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This report distills the outcomes of the eighth in a series of symposia on human welfare in emerging markets at Green Templeton College, Oxford. This symposium like its seven predecessors was made possible by the vision and very generous sponsorship of the C&C Alpha Group, for which the College is deeply grateful.

The report is published at a turbulent and troubling moment in the history of international efforts to meet and manage the challenges of environmental change. In light of recent denials of overwhelming scientific evidence, there is now widespread concern about the lack of commitment in some quarters to take urgent action. Indeed, those who are suffering the direct and indirect consequences of toxic smog, creeping desertification and other threats in parts of Asia and Latin America, are already aware of the impact of air pollution, ocean and freshwater contamination, reduced biodiversity and soil degradation.

No aspects of environmental change are more critical than those that affect health and well-being; none are more urgent than those that affect the poor and disadvantaged; none can be managed without global cooperation that puts the welfare of the world above that of individual countries; and nowhere are the consequences more threatening and evolving faster or on a larger scale than in emerging markets.

The report accepts that environmental threats pose a clear and increasingly acute danger to human health in emerging markets and the world at large. It recognizes that the current trajectory of environmental damage, depletion and degradation is unsustainable. It argues that planetary health, sustainable growth, social cohesion and political stability demand wise stewardship of our limited planetary resources. It acknowledges the need for measured but significant changes in attitudes, lifestyles, modalities and priorities to reconcile economic ambitions with the capacity of the earth’s natural systems. It urges greater global emphases on public health and disease prevention, waste-reducing cyclical economies and the adoption of satisficing objectives. And it suggests that plausible solutions will require a transformation of the approaches which underlie decision-making away from the substantial degrees of corporate and individual environmental autonomy that currently prevail in much of the world towards a sustainable blend of realistic environmental controls and enhanced cooperation.

I welcome this report as a serious and thought-provoking contribution to the debate on the future of our planet, the most important issue facing mankind.

Professor Denise Lievesley
Principal, Green Templeton College, Oxford
The Emerging Markets Symposium (EMS) is an academic initiative of Green Templeton College, Oxford that expresses the College’s commitment to enhance the management of human welfare in the modern world.

The EMS was created in 2008 because: (i) The prosperity of emerging markets is critically important to the world of the 21st century; (ii) Complex and urgent issues of human welfare and well-being, if not resolved, would constrain their growth, cohesion and stability; (iii) No existing forum was dedicated to these issues and; (iv) Green Templeton College had the convening power to gather leading authorities from national governments, international institutions, business and civil society organizations to consider issues and recommend practical changes in policies and practices that could help resolve them.


For more information about the Emerging Markets Symposium please see: ems.gtc.ox.ac.uk

For more information about Green Templeton College please see: www.gtc.ox.ac.uk
SUMMARY

This is a summary* of the findings, conclusions and recommendations of a 2017 symposium at Green Templeton College, Oxford. The symposium was predicated on the assumptions that problems of environmental health in emerging markets must be: considered in the context of planetary health; viewed through the prisms of environmental and health sciences, economics, politics, anthropology, sociology, geography, history, and philosophy; and addressed in the nexus of the human life-course and the policies, practices, initiatives and interventions of government, business and civil society.

*The Full Report from the symposium on Health and the Environment in Emerging Markets is available on the EMS website: ems.gtc.ox.ac.uk
EMERGING MARKET PERSPECTIVES

WHAT ARE EMERGING MARKETS?

Since the term was coined in 1981 to describe some middle income countries in Africa, Asia, Europe and the Americas as ‘emerging markets’, the set of countries so recognized by the EMS, while not immutable, has remained unchanged since 2008. It includes: Argentina, Brazil, Chile, China, Colombia, Egypt, India, Indonesia, Jordan, Malaysia, Mexico, Pakistan, Peru, Philippines, Poland, Russia, South Africa, Thailand, Tunisia and Turkey.

Emerging markets are in many ways diverse but from a high-altitude perspective have enough in common to allow us to consider them as a distinctive group and to speak of them in the same breath. Their defining generic accomplishments include:

- The capacity to manage demographic transitions attributable to declining fertility and increasing longevity that (with exceptions) are reflected in broadly similar population pyramids;
- The capacity to manage economic, social, cultural, technological and spatial change;
- Moderate to strong (in some instances very strong) economic growth driven by domestic and foreign fixed and financial investment;
- Sustained economic and social development measured (inter alia) by moderate to sharp reductions in infant mortality, illiteracy and communicable diseases;
- Distinctive but relatively stable polities with relatively effective governance and judicial and financial systems;
- Comparatively adequate but unevenly accessible primary education systems and partially adequate secondary and tertiary education systems;
Sharply stratified (excellent to very weak) healthcare and public health services;

Sufficient economic power and external influence to become significant players in regional and in some cases global geopolitics.

From the same (high altitude) perspective, their generic challenges include:

Unresolved problems of national, local and corporate governance, including systemic abuses of power and authority, uneven leadership and managerial competence;

Eroding competitive advantages in trade, manufacturing and other economic activity reflecting rising factor prices;

Unresolved problems of income, education and health poverty, economic inequality, social inequity and other determinants of human welfare and well-being; and (crucially for this report) unresolved problems of cumulative environmental damage.

EMERGING MARKETS IN THE WORLD

In the last quarter century, the benefits and costs of economic globalization (i.e. integration, standardization, digitization, specialization, technological and organizational change, factor mobility) and associated processes of cultural and political globalization have been disproportionately concentrated in emerging markets. The benefits have been transformational, the speed of change unprecedented, the cost unsustainable. Surging globalization after c.1980 was roughly correlated with progressive poverty reduction and increased inequality in emerging markets. Good news for some, not so good for others;

Figure 2: Total life expectancy and healthy life expectancy at birth (total years.) Data from 2014 (Total life expectancy), 2015 (healthy life expectancy)

Healthy life expectancy: “Average number of years that a person can expect to live in “full health” by taking into account years lived in less than full health due to disease and/or injury.”

HIC: High Income Countries (sample), LIC: Low Income Countries (sample)
Figure 3: Life expectancy at birth, 1990 and 2014
Source: EMS 2017 Analytical Framework
HIC: High Income Countries (sample), LIC: Low Income Countries (sample)

Figure 4: Children under 5 mortality ratio (deaths per 1,000 live births), 1990 and 2015
Source: EMS 2017 Analytical Framework
not because all those left behind were materially worse off but because they fell relatively further behind. Never before have the lives of so many people been so quickly advantaged or, because the tide of prosperity has left many behind, so thoroughly and comparatively disadvantaged. And never before has so much damage been done in such little time to the earth’s natural systems.

