the developing world where the majority of world growth will occur, and where most of the infrastructure and other investments will be made in the coming two decades. Huge leapfrogging opportunity.

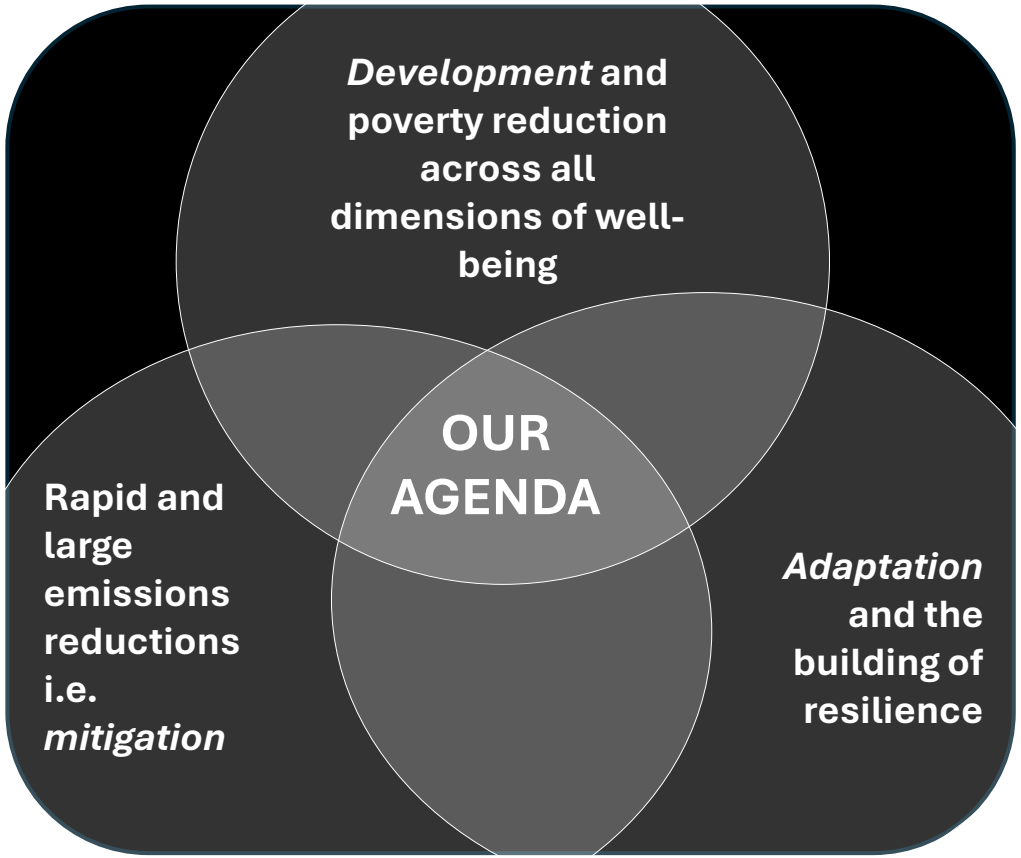
Actively integrating development, mitigation, and adaptation and resilience: no "horse-race" between climate action and development

The agenda for action is determined both by the urgency and by the scale of action necessary to tackle the immense risks and to embrace the opportunities for a new form of growth.

This is not about "balancing" or making development and climate action "consistent". **Action on climate change can be a powerful driver of development.**

There is no "horse race" between climate action and development. On the contrary, climate action drives development.

The core of the action agenda is the overarching task of combining all three of the following:



This is a growth story which advances living standards across the full range of dimensions and breaks the destructive relationship between economic activity and the environment.

The question becomes how you make the new growth happen.

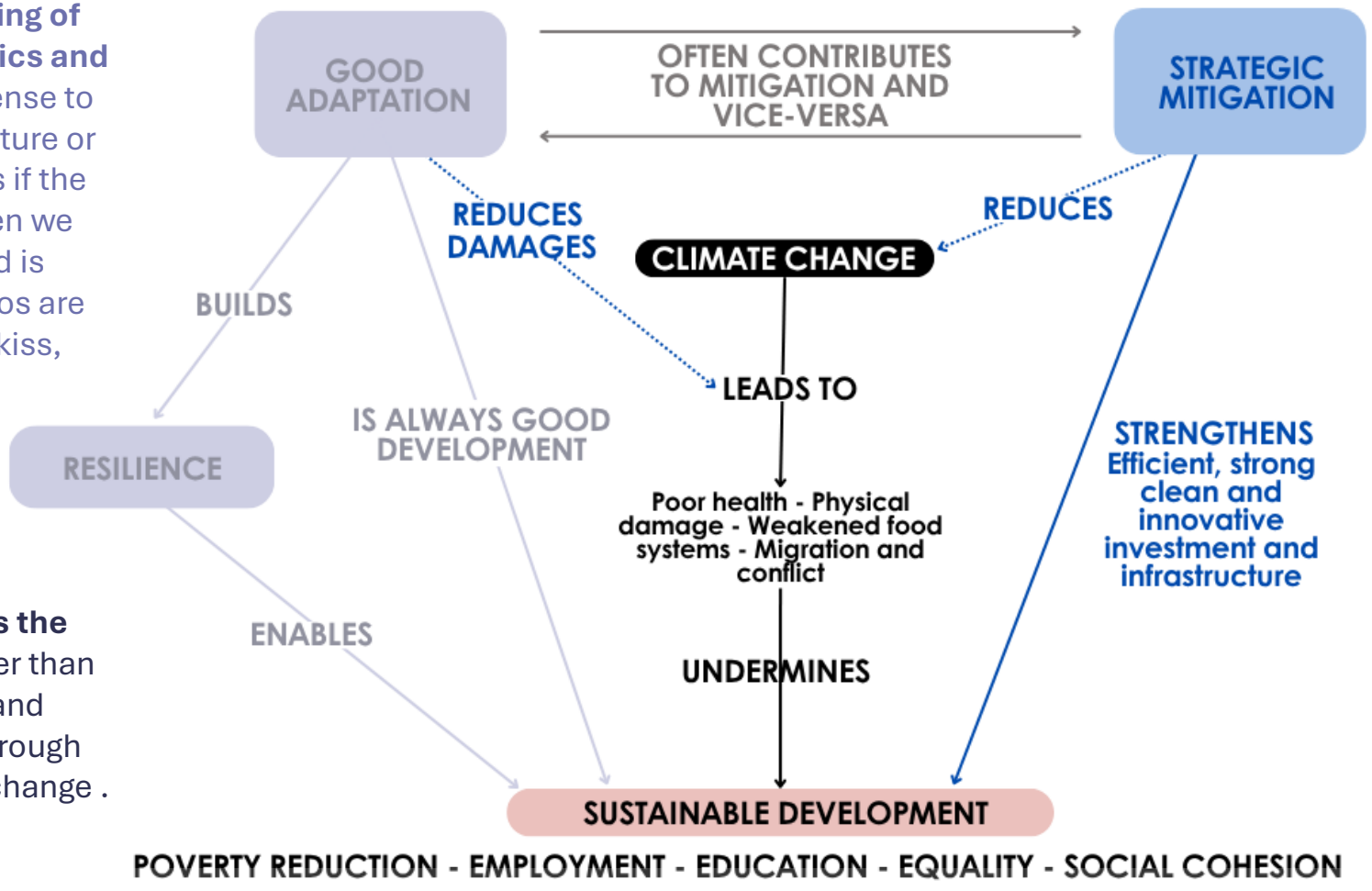
Key tasks in achieving the agenda

- Expand investment in all four capitals.
- Systemic, structural, and technological change.
- Right kind and sources of finance for investments.
- Manage inevitable dislocations: create a just transition.
- International collaboration around delivery on the Paris Agreement.

Actively integrating development, mitigation, and adaptation and resilience II: understanding their core relationships

The central thesis of this book is that strong, well-designed climate action can drive a new attractive form of growth that is sustainable, resilient, and inclusive.

Adaptation and the building of resilience is basic economics and good sense; it makes no sense to build houses and infrastructure or follow cropping patterns as if the climate is unchanged when we know it has changed and is changing. Benefit-cost ratios are high: up to 10 times (Watkiss, 2022).



A stable climate brings the freedom to prosper rather than halting development and hampering well-being through hostile effects of climate change .

The investment, innovation, and structural change that can deliver the radical change in economic activities necessary to reduce emissions and protect biodiversity, **can also deliver a much more attractive story of growth and development** than the dirty, destructive growth models of the past.

