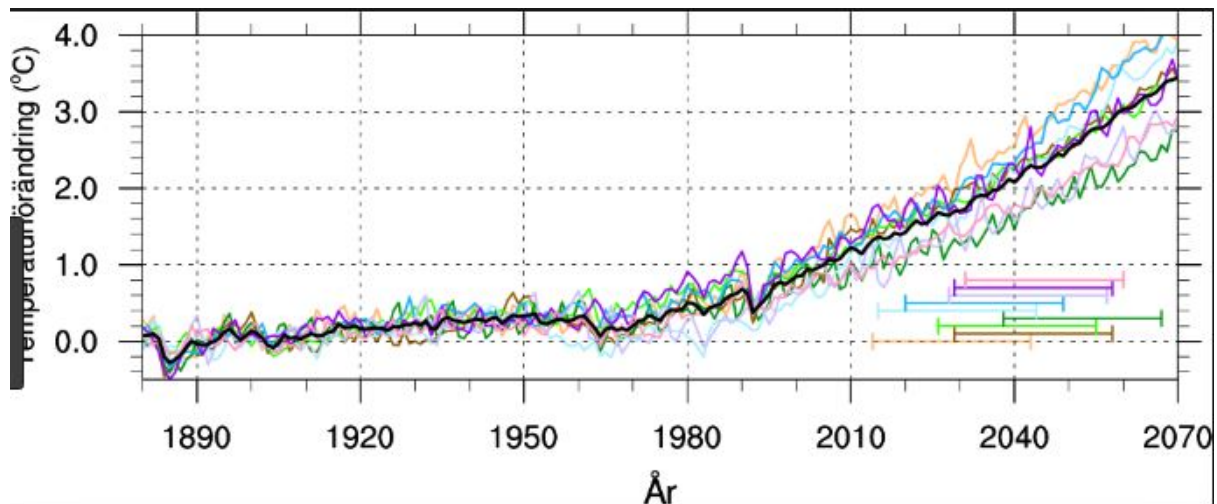


**Written evidence submitted by
Andrew H Mackay, Renewable Thermal Systems Limited (CGE0077)**

Please be advised that the steps I have outlined in this submission is the only way of reducing CO2 emissions to zero by 2025. The desalination ships are necessary to irrigate the deserts around the world for food production for a burgeoning population. The growing population will benefit from electricity 24-7 52 that will be at least 50 times cheaper than it is today. All other countries will adopt this method because they cannot compete with electricity costing 50 times more.

<https://www.smhi.se/en/climate>



The SMHI shows the temperature rise above pre-industrial levels of 0.5C, 1.2C and 1.3C in years 1990, 2010 and 2015 respectively. My graph shows an exponential rise of 6% year on year starting in year 1990 at 0.3C and rising exponentially through 2010 at 0.96C and through 2015 at 1.29C.

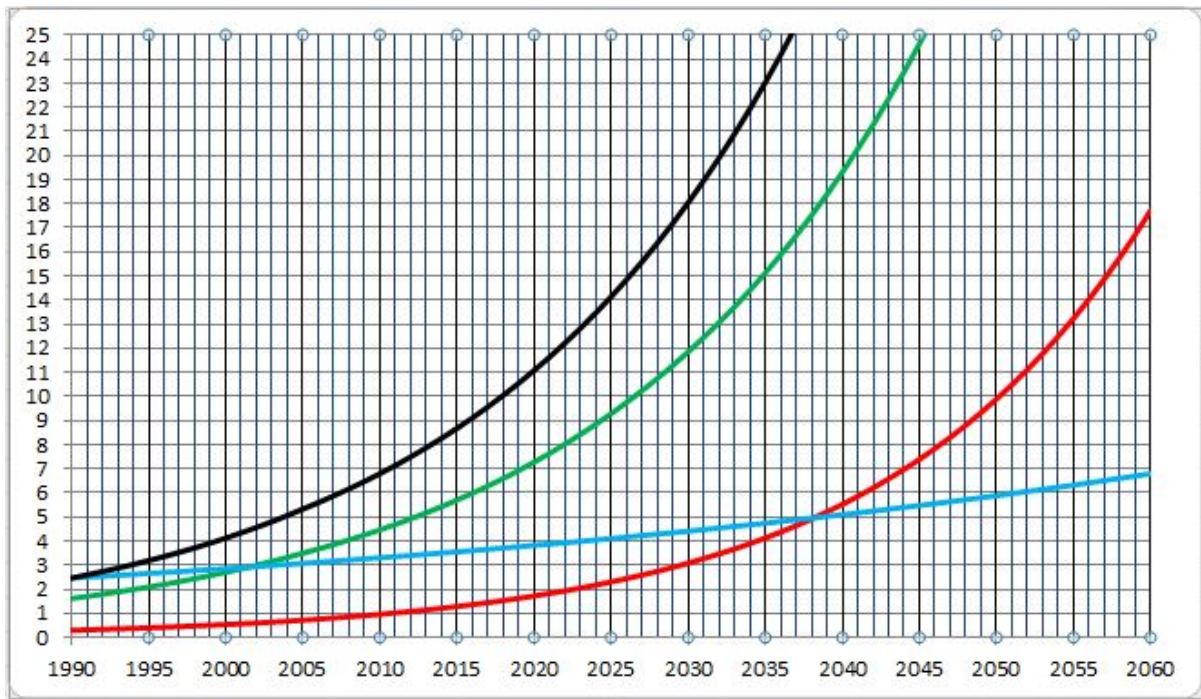
This means that we have already crashed through 1.5C 'target' at the end of 2018. This is despite 104.3 Peta-Watt-hours (PWh) of renewable electricity generated since 1990 to the end of 2018. Global renewable generation is rising exponentially at a rate of 5% year on year so that, by the end of 2030, the total renewable generation since 1990 will be in excess of 214.6 PWh. Unfortunately, the temperature rise will be at 3.1C by the end of 2030 using the exponential function.