In emerging markets, as in rich countries, accelerated growth and development has widened gaps between haves and have-nots. Not because they sought them (although policies may have made them inevitable) but because they were unintended consequences of rapid growth. Just as rising tides may not lift all boats, economic growth in nation-states is unlikely to lift all people, not least because some people think equitable outcomes are unfair, unattainable or unachievable even if government, business and civil society are nominally and/or actually committed to them.54

Leaders and representatives of emerging markets have argued for years that their countries face bigger challenges and harder choices than others because they are simultaneously expected to:

- Promote economic growth;
- Improve the welfare and wellbeing of whole populations;
- Foster social and economic mobility for the disadvantaged;
- Address the specific needs of vulnerable populations including the youngest and oldest;
- Improve the availability and quality of health and education; and
- Manage ecosystem risks.

Yet these challenges are essentially similar to those faced by rich countries in the 19th and early 20th centuries some of which, in some degree, continue to face them. The difference is that emerging markets must face them with fewer resources, less infrastructure, less administrative, legal and financial capacity and weaker governance. Although current trends in some rich countries point to diminishing protection for the poor, more emphasis on autarchy and less on global collaboration, poor emerging market populations are, in almost all respects, worse off than their rich country counterparts.
A GLOBAL PERSPECTIVE

This report reflects the symposium’s answers to four questions:

- What has happened to the global environment?
- Why did it happen?
- How has environmental change affected human health in emerging markets?
- What can be done about it?

WHAT HAS HAPPENED (OR WHAT HAVE WE DONE WRONG)?

Essentially three things. First, we have failed to adequately protect the earth’s natural systems. Second while our knowledge of the environment has greatly increased, particularly since the late 20th century, we do not yet fully understand some aspects of those systems. Third, those who understand the systems well have not persuaded those who understand and treat them less well to treat them better.

Doing

The Anthropocene Epoch began in August 1945 with nuclear explosions that ended World War II. Post-war recovery was followed by consumption-driven growth that brought unevenly distributed prosperity to much of the world but also degraded, depleted and destroyed natural systems at unprecedented speeds on unmatched scales. Economic growth since the mid-20th century (particularly in the last 25 years) has brought unprecedented improvements in health, nutrition, education, social mobility, DALYs and other measures of human welfare and well-being to much of the world. Humanity is healthier, better educated, better housed and has better access to utility and human services than ever before. Partly because the benefits of growth have been spread through rising household and personal incomes and partly because investments and other interventions by government, business and civil society have generated numerous benefits. But while the world as a whole has never had it so good the bottom billion has been left behind. If that is the mostly good news consider also the price of progress, in the name of which we have: converted (see Rockefeller(2015)) about a third of the earth’s ice and desert-free surface to cropland or pasture; appropriated half the world’s annual supply of freshwater for human use; cut down more than 2·3 million km² of primary forest since 2000; harvested about 90% of the world’s monitored fisheries at or beyond maximum sustainable limits; dammed more than 60% of the world’s rivers; eliminated species at a 100 times faster rate than that revealed in the fossil record; halved vertebrate populations since 1970; contributed to the highest concentrations of carbon dioxide, methane, and nitrous oxide in at least 800,000 years; used more than 100,000 chemicals (many untested and with unknown health effects) to produce pharmaceuticals; abetted solid waste mismanagement to blight urban peripheries across the world; allowed recyclable materials to spoil the soil for future generations; and celebrated our achievements as agents of biophysical change by naming the Anthropocene Epoch for ourselves. (see BOX 6, page 27).
On April 22, 1970, before conservation was popular anywhere, an American cartoonist boldly suggested that, whereas most people thought environmental change was a function of evolving natural systems, it was actually attributable to human interventions (Figure 5). Forty five years later, many of those who understand the issues are convinced that man is his own worst enemy and the game clock is running down.\(^{S11}\)

**Knowing**

In 1990, the US National Academy of Sciences observed: “for many of the human activities that are transforming the global environment... data and analyses are fragmentary, scientific understanding is incomplete and long-term implications are unknown”.\(^{S12}\)

In the last quarter century, science has come a long way. Not to a perfect understanding but far enough to persuade many governments, businesses and civil society organizations that multiple environmental threats could lead to the end of life as they know it and, in a Doomsday Scenario, to the end of life on earth.\(^{S13}\)

**Persuading**

Finally, there is the matter of persuasion. With honourable exceptions, failures to address the health implications of environmental change reflect neither a lack of scientific evidence\(^{S15}\), nor a lack of effort to show that threats to environmental health are truly existential. Above all, they reflect failures by world, national, regional and local leaders to endorse the value of scientific expertise; evangelize environmental threats to planetary health; and understand that if public opinion resists reasoned arguments (logos), ethos and pathos are legitimate options (BOX 2).

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**Figure 5: We have met the enemy and he is us**

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**Box 2:**

Persuasion

Of the modes of persuasion furnished by the spoken word there are three kinds.

The first kind depends on the personal character of the speaker [ethos]; the second on putting the audience into a certain frame of mind [pathos]; the third on the proof, or apparent proof, provided by the words of the speech itself [logos].

Persuasion is achieved by the speaker’s personal character when the speech is so spoken as to make us think him credible.

Aristotle, Rhetoric, 4th Century BC.
WHY DID IT HAPPEN?

The debate on the recent evolution of the global environment has generated both heat and light. Fingers have been wagged, pointed and curled in to fists. And to the extent they have formed sides, each has judged the other with perhaps less than due allowance for the fact that lack of knowledge, insight and foresight is part of the human condition.

It is easy for some to say (as some have said), that environmental damage is a consequence of greed, impatience and the mistaken belief the world’s resources are infinite. It is easy for those who may have misused the planet to point out that without their willingness to take risks and push boundaries, the world would have made less material progress. Yet even those who may be guilty of causing grievous environmental harm recognize that the environmental movement which originated in the 1960s as a disgusted response to the perception that mankind had fouled its nest, has added value to society. The movement spread in the 1970s and 80s and achieved global reach in 1990 when Earth Day was celebrated in 143 countries. As it grew, it gradually engaged government, business and civil society, began to capture public opinion and began to influence household and individual behaviours.516

Air quality was the movement’s first concern.517 But by the 1980s the focus had shifted to the risks of climate change, the nature and magnitude of which were considered at Rio de Janeiro, Kyoto and Copenhagen.518 Efforts to agree on cohesive intergovernmental standards were, at best, difficult and were not helped by those who denied the findings of environmental science and often ignored environmental scientists.

