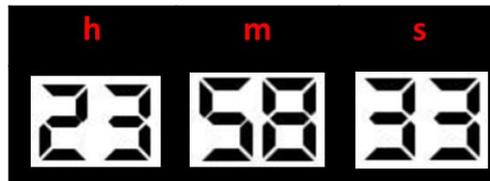




## Seconds to Midnight

12 July 2021

By the end of the year the time will be.....



or

**just under 90 seconds to midnight!**

Between the best and the worst-case future there is a huge difference and our response during the next decade will determine where we land in the space in-between. Our ecosystems are unravelling, the global temperature is continuing to increase, weather induced events leading to financial as well as human life losses are on the increase, water and air is poisonous and our current lack in commitment to embark on a just transition pathway is suggesting a grim outcome.

As aptly said by Ryan Hagen in his article: The world that is...and what it could be (part 2);  
***“civilisation doesn’t have to hit a brick wall.”***

### Topics:

In this article I aim to cover the following topics:

- The modern **timeline**
- The **science** and how we compare with the Science-based Target (SBT) principle
- **Water**
- **Population** growth
- **Risks** and **challenges**
- Where to find the **solution**

*“Science tells us the earth is over 4.7 billion years old, with all of modern history and human civilization only occurring within the last 5,000 to 10,000 years. Said differently, if all of time were compared to a 12-month calendar, all of mankind’s recorded history would have occurred on the last second, of the last minute, of the last day of that year. Using our universal time-line as an analogy, everything we know as humans has transpired at 11:59PM on December 31st...all in less than one second. All of the world’s cultures, languages, countries, empires, governments, religions, stories, songs and dreams that have ever come and gone — and those that are still here have all happened within this “one second before midnight”.” (By Al Petrone, published in the Huffington Post on 17 April 2009 when Barrack Obama won his first presidential election)*

# Shifting to a more modern timeline

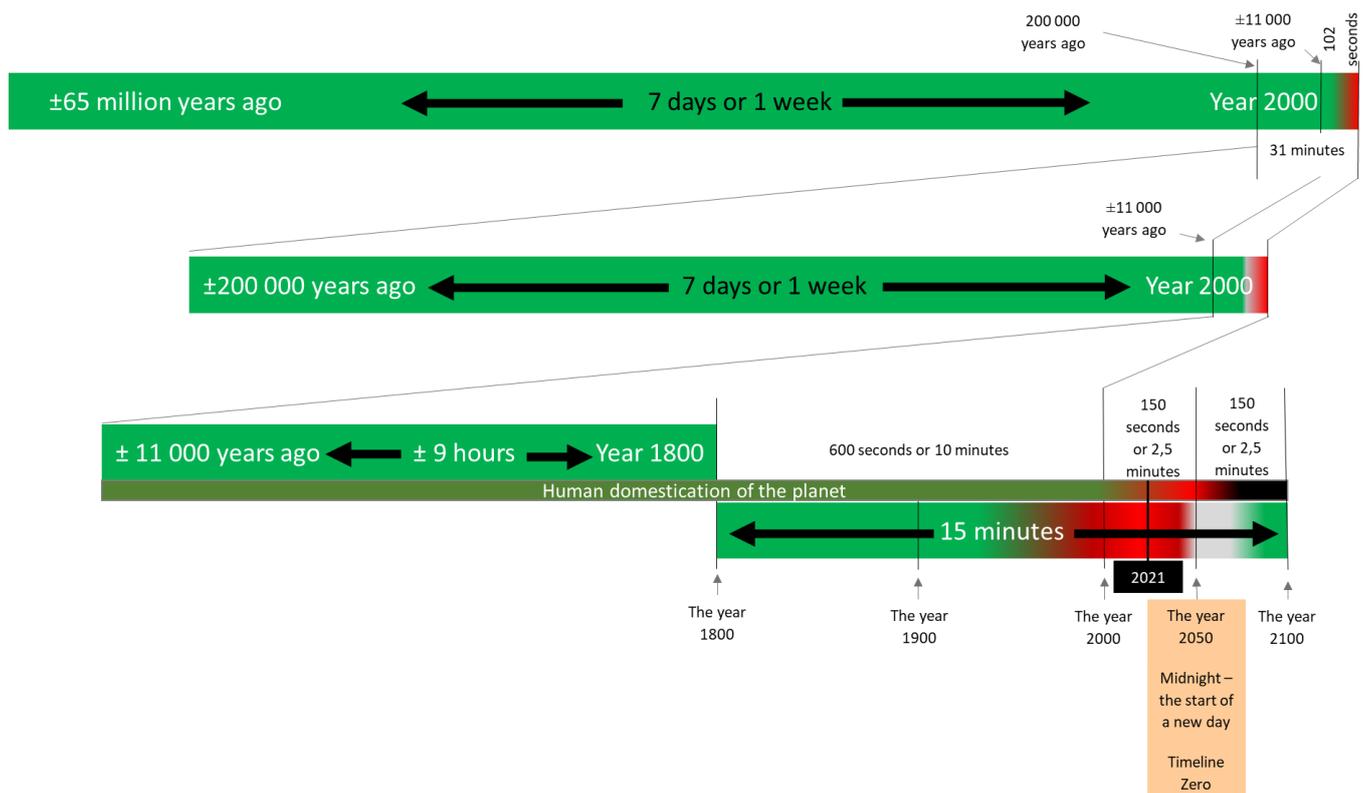
I have adopted the timeline approach as quoted by Al Petrone above to a more recent timeline and thought it would be insightful to use the idea of a “climate change clock” to demonstrate our impact as humanity in context with modern times.

