



RESEARCH & INNOVATION

FUTURE OF SPACESHIP EARTH

Will the Sustainable Development Goals be reached?

Executive summary

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EXECUTIVE SUMMARY



In *The Future of Spaceship Earth* project, DNV GL presents a “most likely future” forecast of what will happen on our planet through to the middle of this century. 2050 is quite some way off into the future, and very few, if any, organisations and governments have set specific targets that extend for more than three decades into the future. However, in September 2015, the UN adopted its 17 Sustainable Development Goals (SDGs) for the year 2030. We found that we could use our consistent, long term forecast to assess the likelihood of global society achieving each of the 17 SDGs (in the absence of extraordinary action¹). We have now completed this assessment and used it as basis for making recommendations about which extraordinary efforts should be implemented over the next 15 years in order to create a better future, one that fulfils all SDGs.

Some might question the value of forecasting what will happen through to 2050. They might argue that a 35-year time horizon is too long for a business organization like DNV GL. Our response is that our customers typically invest in assets – vessels, wind farms, pipelines, distribution grids etc. – with an operating life between 20 to 50 years. As a world-leading provider of rules, standards and technical assurance services, we see it as our duty to have a consistent and well-considered view of what will happen if there is no extraordinary action. Such a long-term outlook will serve as a useful guide when our customers and our own organisation prepare for the future. Will a given proposed solution work? Will there be demand?

By having a well thought-through view on the most likely future and by building up increased and multifaceted competence on what are likely to be

1). Extraordinary beyond the ordinary actions, where ordinary actions are everything we have taken into account in our forecast



the most critical areas, like climate, energy, water, ocean, food, and health – our mission is to turn DNV GL's vision *Global Impact for a Safe and Sustainable Future* into action.

WHAT WILL THE WORLD LOOK LIKE IN 2050?

If this question is viewed from the perspective of human well-being, then we can confidently say that there will be progress. The world will be a better place in sum, but plagued by huge differences among regions and within nations. The averages will look better, but the number of underprivileged people will also be significant, at least as numerous as today. There will be much broader access to education, energy, food, clean water and sanitation. But there will still be distinct differences between the developed world – which in 2050 will include China – and the still-developing world. Some emerging economies will have followed in the tracks of Japan, Korea

and China and achieved fast and sustained economic development. Many of the poor nations will remain mired in relative poverty. The currently rich world will stay ahead, but experience slow growth in the output per person and increasing inequity.

Population

Our most likely forecast says that the world population will increase to 8.5 billion – a figure lower than the predictions of most other forecasters. Our view is based on our prediction that fertility rates in the developing world will continue their decline, with more and better female education, health, contraception and increased urbanisation as the major drivers.

Global Gross Domestic Product (GDP)

The total value of the world's annual output of goods and services, the GDP, will be around twice as big in 2050 as it is now. This is in spite of the fact that GDP