December 12, 2015 when the Global Climate Change Agreement was signed in Paris, was an extremely important day in the history of global collaboration. It proved the global community was willing to: play a new development game; replace the adversarial agendas of previous environmental debates with collaborative agendas; believe the time for inaction, prevarication, opposition and asymmetric approaches to environmental threats was over;519 accept it was time to subordinate national priorities to global imperatives; and, before it was too late, decarbonize the global economy to pre-industrial levels by the middle of the 21st century. The Agreement has yet to be implemented and needs enhancement; emerging markets and, perhaps more so, rich countries, have much to learn from these processes.

HOW HAS IT AFFECTED ENVIRONMENTAL HEALTH?

Stylistic differences aside, high income neighbourhoods with high-end services in Buenos Aires, Marrakesh or Bangkok are not so different from those in Brussels, Madrid or Chicago. Building materials aside, slums in Delhi are much like those in Bogotá. And emerging markets have the non-communicable diseases of the poor and the chronic diseases of the rich.

Problems of environmental health are among the most paradoxical, urgent and challenging of the many ‘wicked’ problems520 facing emerging markets today (BOX 3). Because specific challenges demand specific strategies, most of them must be resolved by emerging markets themselves. But because many environment-related diseases, like many aspects of environmental damage, are too complex, dispersed and mobile to be addressed by any one country, international action is, in many cases, Hobson’s choice.521 Environmental health problems, and tactics, strategies and opportunities to resolve them522 demand both global and local thought and global and local action.
Deficient housing, overcrowding, poor sanitation and polluted air and water are relatively pervasive in poor countries and (mostly on smaller scales) also persist in poor emerging market communities. In both, they create conditions where infectious diseases, including malaria, HIV, pneumonia, tuberculosis, gastro-enteric infections and neglected tropical diseases, spread quickly and can be hard to contain although healthcare and public health services in emerging markets, even in poor communities, are generally better than in poor countries. The epidemiological shift from mainly communicable to mainly non-communicable diseases that was largely completed in rich countries before 2000 when it had barely begun in poor countries is still underway in emerging markets. They are thus caught betwixt and between.

Nonetheless, non-communicable diseases account for growing shares of morbidities and mortalities, many of them attributable to environmental causes. As in the rich world, cardio-vascular and respiratory diseases, cancers and diabetes are all linked to air and water pollution while mental and neurological diseases are directly or indirectly tied to urban stress, cultural dislocation and isolation particularly in emerging market megacities where it is hardest to identify and manage them.

The distinguishing features of environmental health in emerging markets are that:

- Environmental health challenges are larger and are evolving faster than in other countries.
- Some problems are derived from rich countries.
- Some aspects are not well understood including zoonotic diseases (e.g. ebola, malaria, zika) that account for 75% of new and emerging infectious diseases.
- Environmental health in emerging markets reflects welfare disparities, skewed distributions of wealth and incomes, limited economic opportunities and disadvantaged access to health, education, infrastructure, housing and services.
- Environmental health conditions vary enormously between and within emerging markets and in some cases, are worse than in poor countries.
- Response capacity is weaker than in richer countries because institutions are generally less established, skills and technical knowledge are less available and funds are scarcer.
- Political environments, especially at local levels, may not be amenable to decisive action because there is intense competition for leadership attention and less interest in addressing long term problems.

**WHAT CAN BE DONE ABOUT IT?**

Disputes aside and no matter who is responsible, the reality is that the global community cannot continue to use the planet as though, when it no longer serves, they could migrate to another. So what can be done about it?

One option is to recognize that neo-liberalism has made it possible to nourish, house and clothe more people, create jobs and incomes and permit rising living standards for much of (but by no means all) the global population and to assume it will continue to work. Another option is to adopt an alternative model such as the so-called ‘Boundaries Model’ developed by Rockström et al, Raworth and Steffens et al.
Raworth\textsuperscript{26} suggests that if the 21\textsuperscript{st} century is to meet the needs for food, water, energy, shelter and material goods of almost 10 billion people without adverse effects on air quality, climate, soils, biodiversity, freshwater and a protective ozone layer, it must inhabit a ‘doughnut’-like safety zone between social and planetary boundaries (see Figure 6) in which the twelve dimensions of the social foundation correspond to standards identified in the Sustainable Development Goals\textsuperscript{27} and nine planetary boundaries represent the limits beyond which the earth’s natural systems will not go on giving. Indeed, Steffens et al suggest that some boundaries (climate change, biosphere integrity, land-system change and phosphorus and nitrogen use) have already been crossed and that the consequences are potentially devastating.

None of those potential consequences are more important than those considered in this report because human fertility, productivity, educability, creativity, ingenuity, adaptability and destructive capacity fundamentally depend on human health and well-being that, in turn, depends on symbiotic relationships between men, women, children and their natural and built environments.

And they are nowhere more important than in emerging markets which are among the leading perpetrators and major victims of environmental harm.
THE GOLDEN EGG

Environmental degradation, destruction and depletion in emerging markets are collateral consequences of rapid economic growth and social development that has been achieved by consuming natural resources at rates that, if continued, would exhaust them. As Haines points out, “We… have mortgaged the future in order to sustain our current level of health and development.”

That does not mean past relationships between economies and environments offer blueprints for the future. Future demand for energy for example, will not increase pari passu with economic growth because technologies will change, production and distribution systems will become more efficient, lessons of past experience will be learned and Santayana’s aphorism – “Those who cannot remember the past are condemned to repeat it” – will be heeded.

The critical and exceedingly difficult question for emerging markets is how to reconcile the urgent need to spread and increase prosperity while diminishing and eventually eliminating environmental threats that, unchallenged, will undermine economic growth. There will be an overwhelming temptation to ignore the longer term, focus on the short term and kill the injured goose that laid golden environmental eggs by dismissing Aesop’s warning, “Much wants more and loses all.”