If we shift the timeline to the last 65 million years, we will experience the upper green bar in *figure 1* below.

65 million years ago mammals started to roam the planet and about 200 000 years ago human like creatures started to develop leading to about 11 000 years ago when mankind started to domesticate plants and animals. About 200 years ago, at the beginning of the 1800’s, the industrial revolution started. If we choose to timeline this period to one week, the last 11 000 years of human domestication of the planet represents only 102 seconds of the 7 days, whilst the last 200 000 years represents 31 minutes.

The middle bar in *figure 1* below demonstrates the 200 000-year period since human-like existence, also over 7 days, representing the last 31 minutes of the upper green bar or timeline. In the bottom set of graphs in *figure 1* below it can be seen that the industrial era was only 10 minutes of the seven days to the year 2000, spanning the period 1800 to 2000. This means by the year 2000 we were sitting at 2½-minutes to midnight if we say the clock stops at 12:00 (midnight for the current day, or timeline “zero”). We are in the year 2021 and hence we are almost halfway through this 2½-minute period and by the end of this year, we are left with less than 90-seconds to midnight.

*Figure 1: A more modern set of timelines*



The red inside the bars represents the negative impact of global warming due to the industrialisation occurring after the 1800's. In the bottom set of bars is a timeline bar representing the human domestication of the planet. If we are unsuccessful in managing the climate change risks, it will leave nothing further to domesticate or to (properly) survive beyond the second half of this century (represented by the black section in the bar).

If we are successful, the bottom bar in the third set of bars in *figure 1* above might be a realistic outcome where future generations will manage during the second half of this century to return the planet into in some level of normal balance.

The 6<sup>th</sup> mass extinction has begun, and scientists believe that even if no further babies are born, the human impact cannot be stopped on this extinction.

At 90 seconds to midnight, time is of the essence.

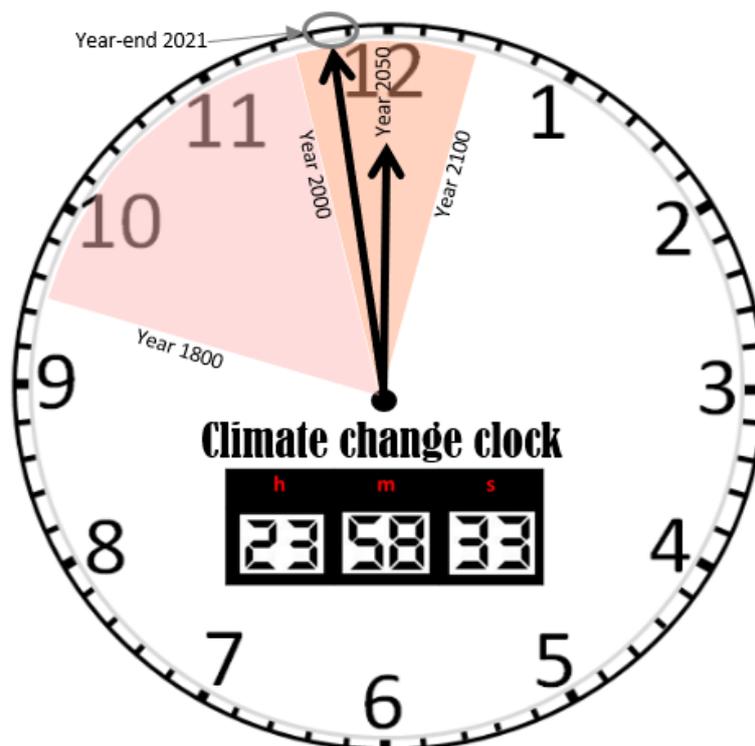
## Timeline “Zero” and the Climate Change Clock