Mitigation avoids the unmanageable; adaptation manages the unavoidable

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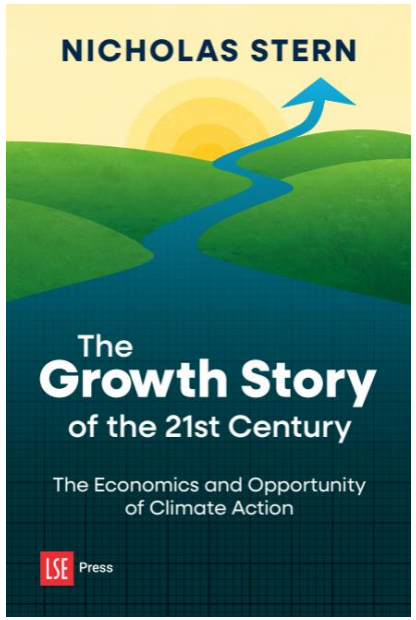
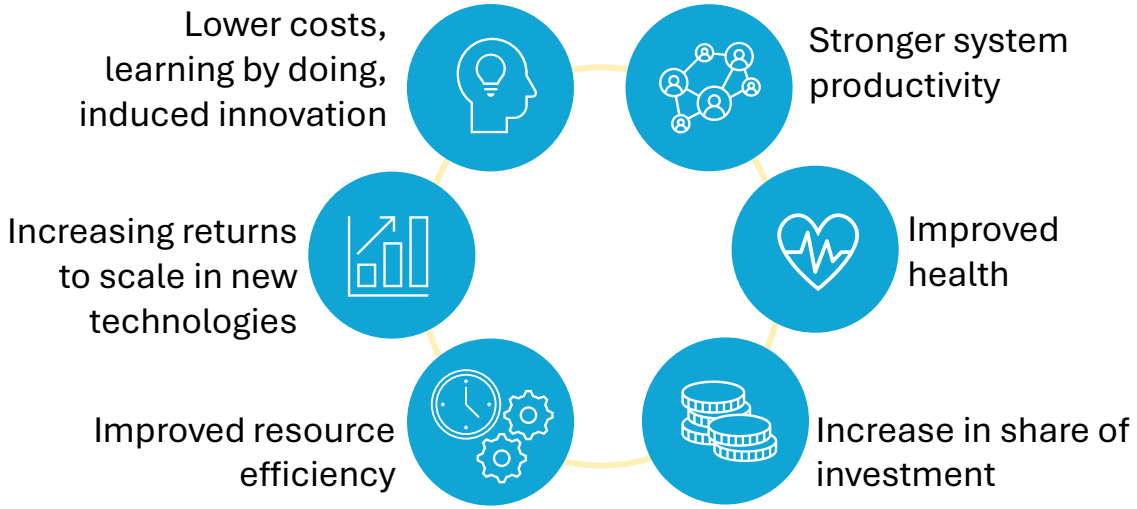
The growth story of the 21st century

Promoting sustainability requires strong investment in all four capitals. There is no inevitable 'trade-off' between climate action and growth. On the contrary, this investment drives growth.

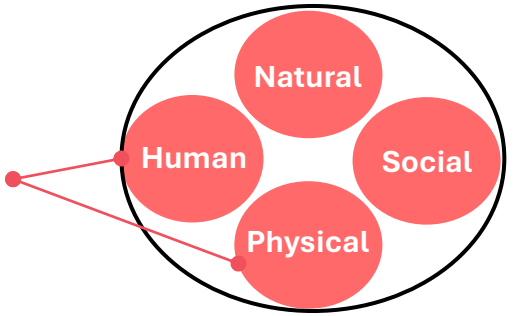


Six drivers of growth



Investment in natural capital will enhance, and prevent the undermining of, growth

Physical and human capital drive growth



Investment in social capital offers stronger commitments, collaboration and trust, and reduces hostility to change

Short term

Investment in sustainable infrastructure and other assets can boost shorter-run demand and growth, sharpen supply and efficiency, reduce waste and pollution, promote sustainable development and reduce poverty. Building resilience has high returns, fostering and protecting growth.

Medium term

Spur innovation, creativity and growth in the medium term, unleash new waves of innovation and discovery.

Long term

Low-carbon is the only feasible longer-run growth on offer; attempts at high-carbon growth self-destruct.

This is a dynamic story about investments, innovations, and structural and systemic change. Mitigation, adaptation, and development are interwoven and mutually enforcing.

The driving forces of the new growth story:

1. Lower costs, learning by doing, induced innovation

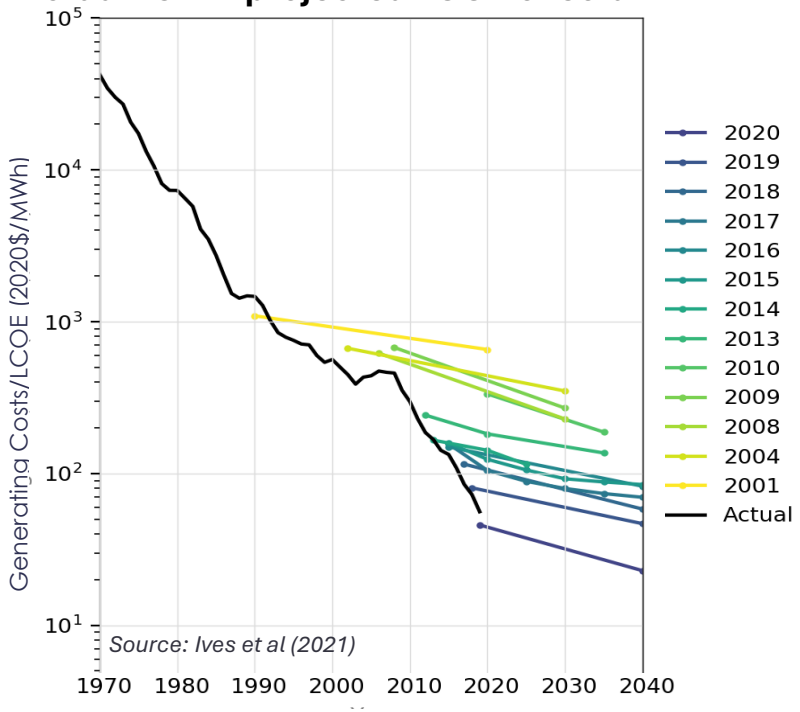
The pace of technological advancement and cost reduction in key new technologies has been extraordinarily rapid, often far exceeding expectations.

Key cost reduction drivers

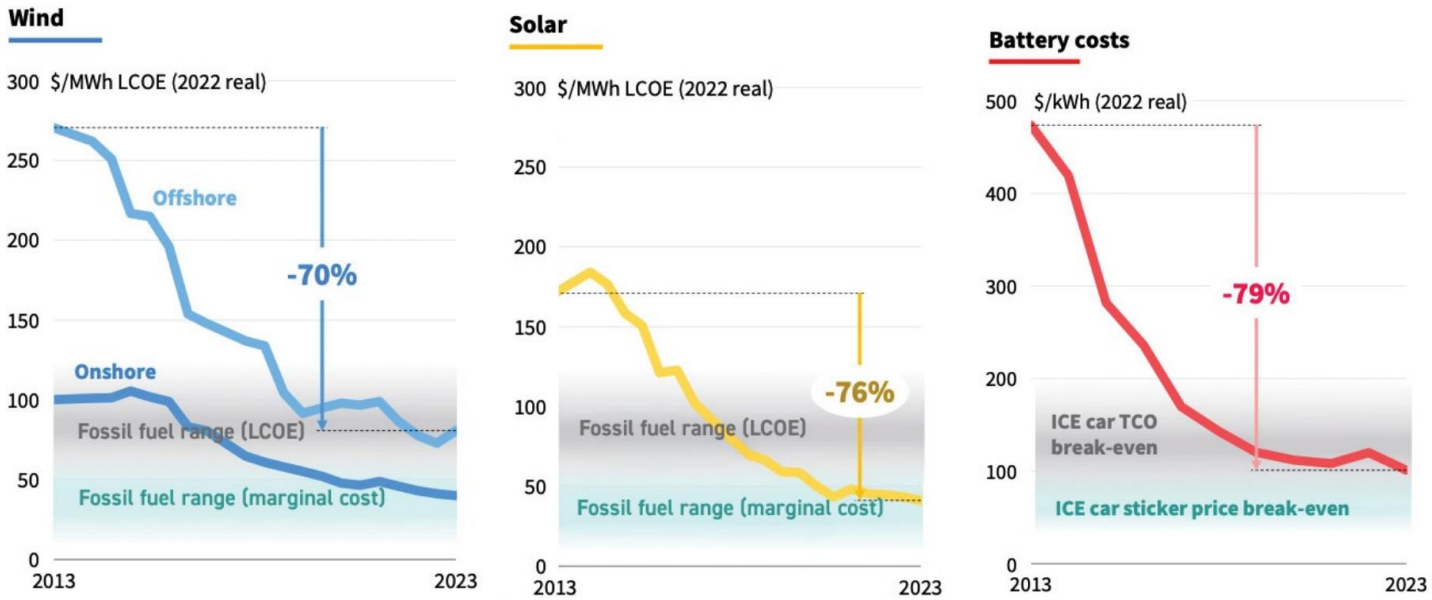
(a) Learning-by-doing (b) Economies of scale (c) R&D and innovation

All this with, on average, so far modest policy. Can accelerate.

Actual vs IEA projected LCOE of solar PV



Renewable power technologies: decreases in the levelised cost of electricity



Source: Adapted from Bond et al. (2024, p. 8).

Globally, solar electricity is now, on average, 40 USD/MWh, and the cheapest form of power in many countries. India and China have costs of around 30 USD/MWh (IRENA, 2025).

The driving forces of the new growth story:

2. Increasing returns to scale in new technologies

Many sources of economies of scale can be mutually reinforcing, e.g.:

Network/scale effects. Clustering effects of scale. AI management of systems.