Because natural systems – air, water, oceans, land, biodiversity, climate – are not confined within national boundaries, growth-driven threats to natural and built environments are universal. But the need for radical changes in priorities and behaviours is disproportionately greater in emerging markets than in other countries and the risks of financial, social and economic disruption are greater there than elsewhere. While the nature of environmental damage in emerging markets is essentially similar to environmental damage in rich countries, its scale has generally been larger and its rate faster in emerging markets than elsewhere.

AIR

Air pollution was a global environmental priority until it was eclipsed by climate change. Since c.1980 air quality in cities and – more than often supposed – rural areas, has deteriorated worldwide. Both urban and rural air pollution is worse in emerging markets than anywhere else. Partly because the world’s megacities (except London, Los Angeles, New York, Paris and Tokyo) are mostly in emerging markets; partly because problems of rural air quality are highlighted by pollution associated with the destruction of the Amazon rainforest; and partly because there have been substantial increases in SO2 and NOx emissions. Emerging markets have also suffered increases in premature deaths linked to urban air pollution (particulates and ground-level ozone) and high burdens of disease from exposure to hazardous chemicals.
ENVIRONMENTAL HEALTH IN EMERGING MARKETS – SUMMARY

WATER

The pollution and toxification of freshwater and ocean water is greater in emerging markets than in richer countries. Partly as a function of behavioural norms: where else to bathe or wash clothes; why should cows not defecate in rivers; what is wrong with dumping solid wastes and plastic bottles in oceans? And partly because waste management infrastructure and services are weaker. Many emerging markets have high levels of groundwater pollution and depletion; growing populations living in river basins under severe water stress; deterioration of surface water quality; increases in nutrient loading and risk of eutrophication; relatively large rural and urban populations without access to safe water (partly because urban populations have grown faster than water service connections); and increases in untreated wastewater.

BIODIVERSITY

Science has described only a fraction of the world’s estimated 15 million to 100 million species. And because the global distribution of biodiversity is geographically uneven and because emerging markets enjoy species richness and species endemism, they also enjoy economic privileges and (in principle) globally significant custodial obligations. As a result, emerging markets face intensifying internal pressures to prioritize growth and increasing external pressure to prioritize biodiversity.

Emerging markets have experienced a continued loss of biodiversity from growing pressures of land use and climate change and a decrease in primary (virgin) forest area. Biodiversity is also eroding faster, on a larger scale and with greater long term implications in emerging markets than in rich countries as pressures to increase returns on capital and expand economic activities in the context of weak environmental protection, have depleted biodiversity and exploited natural resources with disproportionate impacts on the welfare and livelihoods of the rural poor, particularly those most reliant on the natural world.
SOIL

Limited access to education, extension services and productivity enhancing techniques and the abusive use of pesticides, herbicides and fertilizers and weak regulation of farming practises in emerging markets mean many of their vast acreages of agricultural and livestock farming land yield comparatively poorer returns and faster rates of soil depletion and degradation (with multiple knock-on effects) than in rich countries. Rising pressures will raise the spectre of further deforestation, soil exhaustion and severe consequences for food production, nutrition and health in emerging markets and, to the extent it depends on them, the rest of the world.

CLIMATE

Growing greenhouse gas (GHG) emissions (especially energy-related CO₂) and growing atmospheric concentrations of GHGs mean the impact of climate change will be greater in emerging markets than in rich countries (although not necessarily greater than in poor countries).

Some rich countries (notably Japan, Netherlands) are vulnerable to sea-level rise but world attention is mainly focussed on threats of coastal erosion, coastal flooding and population displacement in poor countries (e.g. Bangladesh, Myanmar, Vietnam). Many emerging markets, particularly in east and south Asia (e.g. China, Indonesia, Malaysia, Thailand, Philippines) are also at risk of predicted coastal flooding.

Other emerging markets (in Latin America and Asia) are threatened by predicted increases in the frequency and severity of extreme weather events, including river flooding, soil erosion and damage to housing, urban infrastructure, irrigation systems and dams from hurricanes, cyclones and intense rainfall. And given their geographic locations, parts of many other emerging markets (e.g. Chile, China, Morocco, Egypt) are exposed to the effects of rising temperatures, high insolation levels, drought and desertification, although – subject to breakthrough transmission and storage technologies – most of them could, in due course, become major producers of solar energy.

BUILT ENVIRONMENTS

By comparison with rich countries, built environments in emerging markets have poorer housing and infrastructure, larger transmission and distribution leakages and losses, less efficient transport, fossil-fuelled electric power, more untreated solid and liquid waste and damaged infrastructure. As a result, their cities are more polluted, have poorer drainage and weaker environment education programmes than cities in richer countries.
SCENARIOS

So, which do you prefer… the end of the world as we know it or the end of the world? Anon

The outlook for environmental health in emerging markets largely depends on the impact of the global economy on the global environment in the last and next 35 years. It can be argued that errors of omission and commission since c.1990 have already settled the outcomes and that environmental damage done cannot be repaired. The burden of evidence suggests the damage is significant but not determinantal.

There are two plausible scenarios for 2050. Both exclude wars, epidemics, asteroid strikes, volcanic eruptions and environmental calamities beyond those embedded in recent and current trends. Both focus on tensions between growth and development and the environment (Figure 8).

THE ‘PARTY ON’ SCENARIO

Blending the buoyant optimism of Voltaire’s Candide with the dystopian realism of Sartre’s Huis Clos, the ‘Party On’ scenario would feature increasing tensions between economic growth (and social development) and collateral environmental damage.

Upside

In the upside of this scenario, followers of Voltaire’s ultimate optimist, Dr. Pangloss, would assume the unprecedented growth and development of the last 35 years in emerging markets (and to a generally smaller extent) elsewhere, would be sustained or accelerated; that damage to natural systems would not have to be paid for; and that further environmental damage would be avoided.
A recent analysis suggests that in these conditions, world population would grow from ±7.0 billion to ±9.0 billion, largely driven by ageing and largely concentrated in towns and cities.\(^5\)\(^3\)\(^5\) The size of the world economy would nearly quadruple. Demand for energy, food, water and agricultural land would increase as consumption preferences changed with rising incomes.