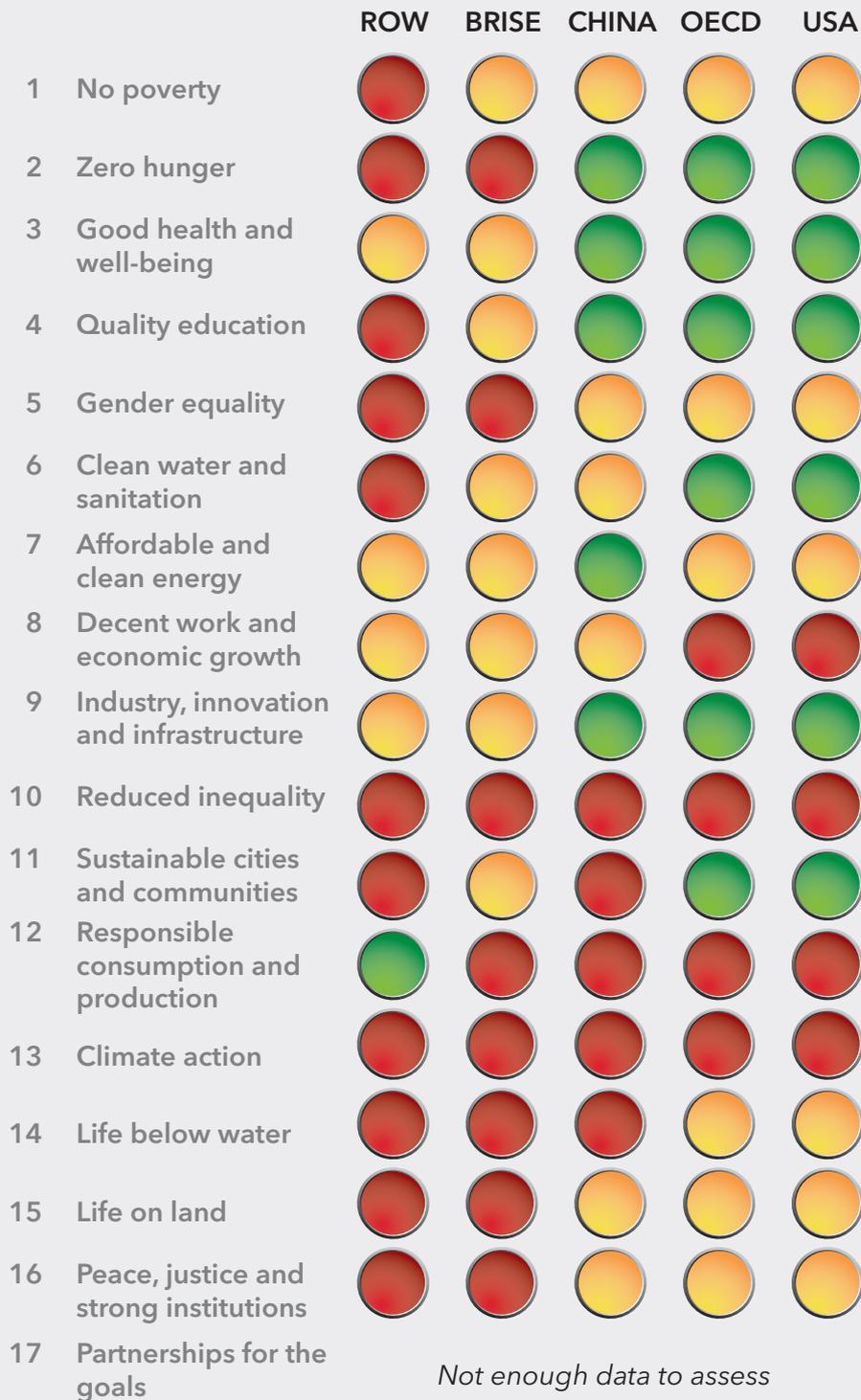


Figure 1.1 Likelihood of meeting the 17 Sustainable Development Goals in the five regions of the world. (Details set out in Table 3.1):

1. ROW - and the rest of the world
2. BRISE (standing for Brazil, India, South Africa and Emerging) - i.e. the 14 biggest emerging economies
3. China
4. OECD - the rest of the rich world
5. The USA

- Goal is likely to be achieved
- Goal not likely to be achieved, but that more than half of the initial gap will be closed
- Goal unlikely to be achieved.

growth will slow down and almost stop in the developed world - as these economies continue to evolve from being manufacturing-based to being increasingly dominated by services, culture and care provision.

Energy use

Global energy use will increase significantly over the next 15 years, but thereafter almost plateau as reduction in energy intensity will outweigh the growth in GDP. Renewable energy will provide half the energy used by the world in 2050, but the world will still be burning a lot of coal, oil and gas. As a result, accumulated CO₂ emissions will by then have overshoot the acceptable carbon budget - the limit that would ensure that global warming stays below 2 °C above preindustrial levels. That will certainly produce noticeable effects by 2050, with global average temperatures up by 1.8 °C above preindustrial levels. But it is in the decades that follow when problems start to compound and deepen. Inertia in the global energy system will drive the global average temperature to around 2.5 °C above the preindustrial temperature before stabilizing and the world enters dangerous territory with possible unknown consequences.

Ecological footprint

2050 viewed from an environmental perspective is, sadly, a picture of deterioration. The rate of environmental degradation will slow, but resources will continue to be used beyond the carrying capacity of the planet. And emissions will stay high enough to increase the global average surface temperature. Needless to say, our picture of the future both can and will be improved over the years ahead. One reason to present our current forecast, as openly and honestly as we can, is to invite everyone who cares to help us improve our forecast - in order for us all to better know what is most likely to happen if there is no extraordinary action. To the extent that it highlights the need for extraordinary action, it pleases us to see that the outcome of the COP-21 in Paris in December 2015 is consistent with our forecast.

ASSESSING THE LIKELIHOOD OF MEETING THE SUSTAINABLE DEVELOPMENT GOALS

The Sustainable Development Goals (SDGs) describe what humanity wants the future to bring. Collectively, they constitute the world's common view of what a

safe and sustainable future will look like, defined by 17 goals and 169 targets. Comparing our forecast with the SDGs gives an indication of how big the gap will be between desire and reality in 2030.