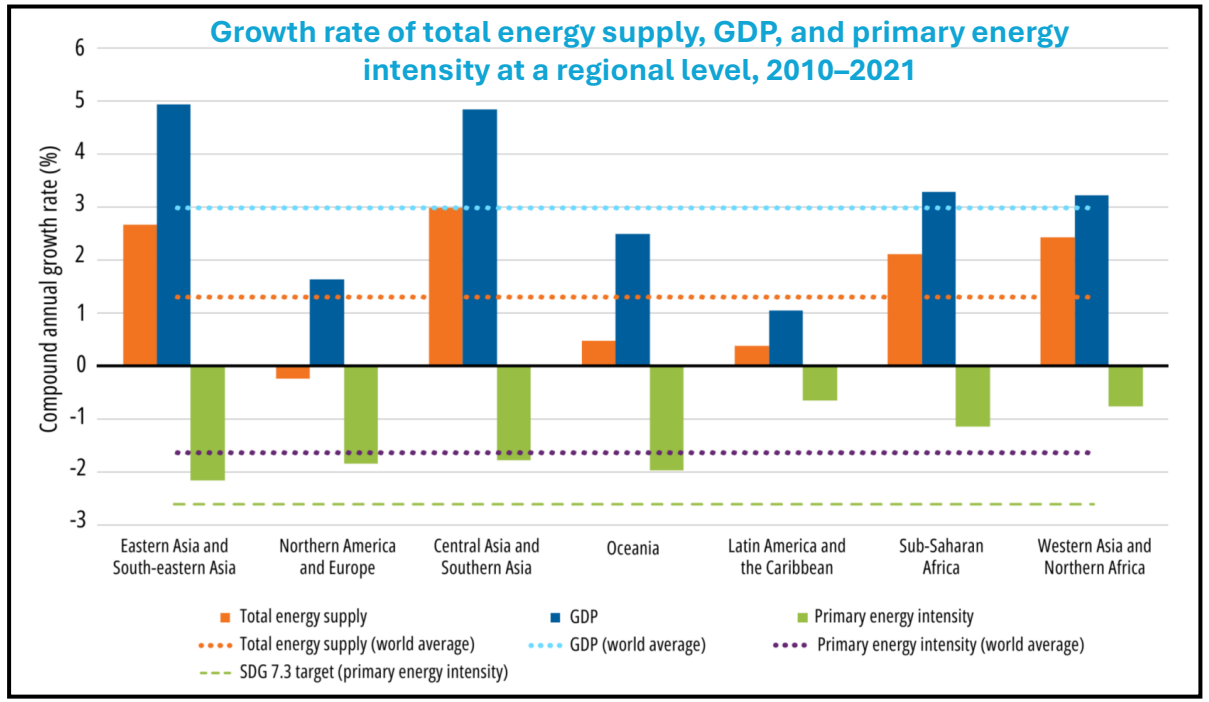
New materials. Discovery costs imply scale effects.

*Economies of scale can be seen in **India's adoption of LED lightbulbs.** Through large-scale public procurement, **the cost of LED bulbs was reduced by 85% within four years**. India now aims to replicate this success with electric buses (Anadon et al., 2022).*

3. Improved resource efficiency

So much is wasted through poor design, inadequate insulation, faulty operation, and so on. Investments in resource efficiency have great potential, including the circular economy. Energy efficiency is of special importance. **Efficiency means productivity means growth.**

Countries and the private sector are moving on resource efficiency, particularly in energy. Energy intensity has decreased across all regions since 2010 (IEA et al., 2023).



4. Improved health

Reducing fossil-fuel combustion will drastically reduce impacts of air (and other) pollution on health, increase productivity, and reduce the associated burden on the economy. 10-15% of world's deaths per year are associated with air pollution. In UK, deaths from air pollution are 20 times those from road accidents. **Enhancing human capital enhances productivity and growth.**

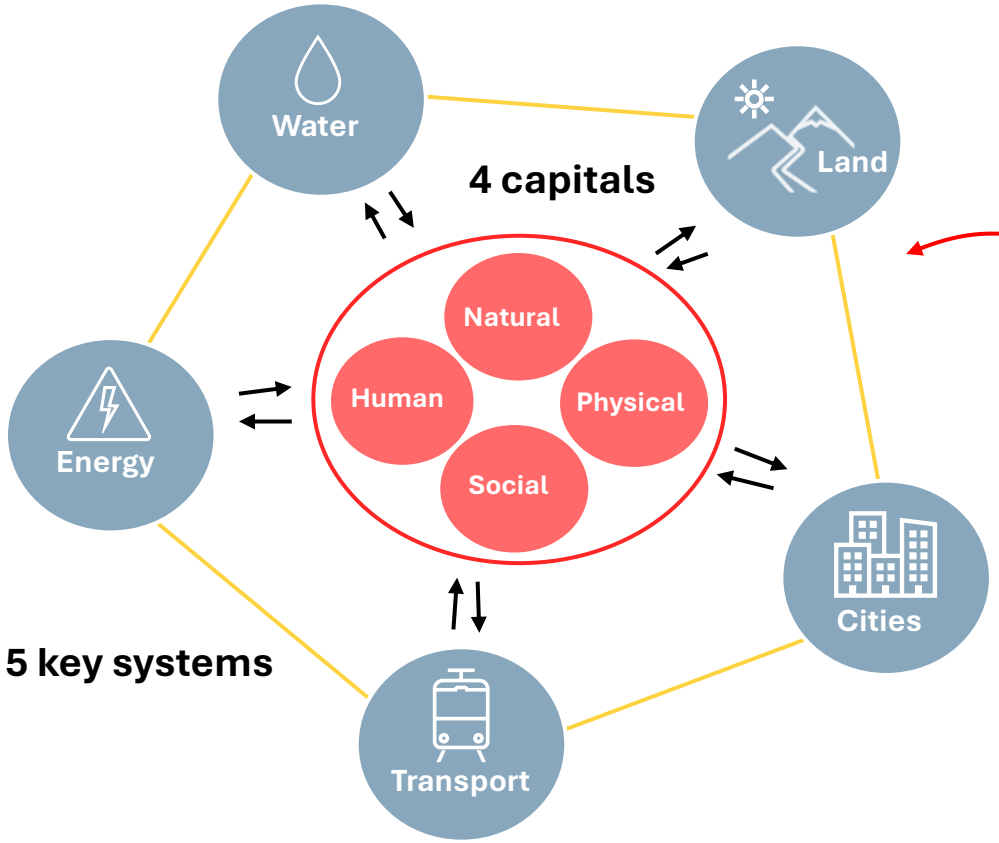
5. A major increase in investment.

An imperative and an opportunity.

6. Stronger system productivity

Systems can be much more productive.

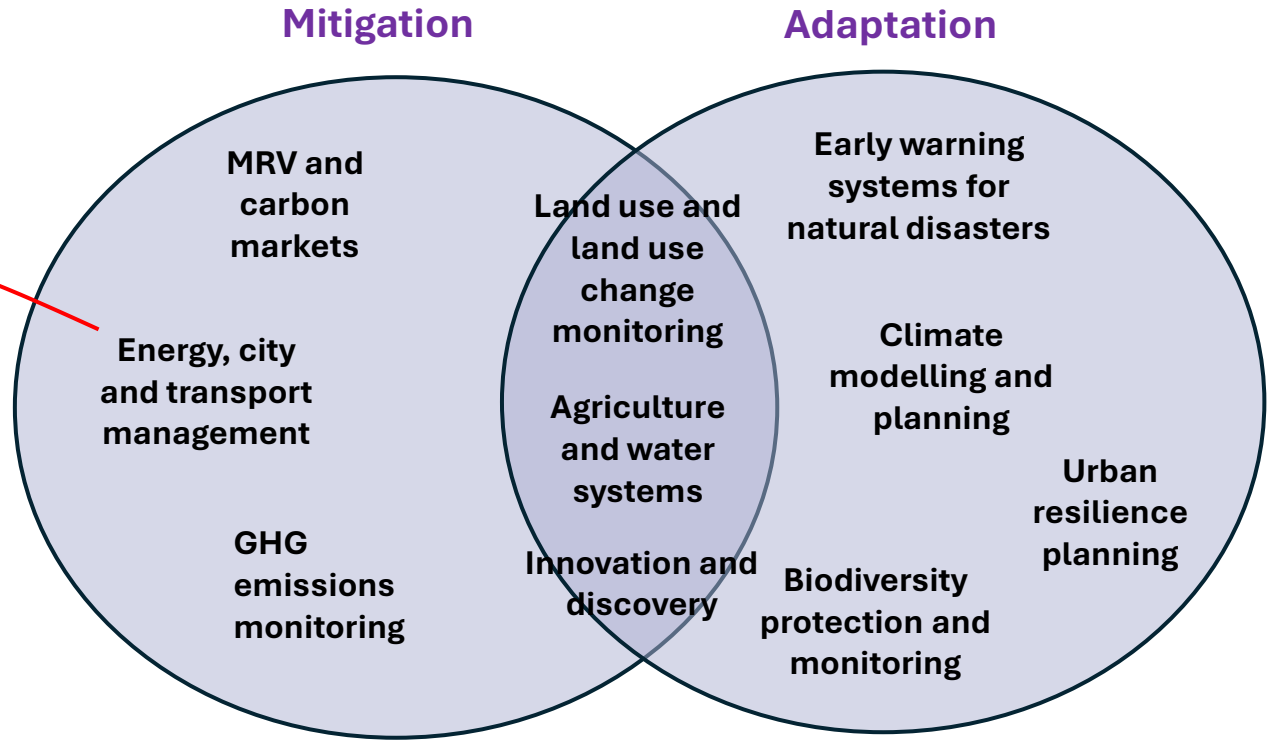
For example, inter-connected transport systems, with smooth links between public and private and greater scope for cyclists and pedestrians, create cities that are much more efficient and productive than those associated with traffic congestion and those that weaken and kill via air pollution.