**Timeline “Zero” is aligned with the Paris Agreement (COP 21) to become carbon neutral and supporting the goal of keeping mean global temperature increase below 1,5°C.**

**Timeline “Zero” is representing the moment of truth when future generations will measure, look back at what we knew, and confirm the current generations’ success, or lack of it.**

**Timeline “Zero” is at midnight on the last day of 2050** whereafter a new day begins on a (hopefully) prosperous, just and equal existence of humanity in harmony with nature on this earth.

*Figure 2: The climate change clock*



# The science

The average temperature on the globe is rising since the 1900's and is commonly attributed to the Anthropocene epoch, caused by industrialisation. If this increase in temperature continues it will destroy large portions of habitable, agricultural and forest area leading to poor health, food and water scarcity, sea levels rising, loss of biodiversity, ultimately leading to economic, political and social instability.

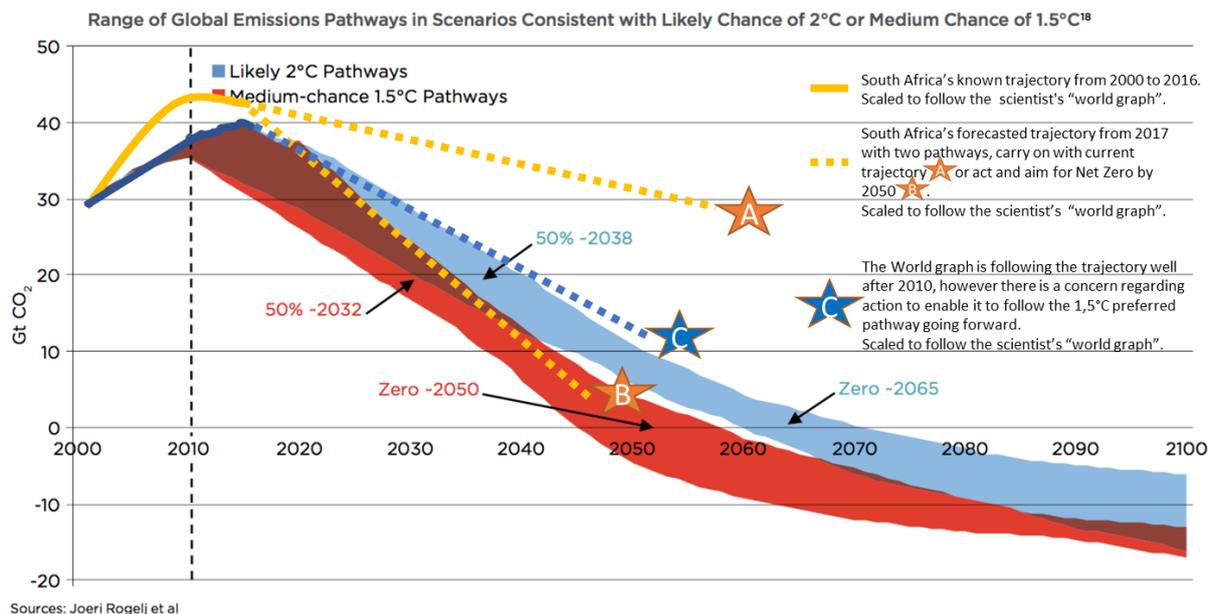
Despite efforts, the limits of anthropogenic Greenhouse Gases (GHG) emissions continue to increase and under the current trajectories it is projected that mean average global temperature will increase between 3,7°C and 4,8°C by the end of the century (2100). In the Paris Agreement, generally referred to as COP 21, many national governments committed to limit temperature rise to well below 2°C and pursue efforts to limit temperature rise to 1,5°C.

Through science a carbon budget was calculated using 2010 as base year and is generally accepted as between 2 250 Giga Tonnes (GT) – 2 900 GT to prevent an increase exceeding 1,5°C – 2°C in mean global temperature. It is calculated that 1 890 GT of this budget has been used by 2010 and that human activity currently emits around 50 GT of GHG emissions per annum.