In 2015, the largest emerging economies (Brazil, China, India, Indonesia, Mexico, Russia and Turkey, a.k.a. the ‘E7’), were about half the size of the G7 economies (having been roughly a third the size in 1995).\(^5\)\(^4\)\(^6\) The analysis suggests that by 2030, China would become the world’s largest economy and India the second largest.\(^5\)\(^7\) By 2050, the E7 would be twice as large as the G7 economies and would account for around half the global economy and six of the world’s seven largest economies, displacing all but one member (the USA) of what is now the G7.\(^5\)\(^8\)

The long term economic prospects of the world would be intensely and increasingly relevant to emerging markets, not least because the reversal of fortunes that, in the recent past, has made some rich country investments hostage to the availability of emerging market capital (mainly from China and India) could continue. Whereas the prosperity of today’s leading economic powers hinges on continued growth in emerging markets, by 2050 the tables would be partially turned and emerging markets would be looking for sustained growth in the now richest countries.

**Downside**

The downside of the *Party On* scenario is that continued efforts to achieve growth and development in emerging markets (and the world-at-large) would be increasingly constrained by problems of environmental health and human welfare (Figure 9). The goose would stop laying golden eggs and efforts to pursue growth and development without significant changes in economic and environmental policies would be stymied by their environmental and health consequences.
Because unprecedented economic and demographic growth since the 1940s has delivered enormous (but far from universal) human benefits at the cost of severe environmental damage, more of the same would lead to irreparable environmental harm. A ± 30% larger (and, except in Africa, significantly older) population, pursuing unrestricted growth without deliberate changes in technology, organization or consumption patterns would probably do more environmental harm than past growth, put natural systems under unsustainable pressure and exacerbate problems of air and water pollution, waste management, biodiversity loss and climate change. The OECD has described the result as “irreversible changes that would endanger two centuries of rising living standards”, and also suggests that:

- Without changes in consumer food preferences (including much reduced demand for red meat), growing demand for food would expand cultivation, degrade soils, increase deforestation, deplete fish stocks, increase waste and increase demand for energy, mainly in emerging markets, by 2050.

- The urbanization of ± 70% of world population (at a rate 200,000 people a day) would increase problems of air and water pollution, transport congestion and waste management, mainly in emerging markets.

- World energy demand would increase by 80% most of which (± 85%) would be met with fossil fuels. Emerging economies, particularly the largest, would become more energy-intensive.

- Disruptive climate change would accelerate. Global greenhouse gas (GHG) emissions would increase by 50% as CO₂ emissions rose. By 2050, atmospheric concentrations would reach almost 700ppm; rising global average temperatures would lead to an increase of at least 3° over pre-industrial levels; and extreme weather events and higher heat, insolation, rainfall, glacial melt and sea-levels would present intolerable threats.

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**Figure 10: Global water demand: Baseline scenario, 2000 and 2050**  
*Source: OECD (2012)*

BRIICS: Brazil, Russia, India, Indonesia, China and South Africa, RoW: Rest of the World

Blue water demand only.
Changing land uses, expanding commercial forestry, infrastructure development, encroaching human settlements, fragmenting habitats, pollution and climate change, would diminish biodiversity especially in Asia, Europe and Southern Africa. Further losses in freshwater biodiversity could also threaten human well-being, especially for the rural poor.

Freshwater availability would diminish and water-related tensions would rise in many parts of the world, including emerging markets in North and South Africa and South and Central Asia. Growing demand for water from manufacturing, power generation and domestic use would increase global water demand by ±55%, limiting scope for increased irrigation. Groundwater depletion could become a major threat to agriculture and urban water supplies. Nutrient pollution from urban wastewater and agriculture would worsen in most areas, intensifying eutrophication and damaging aquatic biodiversity.

Access to improved but not necessarily safe water would continue to increase, particularly in emerging markets but not in much of sub-Saharan Africa. By 2050 at least 15% of the world population would still lack basic sanitation.

Environmental and demographic changes in this scenario would present new challenges to environmental health in emerging markets. Communicable disease issues would include:

- Child health would continue to be threatened by environment-related perinatal illnesses (low birthweight, stillbirths, congenital anomalies); respiratory diseases (pneumonia, tuberculosis, asthma); diarrhoeal diseases (rotavirus, E. coli infections and cholera); and vector-borne diseases (especially malaria);
- Population ageing would increase the prevalence of age-related morbidities; pose acute cost-benefit questions to society; and increase threats from ground-level ozone;
- Although some infectious diseases (e.g. zika) are imperfectly understood, environment-related communicable diseases would continue to confront scientists, doctors and patients;
- As emerging market cities continued to grow, deficient and overcrowded housing and poor sanitation would foster the spread of known and neglected tropical diseases in poor urban communities;
- Drug-resistant infections could wreak more economic damage than the 2008 financial crisis;
- PM2.5 exposure would become the leading cause of premature environment-related death, particularly in Asia where concentrations already exceed safe levels; and
- Exposure to hazardous chemicals would increase as emerging markets captured growing shares of chemicals markets.

Among other downside aspects of this scenario many non-communicable diseases, mainly or partly attributable to environmental causes, would account for growing shares of morbidities and mortalities in emerging markets:

- Cardio-vascular and respiratory diseases, cancers and diabetes would increase as air and water pollution persisted.
- Mental and neurological diseases linked to urban and rural stress, dislocation and isolation would increase, particularly in emerging market megacities.
Environmental health in emerging markets would continue to reflect skewed distributions of wealth and incomes, limited economic opportunities and disadvantaged access to health, education, infrastructure, housing and services.

Environment-related disease would continue to be unevenly distributed. The worst-off would continue to bear the brunt of socially determined morbidity and mortality. Depending on the speed of environmental degradation the response capacity of emerging markets would diminish and would continue to lag richer countries.

And it could be worse, because:

- The world will have ± 2.0 Billion more people in 2050 than it has now. While much of the growth will be in Africa, some will be in poorer communities in emerging markets. Wherever it occurs, more people would put more pressure on natural systems.

- The Global Climate Change Agreement of December 2015 was an extraordinarily important achievement. In light of the fact that failure to meet the Agreement’s obligations by any of the major countries threatens the targeted global warming cap of 2.0ºC by 2100, the US decision to withdraw could have catastrophic implications. Uncertainty in the interim could see global warming veer upwards with unknown consequences for natural systems and planetary and environmental health.

- The environmental health implications of rapid environmental change could be more severe and more complex than in the past. For example, Margaret Chan has suggested that the growing global problem of antibiotic resistance could be disastrous for human and animal health, food production and global economies; penalize the poor; bring the end of modern medicine as we know it… and make “sophisticated interventions, like organ transplantation, joint replacements, cancer chemotherapy, and care of pre-term infants more difficult or even too dangerous to undertake”.