The development of AI is likely to accelerate powerfully into the 2030s, and it will surely play a crucial part in this new growth story

There is huge potential for AI in helping reshape the crucial systems in cities, energy, transport, land, and water, which will be at the heart of the transition to the new economy (Stern et al., 2025; Stern and Romani, 2023; Zenghelis et al., 2024).

Applications that utilise these technologies can contribute to advancing both adaptation and mitigation action.



Also, AI can be critical for economic development by driving innovation itself.

The scope for clean innovation is immense

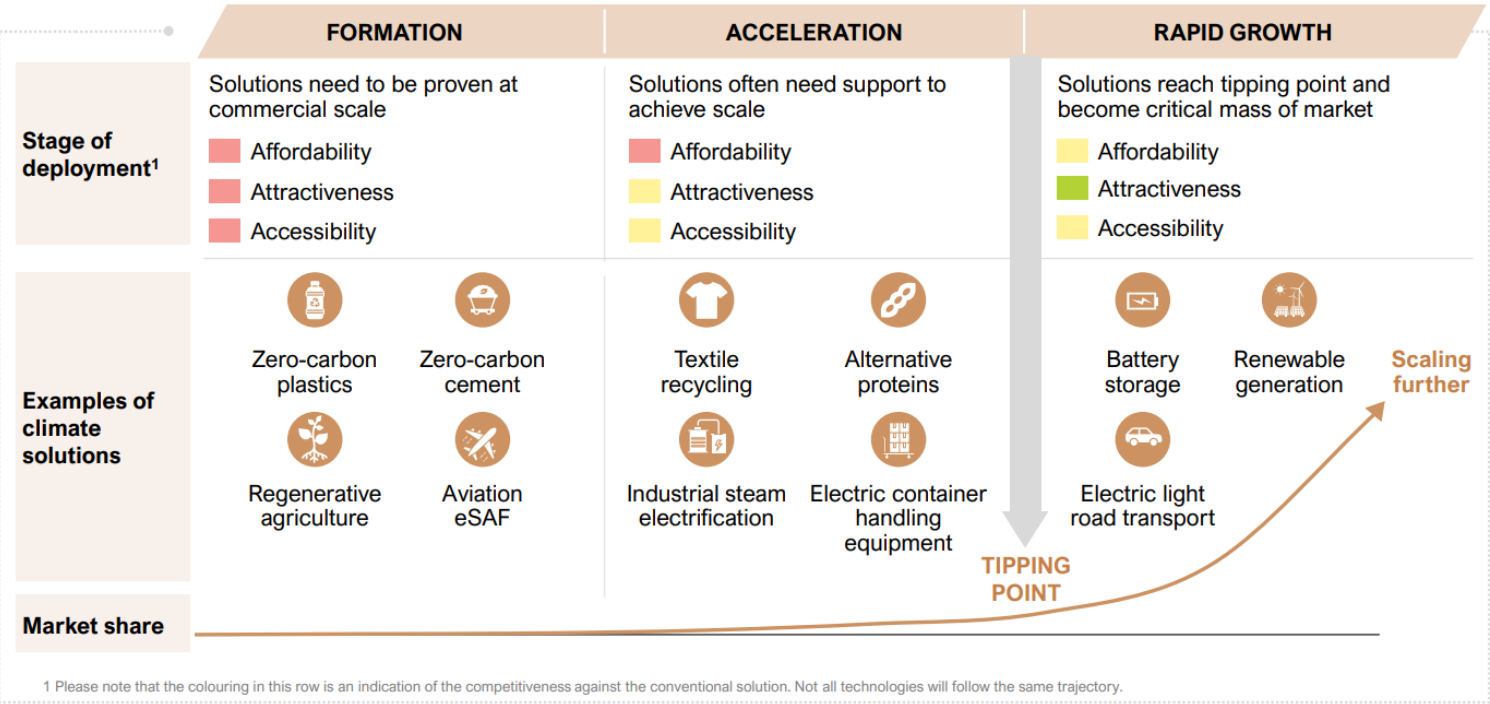
The clean is now cheaper than the dirty in sectors accounting for one-third of emissions, and that proportion is likely to grow rapidly in the next decade (Systemiq, 2020).

Positive technological tipping points refer to critical cost and technology thresholds after which the technology outcompetes incumbents on

- **Affordability**
- **Attractiveness**
- **Accessibility**

Adoption and diffusion accelerate as a result:

Illustrative overview of different stages of technology deployment



Source: Systemiq (2025, forthcoming)

The links among sectors can sometimes imply that when one tipping point is crossed in one sector, it can lead to tipping point cascades, where progress in other sectors is accelerated.

For example, falling costs in clean electricity, an output of the energy sector, can lead to lower costs – and thereby a tipping point – in other sectors, such as electric vehicles (EVs) or green hydrogen.

Well-designed policies can help initiate and drive such cascading effects. For example, mandating zero-emission vehicles can lead to ↑EV deployment, ↑demand for renewables, and ↑innovation, which in turn ↓the cost of batteries and ↓the cost of renewable energy storage (Systemiq, 2023a).

Economic analysis is more straightforward with simple competitive equilibrium, diminishing or constant returns to scale, and modest changes in technology.

Time for economics to be more dynamic and tackle more strongly issues of structural, systemic and technological change.

A new energy landscape and a new economic geography

Fossil fuel era

Dirty

Rising marginal costs

Geographically concentrated

Many countries depend on imported fossil fuels that come through vulnerable chokepoints

Changing comparative advantages and new technological demands for various resources are altering the location of economic activities, generating new industries, and shifting trade and investment flows.

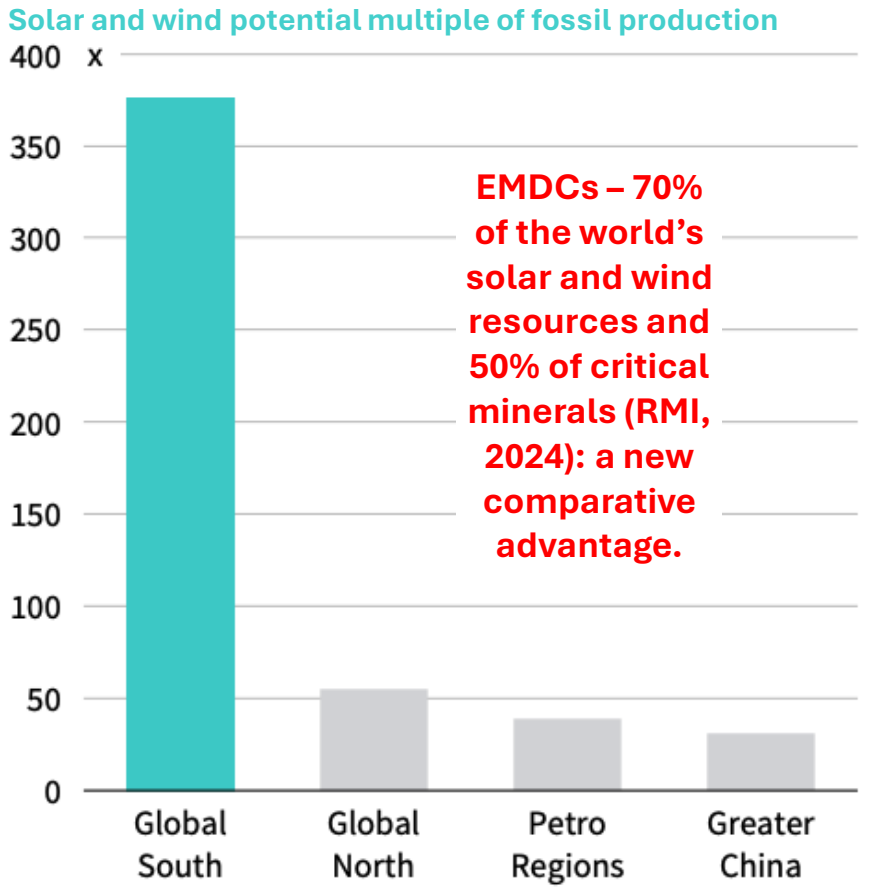
Technology that delivers local energy, that is cleaner and cheaper than fossil fuels.

Development and adoption of new technologies (e.g., EVs, heat pumps, …)

Widespread availability: 92% of countries have 10x as much renewable energy potential as energy demand (Ember, 2025).