At the current rate and following the 2°C increase as guide, the carbon budget available in 2010 was 1 010 GT. At the current emission rate of 50 GT/annum ([Greenhouse gas emissions - Our World in Data](#)) we have a window of less than 10 years before the 2010 budget is depleted, implying depletion before 2030. **(Using the timeline in figures 1 & 2 above, it is less than 30 seconds from now.)**

If we use 35 GT/annum as an average (roughly where *graph 1* below indicate we were emitting per annum in 2010) and maintain that, it means we have less than 20 years, implying less than 60 seconds from now (based on the climate clock in *figure 2* above).

**Graph 1: Emission reduction pathways for 1,5°C and 2°C respectively and scaled versions of current data available for the World and South Africa respectively plotted on the suggested reduction pathways to see how these currently match with what is proposed through science**



The Science-based Target Initiative (SBTi) originated in collaboration between CDP (previously known as Carbon Disclosure Project), World Resources Institute (WRI), World Wide Fund for Nature (WWF) and United Nations Global Compact (UNGC). The initiative's overall aim was that by 2020, Science-based target (SBT) setting will be a standard business practice, embedding SBT's as a fundamental component of sustainability management practices. **Sadly, we missed this goal!**

## Dare to compare

I want to challenge you as reader to use *graph 1* above, rescale it and plot your company's annual scope 1, 2 & 3 GHG emissions on the graph, start with your 2010 emissions and see if you are on the appropriate decline pathway with your absolute GHG emissions and reflect on your contribution to your own success and future if you are not aligning with the science.

## The Scope 3 emission scare

In my experience I have found that scope 3 emissions are not respected appropriately, resulting in very little attention to it. We need to look at emissions in our whole value chain and for that reason I suggest that a proper preliminary screening is executed on your scope 3 emissions as I have found that it could be under-disclosed by as much as 16-times. The fact of the matter is, you have the responsibility to influence your whole value chain to ensure appropriate impact to affect a changed future outcome.

## Water and climate change

A 2°C increase in global temperature will result in a 4°C increase in South Africa, implying that droughts will in future be more severe and weather-related risks more impactful.

Through my own observations and assumptions, I concluded that roughly 8% of South Africa's surface is catching and feeding 50% of the country's surface water. Due to climate change, I expect that the 50% surface water volumes could reduce by 24 - 33%, implying we will have only 67 – 76% of the current volumes of surface water available if the balance of surface water can maintain its current volume availability.

South Africa imports water from the Lesotho highlands to Gauteng and through the highlands scheme the shortfall in the Vaal system is supplemented to serve the needs of amongst others, Gauteng. In 2015 the Lesotho Highlands Phase 2 agreements should have been signed, this was delayed and implying that Gauteng might be in a water deficit soon.

In May 2011 the CSIR warned the country with the following statement: *"The country's freshwater resources will be fully depleted by 2030 and unable to meet the needs of people, industry and our neighbours if we continue to exploit our water resources by following a 'business as usual' approach."*

## Population growth

We were at the beginning of the industrial revolution about 0,9 billion people on the planet and by the year 2000 we were around 6,1 billion people. In 2015, the United Nations predicted that the global population could surpass 11 billion by the end of the century. Last year, the UN revised these