The graph shown above is based on a combination of pure conjecture and wishful thinking and is also mathematical nonsense. By 2035 my red exponential line will have already gone through the 4C ceiling.

The Minister should act now by following the steps I have outlined before – if she just carries on as before trusting highly paid 'advisors' whose incompetence and stupidity has brought us to the brink of extinction, then there is no hope for us from this government. I suggest that Extinction Rebellion should put up candidates in all constituencies for the forthcoming EU and general elections and change the law to achieve its targets by adopting Gentec WaTS.

The Exponential Function.

Most people know what compound interest is. This is another name for the Exponential Function. If you took out a loan of £300 with a 6% compound interest at the beginning on 1990 with the understanding that you were to pay it off at the end of 2030. What would you pay? The answer is £3,100. If you substitute £300 with 0.3C; by the end of 2030 this figure will be 3.1C as shown above.



Red Line; Rise in Average Global Temperature in degrees Celsius @ 6% year on year.
Green Line; Renewable Electricity Generation in Peta-Watt-hours@5% year on year.
Blue Line; CO2 in tens of Giga-tonnes from burning fossil fuels only @1.45% year on year.
Black Line; CO2 in tens of Giga-tonnes from burning fossil and biomass @ 11.3% year on year.

The Paris Agreement aims to limit global warming relative to a pre-industrial baseline. Its precise commitment is:

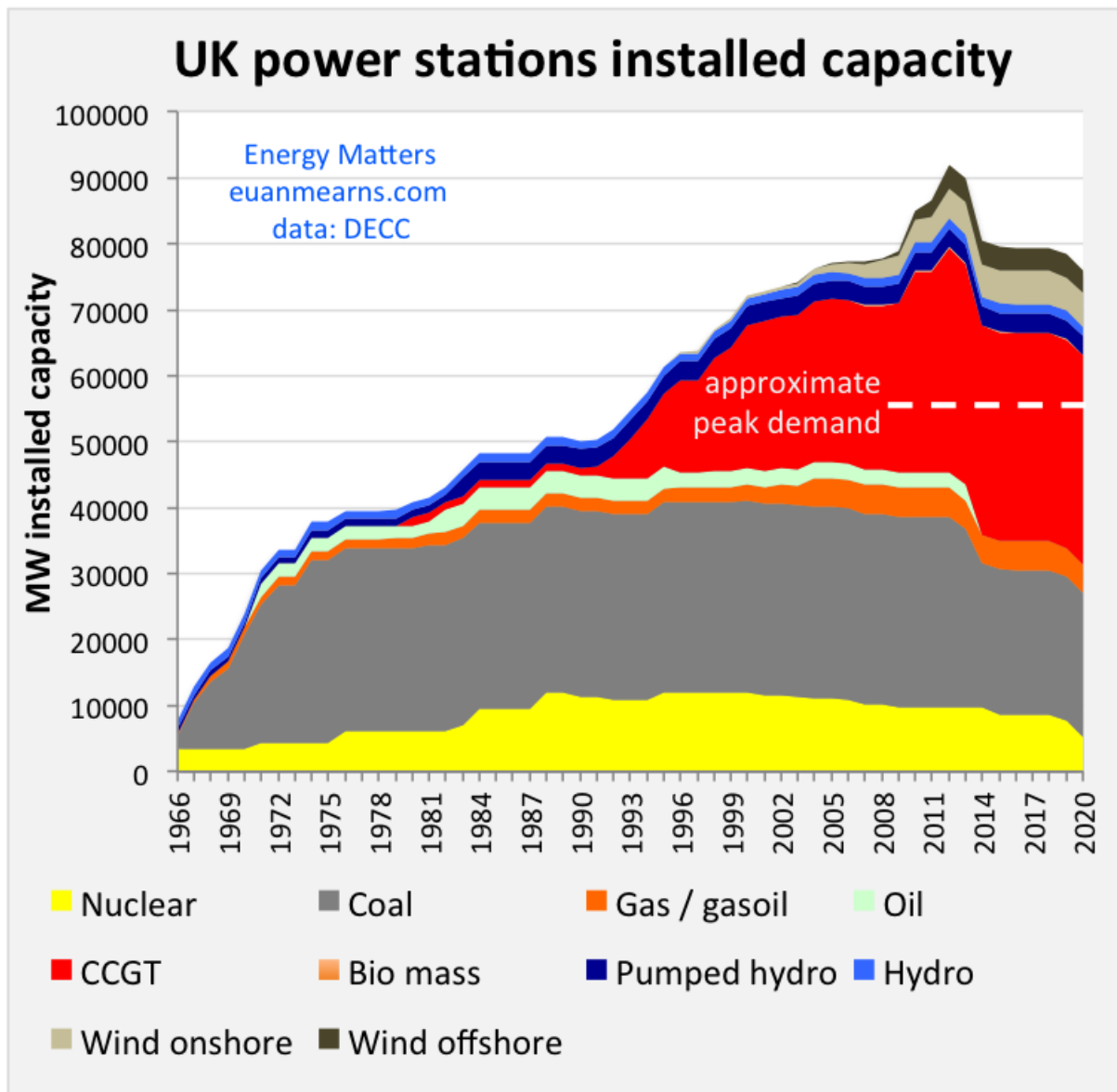
Holding the increase in the global average temperature to well below 2°C above pre-industrial levels and to pursue efforts to limit the temperature increase to 1.5°C above pre-industrial levels, recognising that this would significantly reduce the risks and impacts of climate change.

The red line shows the average global average temperature rise above pre-industrial baseline from 1990 where it was sitting at between +0.3C and +0.8 but I have selected +0.3C as the starting so that the global temperature rise above pre-

industrial levels are probably understated. Despite this, we have already crashed through the pre-industrial temperature rise target of +1.5C set by the Paris Agreement last year (2018) as shown by the red line on my graph. Global temperatures are rising exponentially at a rate of 6% year on year despite renewable electricity generation in Peta-Watt-hours shown in green rising at a rate of 5% year on year. Since 1990 over 104.4 Peta-Watt-hours (104.4 million billion Watt-hours) has been generated to no avail. CO2 from burning fossil fuels alone has risen at a rate of 1.45% year on year shown as the blue line. CO2 emissions from burning fossil fuels amounted to 886 Giga-tonnes and this almost doubles to 1600 Giga-tonnes when the CO2 from burning biomass is added. The real rate of CO2 emissions including biomass burning globally is 11.3% year on year shown by the black line on the graph.

Clearly, the intermittent generation of electricity and is not working. If it was, then the red, blue and black lines on my graph would be flattening out. We must stop generating all renewable electricity now in all its forms now. If we do and burn our remaining dwindling reserves of coal and gas the black line on my graph will flatten to the blue one.

In other words, if renewables never happened our planet would be in a much better place than it is now.



The graph above shows the reliance that the UK has on burning coal, gas, gasoil and oil to provide capacity of up to an approximate peak demand of around 55GW.

I call on the UK government to take the following steps to decarbonise electricity generation with zero CO2 emissions and still provide 55GW of electrical capacity 24-7-52.

Step 1 Ban the Importation of all Biomass used for the generation of Electricity.

Step 2 Declassify all intermittent generation of electricity as 'renewable'

Step 3 Cancel all contracts with suppliers of 'so called' renewable electricity.

Step 4 Adopt Andrew Mackay's Invention, Gentec WaTS. It will provide the UK with 55GW of capacity without burning anything at all.

Step 5 Instruct CCGT (32GW) and Coal Fired Operators (11GW) to generate 24-7-52 at full capacity at maximum thermal efficiency until their capacities are replaced by Gentec WaTS.