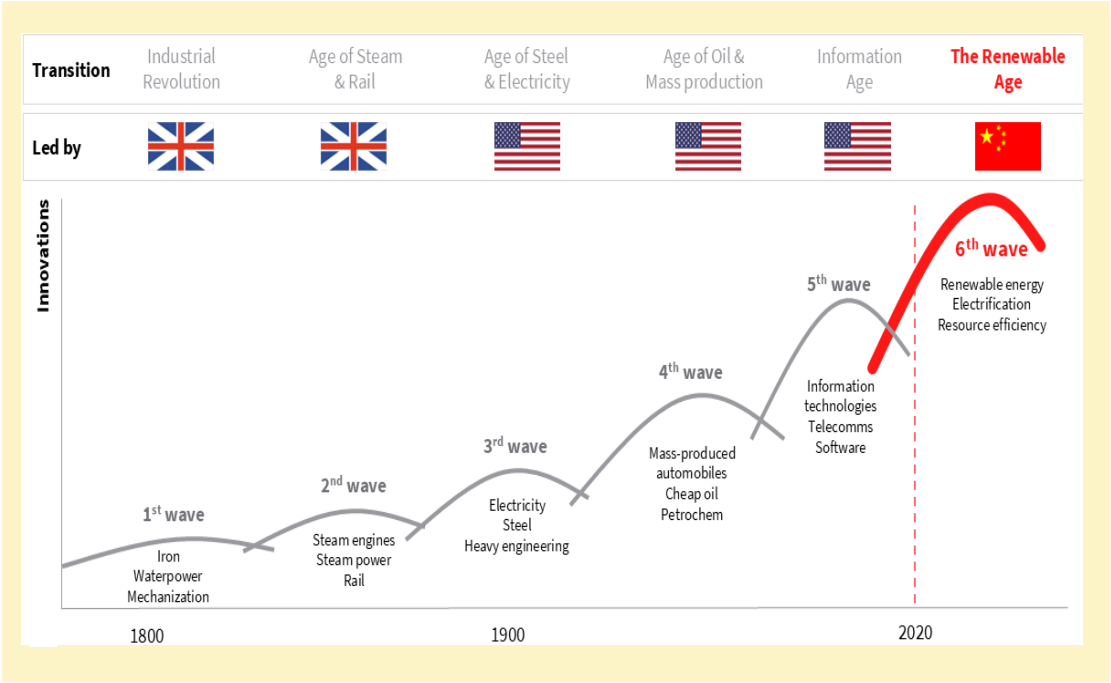
Enhanced energy security.
World markets for fossil fuels are volatile. Solar and wind are available and free as inputs. Need upfront capital to generate; investment in grids and storage make them reliable.

Growth in demand for minerals.
Diversification and competition in mineral extraction and processing are important objectives.



Source: RMI (2024)

The 6th Industrial Revolution: led by China



Source: RMI (2024).

In 2022, solar PV capacity added in China was 45% of the global total

In 2023, clean energy accounted for 40% of its GDP growth

China exceeds expectations set in **14th FYP (2021-2025):**

Ahead of plan (with 2030 aims)

Surpassed 2030 aim of 1,200 GW of wind & solar capacity

Seems to be close to achieving 2030 peak emissions aim

2022 — 2023 — 2024 — 2025

In 2023, more than half of the EVs on the roads of the world were situated in China

15th FYP (2026-2030) will be critical for the world's future

Sources: IRENA (2023), IEA (2024), Carbon Brief (2024), You (2024)

China is exceeding expectations in its energy transition and is in the vanguard in the manufacturing and rise of clean technologies, and in the refining of critical minerals. But current and planned emissions still high in relation to Paris goals.

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Making it happen: advancement of investment in clean energy

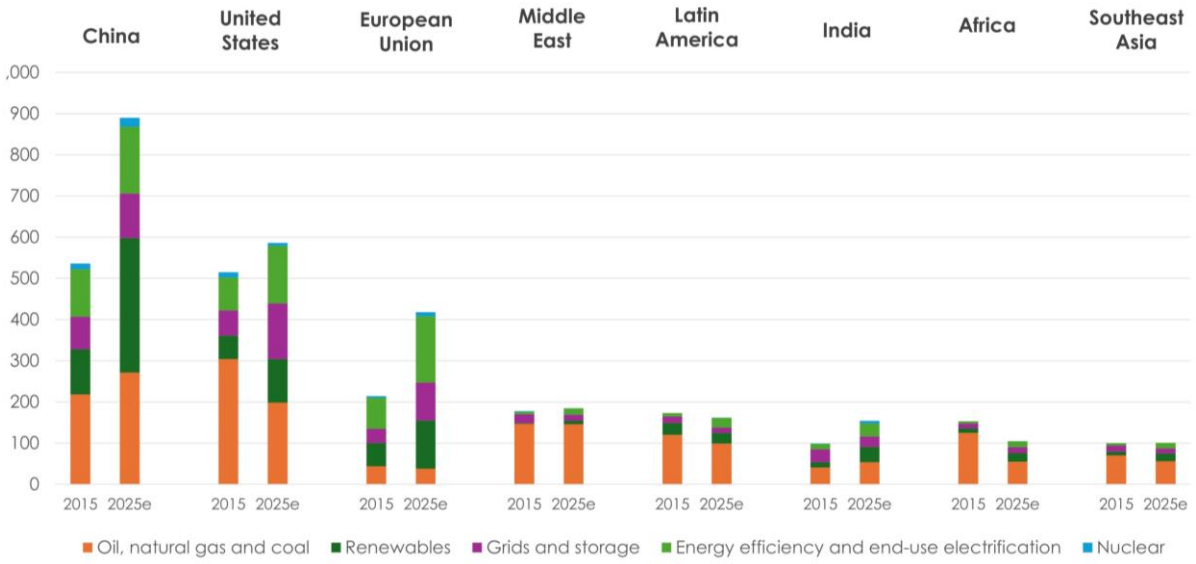
- In 2024, the majority of the increase in global electricity demand was met by the growing supply of low-emission sources, with **80% of the increase in global electricity generation being produced by renewable and nuclear sources** (IEA, 2025a).

According to the International Energy Agency (IEA), for 'every USD 1 spent on fossil fuels, USD 1.7 is now spent on clean energy. Five years ago [in 2018], this ratio was 1:1' (2023b, p. 12). In 2025, this ratio is expected to reach 2:1 (IEA, 2025b).

- **High-income countries and China continue to play a dominant role.**
- **However, emerging markets attracted more than double the total new renewables investment in 2023 compared to 2018**, and 85% of low- and middle-income economies deployed more renewable energy capacity relative to fossil fuels in 2023 (Cuming, 2024).
- **The shift has begun in these countries, although it remains small in relation to their economies, populations, and opportunities**, compared to high-income countries and China. In many cases, there are powerful barriers in the investment climate and the cost and availability of capital.

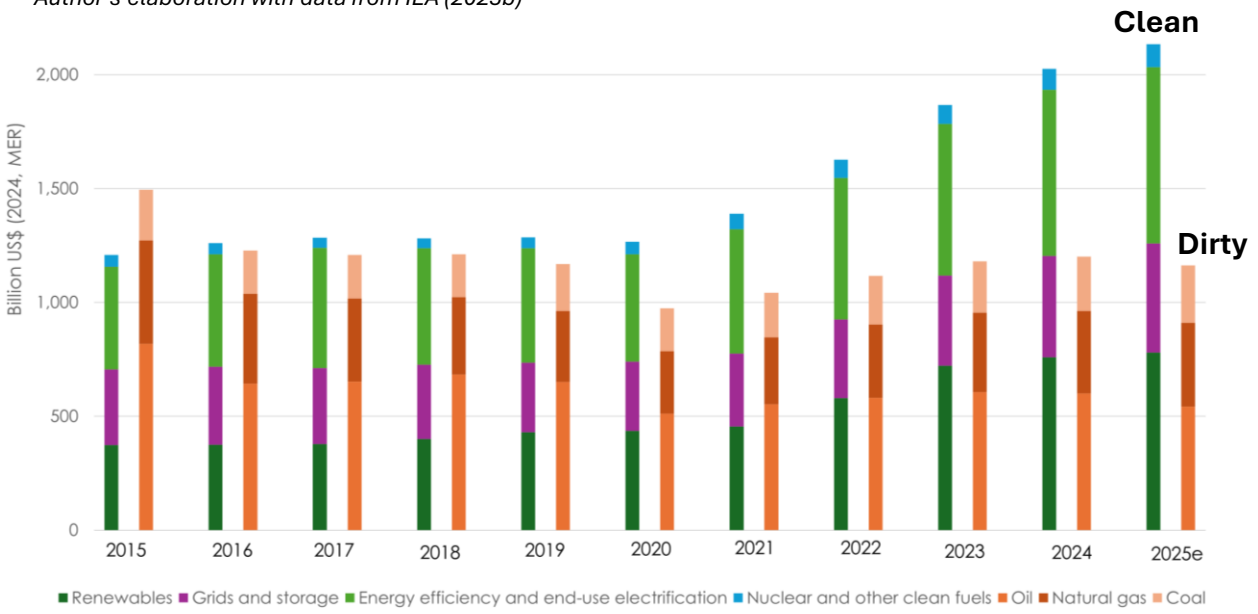
Annual energy investment by selected country and region, 2015 and 2025e

Author's elaboration with data from IEA (2025b)



Global investment in clean energy and fossil fuels, 2015–2025e

Author's elaboration with data from IEA (2025b)



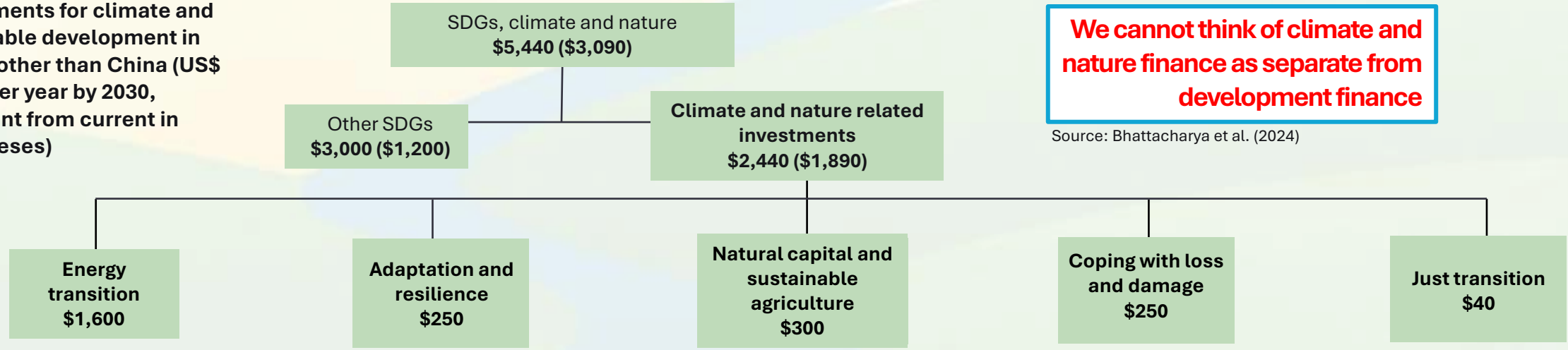
Making it happen: investment

The question now is how to foster the necessary investment, particularly in EMDCs, and how to finance the investment.