- While we know natural systems have tipping points beyond which damaging change (e.g. species loss, climate change, groundwater depletion, land degradation) becomes irreversible, many of those tipping points remain undefined and their potential consequences remain poorly understood.

Postures adopted and actions taken by rich and poor countries as well as emerging markets will continue to shape environmental outcomes in emerging markets. And as in the past, political and economic pressures could overwhelm efforts to consider choices in light of long term implications.

**THE ‘NEW DEAL’ SCENARIO**

The second scenario assumes potentially radical changes in economic systems, structures, incentives, rewards and lifestyles and policies and practises that promote (circular) waste-saving economies, satisficing behaviour and the protection of natural systems to minimize the economic, social and political threats of progressive environmental damage (Figure 11). Growth would be slower but sustainable, and with appropriate policies would service continued social development.

There would be huge challenges.

One would be to balance unambiguous policies with the need to adapt to changing circumstances. Another would be to persuade decision-makers to act with all deliberate speed to halt processes of environmental decay that have been underway for decades.
A third is that decision-makers would find it exceedingly difficult (particularly in Presidential or parliamentary democracies) to persuade publics-at-large to favour the interests of future generations over those of present generations and to convince them that the weight of evidence on GHG emissions, deteriorating air and water quality, the loss of biodiversity and the environmental health implications of rural and urban economies justified drastic and immediate action.

These challenges are not new. Not so long ago, political, business and civil society leaders agreed to deliver water through lead pipes, permitted tobacco smoking in public places and sanctioned the use of asbestos in new construction until confronted with proof they were toxic. Once they learned the truth many countries banned them but until that proof became available, decision makers could reasonably claim they knew no better, see Nilsson et al (2009).

Their successors cannot reasonably claim to be ignorant of the adverse health consequences of environmental damage. Yet there is not a scintilla of doubt that norms, standards and sanctions designed to stabilize, protect and resuscitate natural systems would be vigorously resisted. Scientists and communicators would be confronted with the gargantuan tasks of: (i) persuading leaders action was a mandatory option; and (ii) giving them sufficiently powerful arguments to face down those who wanted to carry on regardless just as, in the past, they faced down opposition from manufacturers, sellers and consumers of lead, tobacco and asbestos (BOX 4). The difference between the past and the future is that the sands of time will be running faster.

The operational question is how governments, businesses, civil societies (including academe and households) can be convinced to accept radical changes in policies and behaviours – while there is still time.

**Box 4:**

The True Believer

“It is the true believer’s ability to shut his eyes and stop his ears to facts that do not deserve to be either seen or heard which is the source of his unequalled fortitude… He cannot be frightened by danger, disheartened by obstacles or baffled by contradictions because he denies their existence”

Hoffer, The True Believer, 1951
If Option ‘A’ in Figure 12 (The ‘Party On’ Scenario) is dismissed as unrealistic (because it would mean business as usual and its consequences), the ‘New Deal’ Scenario could, in theory, be executed in one of two ways.

Option ‘B’ would limit corporate and personal freedoms to damage or neglect the environment through a combination of inducements, sanctions and regulations. Democratic regimes would find this approach unmanageable unless they could persuade voters the cause of environmental protection was the moral equivalent of war and there were no alternatives. Authoritarian regimes would also have difficulties, not least because most such regimes are in countries (including some emerging markets) with large poor populations whose livelihoods depend on access to natural systems.

That leaves Option ‘C’ which would feature a balanced mix of control and cooperation. Before December 2015, few people thought the world could unite to protect the planet from the consequences of climate change. Now it is just possible to imagine cooperation as the new normal. The world would have to adopt collaborative values, partially replace the politics of individualism with the politics of collectivism and shift from an emphasis on ‘me’ to an emphasis on ‘we’ while also accepting significant controls and diminished autonomy. A ‘New Deal’ that traded slower growth for planetary survival, health and well-being may seem implausible. But it will look increasingly better as time goes by.

Action to address outstanding issues of environmental health in emerging markets depends on four things. First, broader and deeper knowledge of environment-driven diseases and preventative and therapeutic interventions. Second, public support for policies to manage the impact of human activity on natural systems. Third, the extent to which efforts to build public support are grounded in evidence and embrace all known forms of persuasion. Fourth, whether emerging markets can respond to challenges of environmental health at earlier stages of socio-economic development than today’s rich countries did in the past.

Box 5:
SDG Target 3.9
By 2030, substantially reduce deaths/illnesses from hazardous chemicals and air, water and soil pollution and contamination.
RECOMMENDATIONS

In shaping its recommendations on environmental health in emerging markets, the symposium took account of and broadly endorsed the conclusions described in the Sustainable Development Goals (see BOX 5), The Rockefeller-Lancet Commission on Planetary Health (see BOX 6) and the OECD (see BOX 7). Many of these conclusions are reflected in the following recommendations (which are amplified in the full report).

GLOBAL LEADERSHIP

● The Climate Change Agreement at the COP21 conference in Paris in December 2015 opened the door to a green health revolution. If implemented and built on, it is likely to be remembered as one of the most important public health treaties in history. The public health community should now join forces with the environment community to take the lead in ensuring it is implemented.

● The Paris Agreement should also inspire additional agreements to address threats to global health and well-being, including threats from air and water pollution, waste mismanagement, soil degradation and diminished biodiversity. In the absence of such agreements, environmental threats to health and well-being in emerging markets are unlikely to be contained.

● To take such cooperative efforts forward, a new global coalition of government, business, civil society and individuals should be created. This could take the form of a new multilateral organization, an intergovernmental panel similar to the Intergovernmental Panel on Climate Change, or a high-level global alliance as called for in the Ministerial Declaration on Health, Environment and Climate Change issued in Marrakech on November 15, 2016. The alliance should be charged with developing a strategic vision of a long-term equilibrium between economic activities and natural systems, and to lay the groundwork for binding global agreements that will ensure better management of immediate environmental threats to people’s health and well-being.

FINANCING AND INNOVATION

● As concluded under the Paris Agreement, rich countries should provide “climate finance” to help emerging markets and other countries adapt to climate change and support the upfront investments needed to switch to renewable energy. Bilateral aid agencies should also mainstream environmental health and climate objectives into official development assistance and public procurement policies.