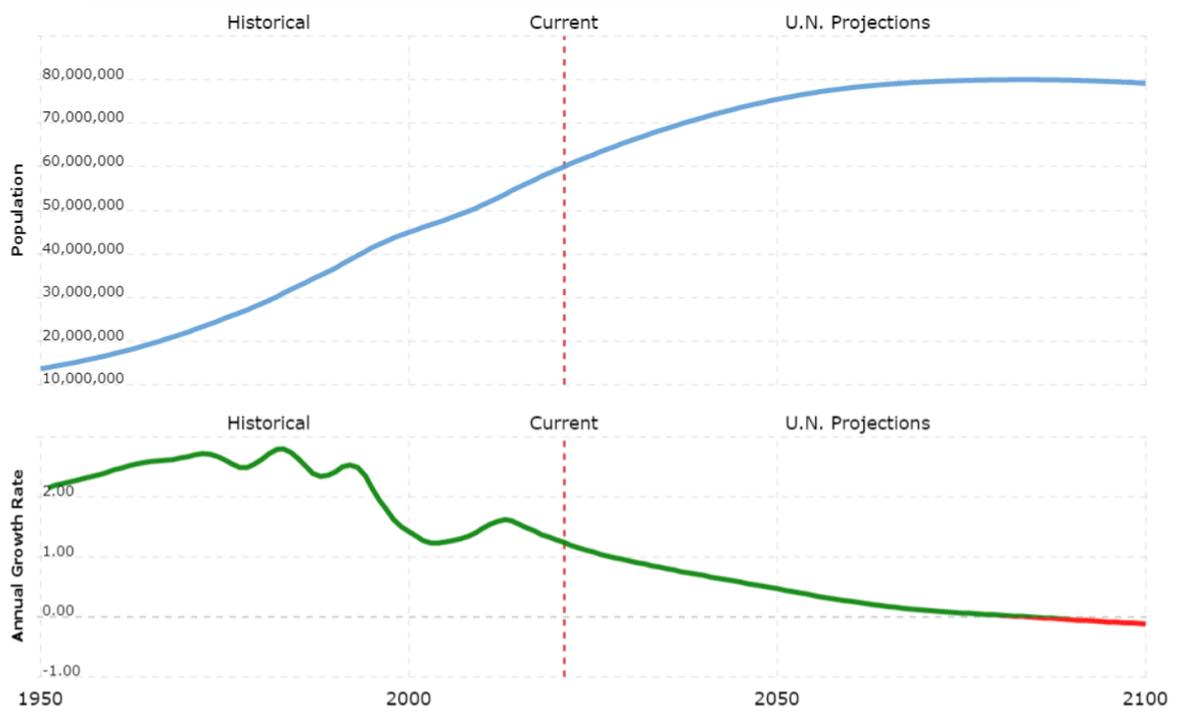
estimates, but the numbers it came up with were still well above 10 billion. These regular projections from the UN have been the status quo—until now.

Plenty of signs have pointed to there being a population plateau, but recent research from the Institute for Health Metrics and Evaluation (IHME), published in [The Lancet](#), suggests that the number of people on this planet may actually start to *shrink* well before the year 2100. ([Visualizing the World Population in 2100, by Country \(visualcapitalist.com\)](#))

According to *graph 2* below the South African population can still grow with 33% from the current around 60 million people, peaking at around 80 million in 2070-80 and then start to decline.

**Graph 2: South Africa's Population Growth Rate 1950-2021:**

<https://www.macrotrends.net/countries/ZAF/south-africa/population-growth-rate>



## Risks

The combined effect of climate change and its inherent risks, a lack in action to justly transition, water scarcity and the population growth are some of the factors that will contribute to the potential unsustainability of our businesses and society-wide failure of value systems, prosperity, equality, education, food supply, job creation, etc.; all of this potentially leading to country or governmental instability or failure. The collective of the aforementioned will be devastating.

## Pain points and solutions

**Pain points:** I list some of the issues below; and some of the pain points that one might be faced with could be all or some of the following:

- A current state assessment, including a scenario analysis that will unpack the risks and opportunities, include a gap analysis, and collectively evolve into a long-term strategy.

- Benchmarking and goal setting
- Project identification and development
- Understanding the 4<sup>th</sup> industrial revolution and its impact on your business, the role innovation will play, the impact of artificial intelligence, internet of things, big data and data analytics and the prevention of stranded assets.
- Project implementation
- Project and program management
- “Green” financing, feasibility studies and lifecycle analysis
- CAPEX constraints
- Measurement and verification, internal and external reporting, tracking, policies and forward-looking to futureproof the business from climate as well as associated regulatory changes.
- ESG, annual integrated and other relevant internal and external reporting.

**Solution:** The subject matter that needs to be covered is vast and the reality is that very few organisations could afford the luxury to have all the required skills, knowledge and knowhow inhouse.

I struggled with these concepts for long because I could not find the common thread that link all into one.....and then ESG came along and connected all the dots.

Therefore, anyone is welcome to phone or email me, I can help you to get to your unique solution that will make financial sense and futureproof your business. Therefore, anyone is welcome to phone or email me, I can help you to get to your unique solution that will make financial sense and futureproof your business. Collectively, through the business model, we can offer more than 150 years of experience in sustainability. Assistance and guidance are available on all the items listed under the pain points above, right down to asset finance, shared savings models, utilities as a service and “green” financing.

Making contact will cost you nothing, however, might have enough substance to set you on your way.

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