Climate action requires substantial investment across all countries and sectors. These investments are not just about meeting climate targets – they are fundamental to economic growth and progress on the SDGs, within which the Paris Agreement objectives are embedded.

Centrality of MDBs and DFIs in reducing, managing, and sharing risk, especially to support private sector commitment and reduce cost-of-capital.

Investment/spending requirements for climate and sustainable development in EMDCs other than China (US$ billion per year by 2030, increment from current in parentheses)



We cannot think of climate and nature finance as separate from development finance

Source: Bhattacharya et al. (2024)

Clean energy plays a vital role in economic development

E.g. Africa holds 60% of the best solar resources in the world (IEA, 2022) but 40% of its population lacks electricity access (IEA, 2023b).

Development actions are key for adaptation

E.g. Enhancing energy and irrigation systems or improving thermal insulation of buildings.

Natural capital avoids losses that obstruct development

E.g. Mangrove forests provide more than US$80 billion annually in avoided losses from coastal flooding (Global Commission on Adaptation, 2019).

Climate hazards impede development through many losses and increased debt

E.g. Since 1970, LDCs have faced climate-related disasters where damages reached up to 30% of a country's GDP (WMO, 2023).

A just transition is about ensuring sustainable development is inclusive

Economies undergo continuous change and transformation. There is a collective responsibility to manage this transition in an equitable and just manner.

Making it happen: policies

GHGs emissions are not the only market failure at play. Carbon pricing is vital but it is a mistake to assert that climate change can be tackled just with a carbon price.

Different market failures point to the use of different instruments, but the collection should be mutually reinforcing

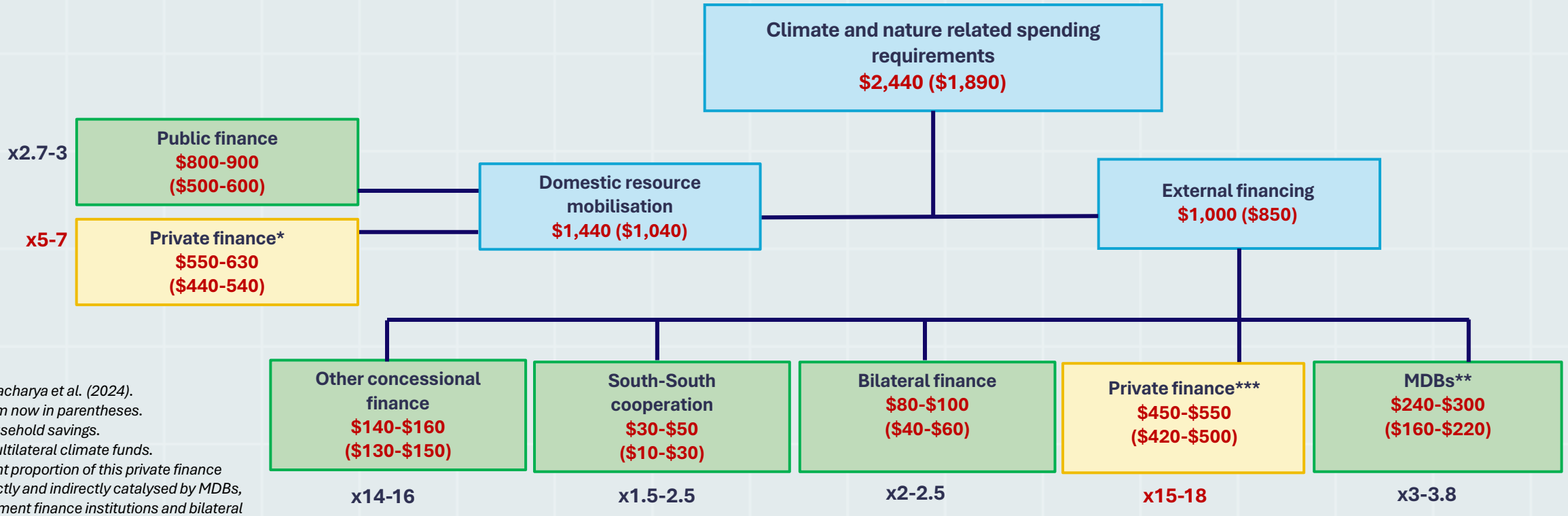
Market failure	Description	Policy option
Greenhouse gases (GHGs)	Negative externality because of the damage that emissions inflict on others.	Carbon tax/ cap-and-trade/ regulation. Do not subsidise the toxic.
Research, development and deployment (R,D&D)	Ideas are public goods, and here their use (climate action) is too. Without public action, the creators of these ideas do not capture their creation's full value to society.	Supporting research, innovation, and dissemination. Tax breaks, support for demonstration/deployment, including via procurement, publicly funded research. Coherent standards to focus research and innovation.
Imperfection in risk/capital markets	Imperfect and asymmetric information and assessment of risks. Problems of collateral.	Risk-sharing/reduction through financial structures, e.g., equity, guarantees. Long-term contracts e.g. for off-take for power; convening power of development banks on investment climate; transparency.
Networks	There are problems of coordination between actors and agents within networks and across networks in key sectors, e.g., energy, transport, cities.	Investment in infrastructure to support integration of new technologies in electricity grids, public transport, broadband, recycling. Management of grids. Planning of cities.
Information	Lack of awareness of technologies, actions or support, or product content.	Promoting awareness of options. Labelling and information requirements on cars, domestic appliances, and products more generally.
Co-benefits	Benefits beyond market rewards are often ignored or downplayed.	Recognising and acting on impacts on health. Valuing ecosystems and biodiversity.

Policy implementation influenced by **political economy and institutional capacity.** Policy should be ***predictably flexible*****. Clear signals steering structural, systemic and technological change.** Industrial policy.

Making it happen: finance

Mobilising the necessary financing for EMDCs other than China (US$ billion per year by 2030)

Four main sources (DRM, private, MDBs, concessional) which are complementary and mutually supportive



Source: Bhattacharya et al. (2024). Increment from now in parentheses.
** Includes household savings.*
*** Includes multilateral climate funds.*
**** A significant proportion of this private finance would be directly and indirectly catalysed by MDBs, other development finance institutions and bilateral finance*

Most of the investment and innovation in this new form of growth will be from the private sector. Hence the importance of fostering enabling conditions for investment.

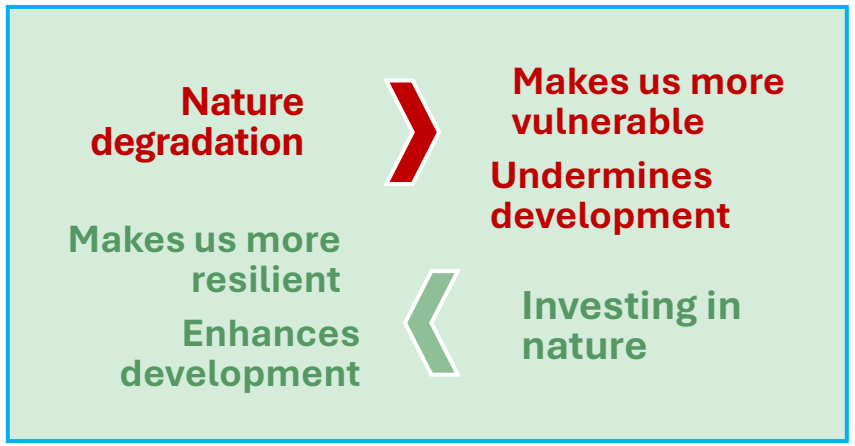
Making it happen: investment and finance in natural capital

Our economies are deeply intertwined with biodiversity, ecosystems, and the broader biome. Investing in these critical structures will mean investments in new geographical areas across the world: part of the new economic geography.

These investments will build and preserve critical infrastructure. **Natural capital is infrastructure** in that it supplies services upon which other activities depend for their effective functioning.

Mangrove forests provide billions in avoided losses from coastal flooding.

They also generate additional economic, social and environmental benefits from fisheries and tourism. And they are very effective at **capturing carbon**.



Restoring degraded forests can generate economic benefits of $7–30 for every dollar invested (WRI, 2017).

Tropical Forests Forever Facility: various financial actors, public and private, are collaborating to invest in forests. Provides new financial structures. Could provide real scale. See COP30.

Investing in natural capital is a prime example of adaptation, mitigation, and development coming together.

90% of global investment opportunities in nature conservation and restoration from 2020-30 lie in developing countries, but **80% of such finance flows into developed economies** (Bhattacharya et al., 2023). Low cost and concessional finance is crucial.