● In addition, new sources of financing will be needed. The business and investment communities, together with institutions such as the World Bank and regional development banks, should explore innovative ways of jointly investing in country transitions to low-carbon and health-friendly economies as a matter of urgency.

BOX 6:

Rockefeller-Lancet Commission Report

The Commission concluded that:

• The concept of planetary health is based on the understanding that human health and human civilisation depend on flourishing natural systems and the wise stewardship of those natural systems. However, natural systems are being degraded to an extent unprecedented in human history.

• Environmental threats to human health and human civilisation will be characterised by surprise and uncertainty. Our societies face clear and potent dangers that require urgent and transformative actions to protect present and future generations.

• The present systems of governance and organisation of human knowledge are inadequate to address the threats to planetary health. We call for improved governance to aid the integration of social, economic, and environmental policies and for the creation, synthesis, and application of interdisciplinary knowledge to strengthen planetary health.

• Solutions lie within reach and should be based on the redefinition of prosperity to focus on the enhancement of quality of life and delivery of improved health for all, together with respect for the integrity of natural systems. This endeavour will necessitate that societies address the drivers of environmental change by promoting sustainable and equitable patterns of consumption, reducing population growth, and harnessing the power of technology for change.

Box 7:

The OECD View

Having concluded that: environmental issues are complex and inter-related (e.g. climate change can affect hydrological cycles and exacerbate pressures on biodiversity; human health and biodiversity and ecosystem services are intimately linked to water, climate and human health) the OECD report* recommended “a mix of policies… carefully designed to account for these cross-cutting environmental functions and their wider economic and social implications”. It pointed out that: making reform happen will depend on political leadership and widespread public acceptance that changes are both necessary and affordable; that not all the solutions will be cheap (which means cost-effective solutions are critical); and that improved understanding of challenges and trade-offs will be essential. OECD also concluded:

• Integrating environmental objectives in economic and sectoral policies (e.g. energy, agriculture, transport) is vital because, collectively, those policies have greater impacts than environmental policies alone. Environmental challenges should be assessed in the context of other global challenges such as food and energy security and poverty alleviation.

• Well-designed policies can maximise synergies and co-benefits (e.g. by tackling local air pollution to cut GHG emissions while reducing the economic burden of health problems; and climate policy can foster biodiversity if emissions are reduced by avoiding deforestation).

• Contradictory policies must be addressed (e.g. dams that are intended to improve water and energy security can disrupt ecosystems; increased use of biofuels to meet climate goals could have a negative impact on biodiversity by requiring more land for bioenergy crops).

• Because many environmental problems are global (e.g. biodiversity loss, climate change) or linked to the trans-boundary effects of globalization (e.g. trade, international investment), international co-operation is indispensable to ensure effective action and an equitable sharing of the cost of action.

• The economic valuation of environmental impacts (e.g. the full benefits of biodiversity and ecosystem services and health costs associated with exposure to chemicals) must be improved.

In light of these conclusions, OECD recommended that:

• Market-based instruments such as environmental taxes and emissions trading schemes should be used to ensure the costs of pollution exceed those of greener alternatives;

• Prices of natural assets and ecosystem services (e.g. for household and irrigation water should reflect true value (with due allowances for cross-subsidies);

• Environmentally harmful (e.g. fossil)fuels should not be subsidized (here too making allowances for selective subsidies);

• Effective regulations and standards should be used to (inter alia) promote energy efficiency and safeguard human health;

• Encourage green innovation to promote non-polluting production and consumption through public support for basic research and development.

*Environmental Outlook to 2050 OECD, 2012
NATIONAL GOVERNMENTS

- Emerging markets governments should take on leadership roles in addressing environmental health concerns: China and India, which have already committed substantial resources to environmental improvement, could lead the world (particularly if the USA is unwilling or unable to do so). Many emerging market countries are better equipped to anticipate and respond to problems of environmental health. To the extent that they have managed economic, social, cultural and political change for decades, change management has become their stock in trade.

- Governments need to reassess their support for investments in greenhouse gas-intensive activities. For example, in order to reduce environmental impacts from farming, agricultural and forest protection policies and research efforts should be targeted to developing methods that produce high yields with low negative environmental impacts, drawing on techniques from both organic and conventional systems. Relationships between nutrition and environmental health, including the contribution of livestock farming to greenhouse gas and toxic chemical emissions should also be reviewed.

- There is increasing evidence of catalytic and multiple benefits of investing in environmental improvements. For example, it is estimated that doubling the share of renewable energy by 2030 would not only reduce air pollution-related disease but would also create 24 million jobs and bring a global GDP increase of 1.1%. Improving water and sanitation services benefits public health, increases labour productivity and brings an estimated return of between US$ 5-28 per dollar invested. These linkages provide a strong basis for improving policy coherence on a national scale and for governments to adopt integrated policies to improve the quality of the environment, with all sectors taking their share of responsibility.

- Governments also need to reconsider their levels of investment in environmental health and prevention strategies. Even in wealthy OECD countries, only 3% of health budgets is spent on prevention. There is an urgent need to adopt a wider view of risk factors for death and disease in health systems that includes both the social and environmental determinants of health. In the immediate future, the upcoming 2018 summit on non-communicable diseases (NCDs) should provide a platform for considering a new agenda for a broad ‘one health’ system, as part of efforts to achieve the WHO-proposed goal of reducing NCDs by 25% by 2025.

- Legislation and systems of incentives and disincentives should also play a greater role. Far too often, tax and subsidy systems work against health improvements, for example favouring the production of animal fat rather than fruit and vegetables. The history of tobacco control has clearly demonstrated the need to invest in legislation as well as public education programmes in order to change behaviour.

LOCAL AUTHORITIES

- Local leaders are vital for local change as they are closer to communities and understand their problems better. For example, mayors were among the loudest voices lobbying in favour of the Paris Agreement. Many cities and associations of mayors are now playing very significant roles in the implementation of innovative solutions to improve their environments and the well-being of citizens. These actions should become a source of inspiration for other district and local authorities.
BUSINESS

- In recent years, in economic circles, there has been a broad consensus that environmental initiatives harm economic growth and business. This view is now changing. New attitudes, priorities and practices in the private sector are essential to improved environmental health. Corporate capabilities in areas such as finance, technology, and advertising must be mobilised to fix existing problems and to help change behaviours.