Many organizations already track global performance on the SDGs, and some are doing the same as us: assessing the likelihood that humanity will reach the SDGs. But no other organization is basing its assessment on a quantitative, consistent and dynamic forecasting model, which provides the quantitative backbone for the future development of five world regions. On the other hand, many do what we also do, which is to enrich the quantitative analysis with qualitative assessments based on multidisciplinary experience with the real world.

We have used our quantitative model in a transparent way to arrive to our assessment - the framework and inputs are available for any interested party to see. Not all of the assessments follow directly from the quantitative model. In the following we make it clear where the quantitative model does not significantly inform the assessment.

As can be seen from Figure 1.1, none of the 17 SDGs will be achieved in all regions of the world according to our assessment. Human development goals like food, health and water/sanitation generally achieve high score (i.e. are likely to be achieved), while the ambitions of stable climate, equality and sustainable consumption achieve low score.

Our assessment demonstrates large regional differences in goal achievement. For the rich world (OECD including USA) most goals will be reached, but nevertheless there will be large challenges with over-consumption and climate change. China will increasingly resemble OECD, reaching more than half of the per capita income of the rich world in 2030, and achieving many of the SDGs. The bigger emerging economies like Brazil, India, South Africa ('BRISE'), and to a greater extent the Rest of the World ('ROW'), will fail to achieve most goals, but will nevertheless make significant progress in many areas.

WHAT SHOULD BE DONE?

Importantly, our analysis shows that many more SDGs

can be reached if humanity chooses to put in the necessary extraordinary action. The 17 goals are closely interlinked, and achieving one goal will often require – and contribute towards – success within other goals.

Looking at the results, the two most serious challenges are inequality and climate change, represented by SDG 10 and SDG 13, both with red scores for all five regions.

Our analysis shows that increasing the renewables share of the energy mix is the most important factor for reducing CO₂ emissions, and the only realistic measure that can limit global warming to below 2 °C above preindustrial levels. Luckily there is already significant development in the area of renewables, but extraordinary effort is needed if the relevant SDGs are to be reached.

Redistribution, being simply to “take from the rich and give to the poor”, is the obvious solution on the inequality challenge. As simple as it is in theory, the redistribution proves extremely difficult in action.

Our recommendation is further that global society should pay extraordinary attention to the following general issues in order to increase the likelihood of achieving all the SDGs:

- **Action:** Ensure early actions, as it is urgent to start the progress now to achieve the Sustainable Development Goals
- **Governance:** Strong governance embracing effective taxation, positive incentives and smart regulations will be crucial in making quick progress towards the SDGs
- **Business:** Business leadership to support the primary role of business sector as an “effective problem solver” in the society. Transforming tomorrow’s leadership into “Corporate Statesmanship” with companies actively contributing to solve societal challenges
- **Emissions:** Enable early emission reductions and climate resilience, ensure financing and enable smart regulations to stimulate technology uptake and scale
- **Solutions:** Learn from pilots, share best practice and scale up new sustainable solutions on regional, country and city level

As mentioned, we conclude that none of the SDGs will be achieved in all regions, unless extraordinary efforts are made. Based on this, it is fair to say that all SDGs need attention. Specific recommendations for extraordinary action are therefore needed for all SDGs. To coin a phrase from another famous starship, humankind needs, “To boldly go where no man has been before.” In this report we are making a first, humble, attempt in this direction by offering a set of detailed recommendations for extraordinary effort in the areas where DNV GL has its strongest competence – Energy consumption and production, Climate Change and the Ocean space.

In the years ahead we will seek to sharpen our forecast, our conclusions and recommendations, together with our partners and customers.

As a 151-year-old organization our purpose of Safeguarding Life, Property and the Environment remains. Inspired by our vision, *Global Impact for a Safe and Sustainable Future*, we will continue to guide our customers and prepare our organization for the future.

The Future of Spaceship Earth project builds a knowledge platform that gives us foresight to guide priorities and resources and thereby increase the wellbeing of Earthlings.

We welcome all your comments, reflections and any help in this effort!

www.dnvgl.com/spaceshipearth



Afroreggae raised a flag to represent Goal 10, Reduced Inequalities, in Morro de Alem o in Rio de Janeiro, Brazil, to support the UN Global Goals for Sustainable Development. Credit: Cristina Granato

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DNV GL

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