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7 Key messages

Making it happen: the role of the state in leadership, setting strategy, and driving change

Transitioning to a sustainable economy involves a recasting of the role of the state, towards steering and fostering change at scale and pace. Delay is dangerous. Effective and purposive leadership is crucial in setting a clear and credible strategic direction, giving confidence to investors.

The state must foster change by harnessing the power of markets. State action must promote structural, systemic, and technological change, foster inclusive development, tackle market failures, and support private innovation, entrepreneurship, and creativity.

This requires:

- Avoiding misleading, narrow, crude assertions of what 'economics says', based on largely static and equilibrium theorising. A more subtle and dynamic economics is necessary. Time matters.
    a) Tackling market failures, combined with risk and urgency, necessitates not only price mechanisms such as carbon taxation but also **standards and regulation**.
    b) Thinking systemically: Systemic elements of the transition will require **economy-wide coordination** beyond that which the price mechanism alone can provide. Systemic and structural change can involve disequilibrium.
- Taking community and society seriously, nationally and internationally.
- Avoiding the traps and dangers of market and institutional fundamentalisms.
- Being watchful and thoughtful on potential government failure.

This is a market and entrepreneurial story, but the role of the state will be crucial in shaping incentives, setting expectations, and fostering entrepreneurship.

Leadership includes tackling errors in counter-arguments

The arguments of those who claim that an inevitable trade-off between climate action and growth does exist, first column, and how their reasoning falls short, second column.

Trade-off arguments

	Argument	Counter-argument
Concern 1	**In an efficient world, where market prices accurately reflect all relevant social costs, introducing an additional criterion** (here, future state of the climate) **must involve a reduction on some other dimension**, such as growth or poverty reduction.	**This position is not valid in a world with significant market failures.** Well-designed climate action can and should help overcome or reduce the many market failures and inefficiencies of relevance to climate change and climate action. The challenge of climate change provides extra motivation for addressing these failures (Stern and Stiglitz, 2023).
Concern 2	**Development needs energy, and energy needs fossil fuels**; therefore, development must involve increased greenhouse gas (GHG) emissions.	**While development generally needs energy, energy does not need fossil fuels.** Zero- or low-carbon sources are now cheaper than fossil fuels in many sectors and regions.
Concern 3	**Using resources for climate action will reduce those going to growth**, via physical or human capital, which would have reduced poverty and increased resilience.	**Well-designed climate action fosters investment and innovation in physical and human capital in cleaner and better ways, in turn driving growth, job creation, and resilience.** For example, investment in renewable energy infrastructure creates new work opportunities, reduces energy costs over time, promotes security, and creates new opportunities for innovation.
Concern 4	Climate action involves policies around pricing, technologies, and phasing out of fossil fuel extraction and use, which could **increase costs and reduce opportunities for poor people.**	**Well-designed policies can mitigate such effects and produce better outcomes.** For example, reducing inefficient and toxic subsidies frees up resources to invest for better growth and to compensate the poorest. Clean technology can be more inclusive, e.g. decentralised solar can empower small businesses.

Degrowth is not the way forward:
net zero will not come via zero consumption

There are hundreds of millions (or billions, depending on the metric) (World Bank, 2024) of very poor people in the world, and **it will be impossible for them to achieve high levels of human development and escape from poverty without substantial economic growth.**

Policies aimed at drastically reducing consumption in the name of emissions reduction and sustainability are unlikely to gain political traction.

The real challenge is to break the link between consumption and production on one hand, and emissions and environmental damage on the other. That is where the major changes must occur.

The key lies in producing and consuming in ways fundamentally different from the past. Even if pursued, a modest reduction in consumption would be, at best, a small part of the solution.

Making it happen: multilateralism and leadership

Tackling global challenges, particularly climate and biodiversity, requires multilateralism and international collaboration, with a focus on sustainable growth, innovation, and finance.

Centrality of MDBs and DFIs to support environment for investment, reduce risk, and bring down cost-of-capital. Countries can come together around these multilateral initiatives. Now is the moment to accelerate.

EMDCs: at the centre of the new growth story

- **The future of emission growth will now be in EMDCs (other than China)**, and these countries are embracing the debate on climate action.
- **Before the Paris Agreement, many developing countries saw climate action as a rich-country responsibility.** They feared it would hinder growth, development, and poverty reduction.
- **That perception is changing.** A key reason is the recognition that climate action can drive economic development and growth. EMDCs clean potential offers a unique investment opportunity.

India is moving fast: >50% of total installed capacity is non-fossil fuels, with target of 500GW renewable capacity by 2030 (Reuters, 2025)

The African continent

1. **Great clean potential:** holds 60% of the best solar resources in the world (IEA, 2022).
2. **Energy development needs:** 40% of its population lacks electricity access (IEA, 2023b).
3. **Huge expected population growth:** 10% global total (1960) to 30% (2050) (UNECA, 2024).
4. **Lack of investment:** accounts for 2% of global clean energy investment (IEA, 2023b).

If any country steps back in the international arena, it is likely that others will step forward into vacated space, making the most of new opportunities

European Union

The **Green Deal** is an example of how the public sector can encourage innovation and clean investments. For example, CBAM, green taxonomy, Horizon Europe, Green Deal Industrial Plan…

Critical that Europe unlocks its **innovative potential** to lead in the new clean technologies of this century. And supports EMDCs in their transition (e.g. via EIB and EBRD).

Report by Mario Draghi (2024) on integrating energy market and finance markets, and simplify regulation, charts a way forward.

China

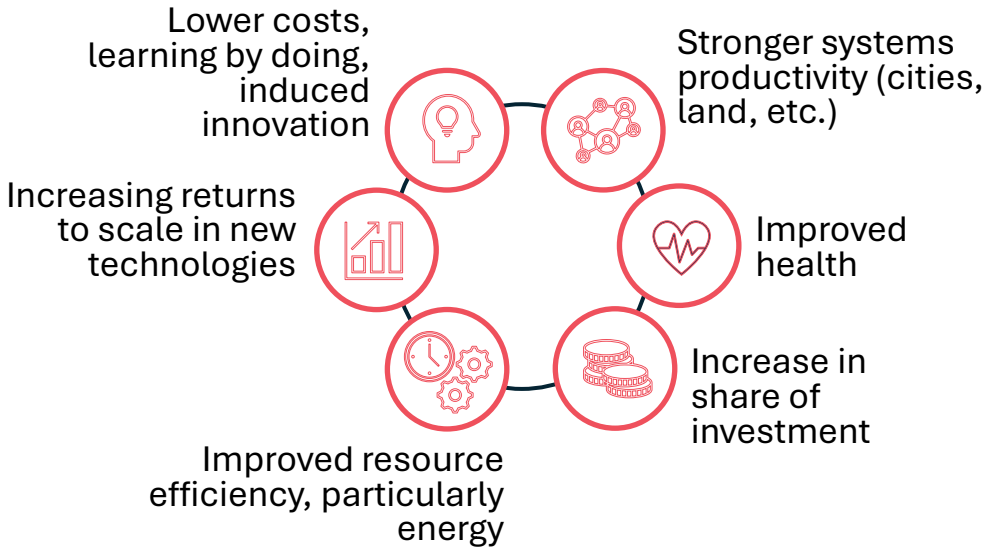
15th FYP (2026-2030) will be critical for the world's future – in terms of China's net-zero path and setting ambition. China's leadership will affect global power structures.

EMDCs can explore collaboration with China and other low-cost clean technology producers.

The growth story and the COP30 Action Agenda

How climate action drives growth

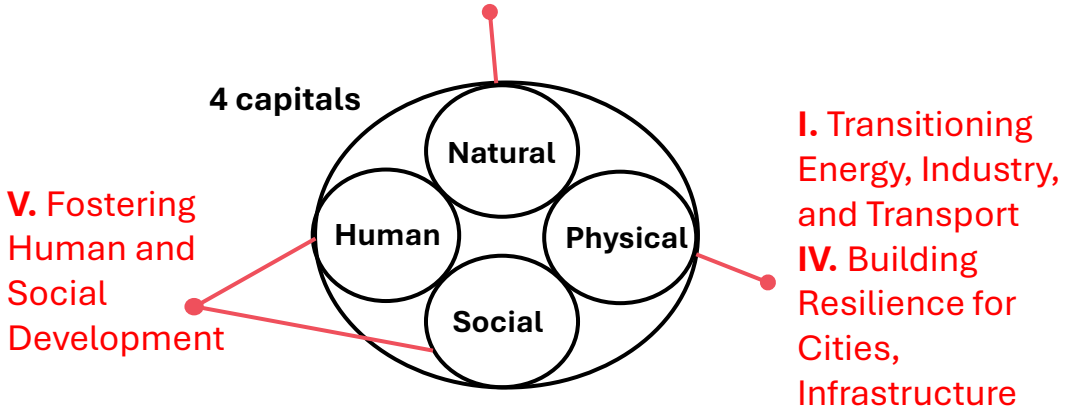
6 drivers of growth



Six axes and 30 key objectives

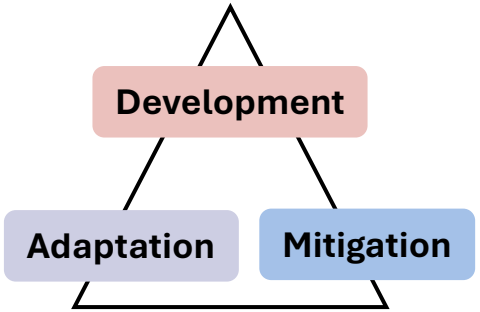
(as put forward by COP30 Presidency)

II. Stewarding Forests, Oceans, and Biodiversity
III. Transforming Agriculture and Food Systems



V. Fostering Human and Social Development

I. Transitioning Energy, Industry, and Transport
IV. Building Resilience for Cities, Infrastructure and Water



+Policy and structures for investment

VI. Cross-cutting issues - Unleashing Enablers and Accelerators, including on Finance, Technology and Capacity Building

Sustainability concerns future opportunities and they are shaped by:
Physical, human, natural, and social capital.