- Openness to innovation can give businesses competitive edges. For example, new research in Europe shows that companies that focus on eco-innovation are growing at an annual rate of 15% at a time when many competitors remain flat. In some emerging market contexts, these advantages may be offset by relative weaknesses in corporate governance and regulatory regimes which means the latter will require greater attention if businesses are to achieve their full potential and social impact.

CIVIL SOCIETY

- Civil society organizations group powerful forces for changing the environmental attitudes and actions of citizens, companies and governments through lobbying, publishing, broadcasting, protesting and the use of social media. International NGOs should explore further ways of collaborating with domestic NGOs and with universities and research institutions in emerging markets with a view to exchanging knowledge and developing scientifically-grounded arguments that can be persuasive in local contexts, i.e. exchanging in the double sense of linguistic adaptation and transformation into policies.

MEDIA

- Mainstream and social media companies should consider taking on more pro-active roles as gatekeepers in the face of campaigns led by particular vested interests that aim to undermine facts or disseminate ‘alternative facts’. While the principle of ‘fairness’ and of giving equal weight, time or space in media outlets to different perspectives may make sense in political debates, it makes no sense when it comes to promoting mis- or dis-information rather than independent scientific knowledge. For example, it is now well documented that the media continued to present the scientific debate over tobacco as unsettled long after scientists had concluded otherwise.550
ENDNOTES

S1. Organized by the Emerging Markets Symposium (EMS) at Green Templeton College

S2. Planetary Health is defined as the health of human civilizations and the state of natural systems on which health depends

S3. By Antoine van Agtmael, then working at the International Finance Corporation (IFC)

S4. Examples: Cuba, Tanzania, China, Taiwan, Singapore

S5. Richard Hardman, past-President of the Geological Society of London commented: "In my lifetime, humanity has become a geological force but the Anthropocene could be a very thin layer of geological time".

S6. DALY: Disability Adjusted Life-Year


S9. On average

S10. April 22, 1970 was the first Earth Day

S11. A clock denoting time remaining until the end of game in some sports played in the USA and other countries

S12. National Academy of Sciences

S13. Periodic adjustments to the Doomsday Clock have been published in The Bulletin of the Atomic Scientists since 1947. The latest update was published in January 2017

S14. Most notably, the 2015 Paris Agreement and some national and city government initiatives.

S15. There is scientific uncertainty about the relationships between some environmental change and human health outcomes (e.g. the causes of some cancers) but the scientific evidence is generally overwhelming

S16. e.g. Household waste recycling, largely unheard of in most emerging markets in 1970, had become part of daily life, mainly in higher income groups, in many emerging markets by 2000.

S17. Driven by such events as the Great Smog in London (1952)

S18. Venues of precursor meetings to the Paris Agreement of December 2015

S19. Some countries trying to manage them while others played development catch-up

S20. 'Wicked problems' are complex issues that defy definition and resist final solutions

S21. Named for the owner of a livery stable in Cambridge (England) whose customers could not choose their horses

S22. 'Think global, act local' was a slogan coined for Friends of the Earth by David Brower, its founder


S26. Raworth op cit


S28. See Haines (2013)

S30. A Man and his Wife had the good fortune to possess a Goose which laid a Golden Egg every day. Lucky though they were, they soon began to think they were not getting rich fast enough, and, imagining the bird must be made of gold, they decided to kill it to secure its precious metal at once. When they cut it open they found it was just like any other goose. They neither got rich all at once nor enjoyed daily additions to their wealth. Much wants more and loses all. ‘The Goose that Laid the Golden Egg,’ Aesop, 620-564 BC.

S31. i.e. species that are unique to one area.

S32. As the rest of the world is well aware, emerging markets are custodians of unique ecosystems.

S33. Voltaire (1759)

S34. Sartre (1944)

S35. Except in Africa

S36. Measured in Purchasing Power Parity (PPP) which yields higher numbers than calculations based on market exchange rates.

S37. 20% of the total in terms of Market Exchange Rates (MERS) (as well as PPP)

S38. The projections are based on a model in which GDP is driven by four main supply-side factors using a Cobb-Douglas production function. Source: PWC (2017)


S40. The Economics of Ecosystems and Biodiversity (TEEB) is an international study led by Pavan Sukhdev that suggests the aggregate loss of global biodiversity associated with forest loss worldwide, is between US$ 2 and 5 trillion per year.

S41. To which older people are particularly susceptible.


S43. As defined by WHO (2016)

S44. Margaret Chan, Director-General of WHO (2006-2017)

S45. Changes in lifestyles

S46. Regenerative economic systems that rebuild natural capital and other forms of capital by eliminating waste

S47. Maximizing objectives are replaced by satisficing objectives

S48. An historical example was the Dominican Republic government’s decision to control wood collection for domestic cooking by putting forests under the direct control of the army in the late 1960s

S49. UNEP (2016)

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Sartre, Jean-Paul Huis Clos, Paris, May 1944


Voltaire (1759) Candide Paris 1759


FIGURE SOURCES

Figure 1: “Source: EMS 2017 Analytical Framework” (Reference: Carlqvist, A. (2016). Health and the Environment in Emerging Markets: An Analytical Framework, Green Templeton College. Figure 1.1.1 Map of countries. Sample High Income Countries (HIC) are Australia, Japan, Switzerland, United Kingdom, United States. Sample Low Income Countries (LIC) are Bangladesh, Cambodia, Ethiopia, Haiti, Nigeria.


Figure 5: “Source: “Copyright Okefenokee Glee & Perloo, Inc. Used by permission. Contact permissions@pogocomics.com.” (Reference: PogoComics.com is the official home of Okefenokee Glee & Perloo, Inc. (OGPI), owners and sole controlling entity of the copyrighted and trademarked works of Walt Kelly, including the text and comic characters that make up the Pogo comic strips, and all other published text and artwork by Walt Kelly.)

Figure 6: “Source: Raworth (2017)” (Reference: Raworth, Kate (2017) Doughnut Economics, Cornerstone, 2017.)

Figure 7: “Source: allianz.com”. (Reference: The megacity of the future is smart available at https://www.allianz.com/en/press/news/studies/151130_the-megacity-of-the-future-is-smart/)

Figure 8: “Source: EMS Original 2017”

Figure 9: “Source: EMS Original 2017”


Figure 11: “Source: EMS Original 2017”

Figure 12: “Source: EMS Original 2017”
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