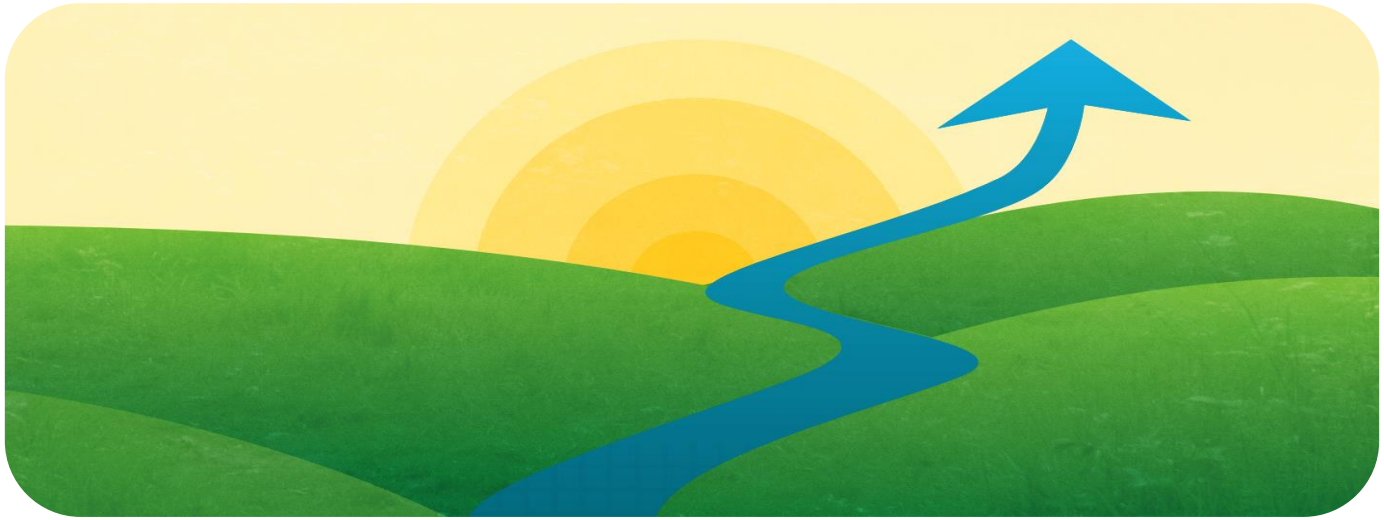
A story of collaboration and opportunity

Through international collaboration, transitions can be accelerated, costs reduced, competition and innovation fostered, and robust supply chains built. Investments in one region bring benefits across the world both in reducing climate risk and in driving sustainable growth. Centrality of the multilateral institutions, especially MDBs; they must embrace the agenda of a liveable planet and be "bigger, bolder, better" – see reports by International Expert Group chaired by NK Singh and Larry Summers for the India G20 Presidency, 2023.

Countries can share and shape the benefits of climate action. Action should be seen as investment with strong returns over a range of outcomes, rather than as a narrow cost. Duty of rich countries to both cut emissions quickly and support EMDCs in fostering and financing investment given that past emissions have made development more difficult. And it is in rich country self-interest, e.g., by reducing future migrations.

Restoring trust particularly between richer and poorer nations.

Through creating the conditions for investment and providing low-cost and readily accessible finance.



Understanding **self-interest and shared interest** through lens of **the opportunities of the growth story**.

Accelerating this new growth story is particularly attractive in the context of a world stuttering for growth.

There is an intergenerational duty in the striving for sustainable development for future generations. And there is a right to development for everyone now and in the future. The opportunities of climate action make the force behind delivery from all countries, particularly rich countries, on our moral duty even stronger.

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It can be done

A special opportunity to deliver at scale
The world economy needs a boost to growth
and it can and must be sustainable

No shortage of potential global savings in relation to investment. Search for stronger and more sustainable growth driven by stronger investment.

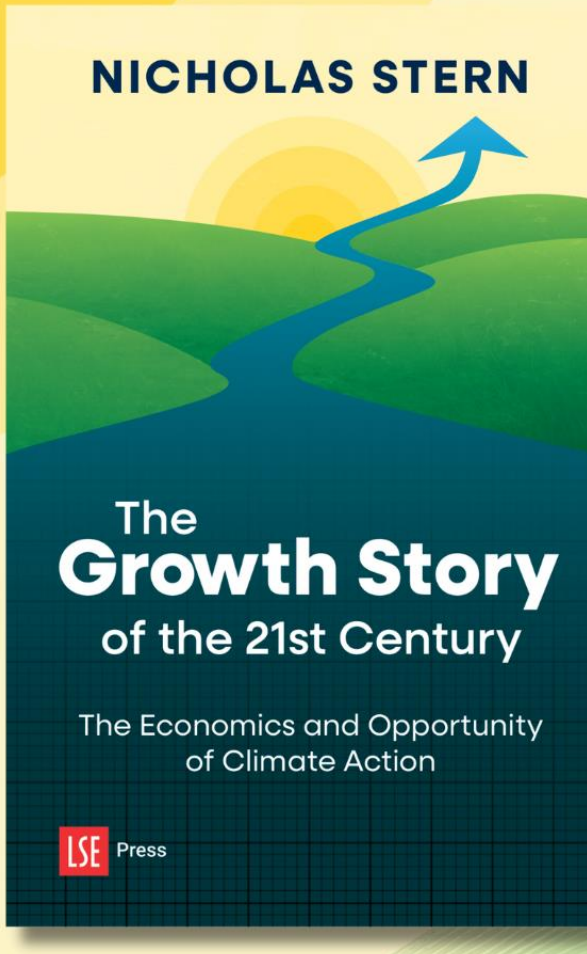
The technology is advancing so rapidly that we now have extraordinary opportunities in our hands.

International agreements have **provided political direction** and evidence that collaboration is possible.

We have in our hands an attractive, sustainable, resilient, and inclusive form of growth and development. Do we have the political capability, strength, and wisdom necessary to take the opportunity and to avoid a catastrophic future?

I am optimistic about what we can do but deeply worried about what we will do. Our task is to help turn "can" into "will".

Seizing the opportunities requires rapid and fundamental change. Much of what we currently do will have to be done differently (technologies, institutions, business models, city planning processes, natural resource management…). But the outcome will be a much more attractive form of growth and development, which is sustainable and resilient.



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Key messages (I)

The next decade is critical to keep the Paris Agreement targets within reach. Emissions are still rising. Mounting scientific evidence pointing to still earlier and more severe climate effects. Tipping points (coral, ice sheets, Amazon system, permafrost, AMOC, etc.) are ever closer. Delay is dangerous; would be a fundamentally unrealistic strategy. A moment of great risk and great opportunity.

The new growth story of the 21st century embodies six key drivers: innovation; economies of scale; efficiency; systemic changes; health improvements; and the significant investment increases required for a rapid and comprehensive economic transformation in technologies, structures, and systems. Investment is at the core of the new growth story.

Robust policies and institutions are needed to create a stable and encouraging investment climate and tackle a broad range of market failures, including concerning greenhouse gases, R&D, capital markets, networks, information, health. Involves recasting of role of state.

Finance is of fundamental importance. EMDCs are being left behind in many critical aspects of the transition. The world now requires, for delivering on the crucial goals of the Paris Agreement, a new climate finance framework that supports global climate action and sustainable development.

Major expansion of multilateral finance system is necessary, including a tripling of finance from MDBs by 2030, their closer working with private sector, and finance available to EMDCs at an affordable cost (risk management, sharing, and reduction are crucial).

Key messages (II)

Sustainability requires investment in all forms of capital: physical, human, natural, social. Adaptation and resilience now critical challenges. Development, mitigation, adaptation, interwoven and mutually supporting. Tackle climate and biodiversity crises together; get resources behind natural capital.

Multilateral collaboration is essential to tackle climate change and achieve sustainable growth, with the success of this transformation resting also on innovative economic thinking and decisive political leadership.

Multilateralism is under threat. Lack of trust from Covid, wars, recent behaviour of USA around tariffs and trade and withdrawal from WHO and Paris agreement.

Opportunity for EMDCs and China to move to leadership and support internationalism. China's actions driving investment, innovation, and finance can help developing world to pursue clean development. Push for MDB expansion: bigger, bolder, better. And for Asia to move closer together. Opportunity and duty for Europe to lead.

EMDCs can lead the growth story. Many can leapfrog to a new form of development. Huge clean potential in Africa.

We have the economic understanding, technologies, and ingenuity to create this new form of sustainable, resilient, and equitable development and to avoid climate catastrophe. But do we collectively have the political will, skills, and cohesion to deliver? Challenge is to transform what we "can do" into what we "will do".

For references see
Nicholas Stern (2025) The Growth Story of the 21st Century. The Economics and Opportunity of Climate Action. Published by LSE Press. DOI: https://doi.org/10.31389/lsepress.tgs