Step 6 Suspend Construction of Nuclear Power Station at Hinkley Point because it can be modified by changing the heat source from nuclear fission to heat derived from wind, waves, tidal streams or lagoons.

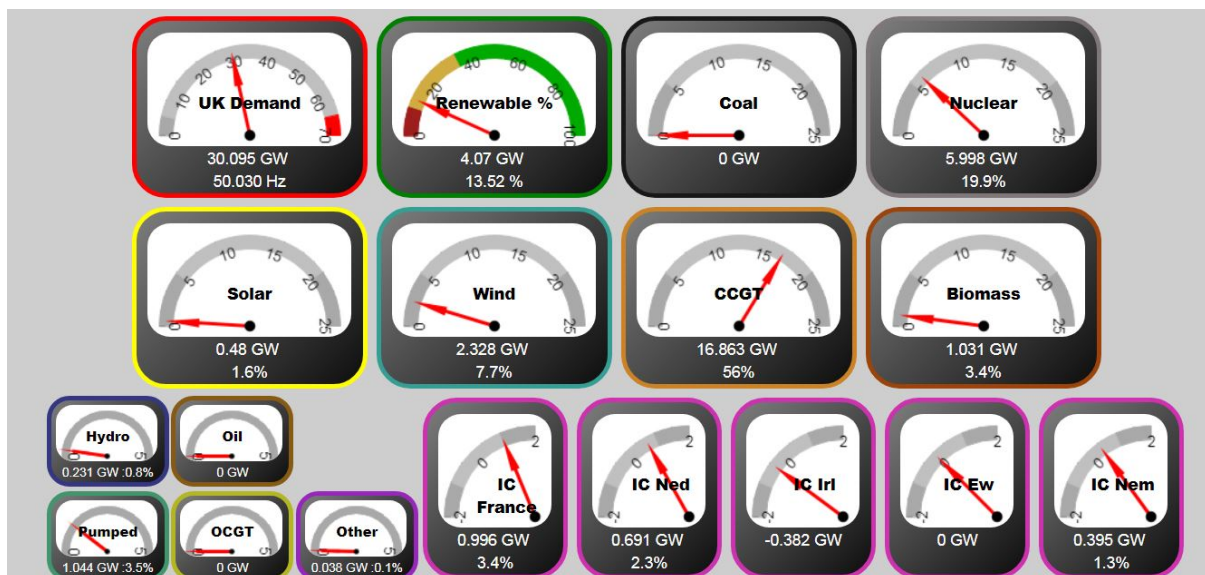
Step 7 Order the construction of at least three Gentec WaTS' desalination ships that provide enough water to irrigate the Sahara Desert for food and photosynthesis to give us all two atoms of oxygen back from every molecule of CO2.

Step 8 Convert existing coal fired and Biomass thermal power stations to run from thermal storage charged up from wind, waves and tides

Step 9 Build a new Varying High Voltage Direct Current (VHVDC) national grid for distribution of Gentec WaTS' power. VHVDC, if and when present, is used to charge up thermal stores. It is from these thermal stores that renewable electricity as firm capacity is generated 24-7-52.

Step 10 Convert existing wind, wave and tidal turbines to deliver VHVDC to the new national grid. (Existing HVDC from converter stations is acceptable without modification.)

Step 11 Install thousands of 'wind thermine' on wind farm land on a 30m x 30m grid. A wind thermine is no taller than 25 metres above ground level and converts wind directly into VHVDC, depending on its speed, for export.



Coal-fired power stations and CCGTs never shut down. The reading on the Coal dial should be reading 11.5GW all the time; the reading on the nuclear dial should be 9.5GW all the time; the reading on the CCGT dial should be reading 32GW at all times although the dial only has a full-scale deflection of 25GW. This means that coal, nuclear and CCGT are already providing a firm capacity of $11.5+9.5+32 = 53$ GW; this is the 'invisible generation and carbon emissions' that are accelerating us towards extinction. The demand in this snapshot is just 34.145 so the 18.9GW of overcapacity is discarded, apart from 2GW of nuclear/fossil-derived exports to France and the Netherlands.



More of the same rubbish with a 'coal free' day with CO2 belching out from Coal Power Stations, CCGTs and biomass plants are generating electricity hidden in the background that will never be consumed.

<http://euanmearns.com/co2-emissions-variations-in-ccgts-used-to-balance-wind-in-ireland/>

<https://theecologist.org/2019/apr/15/truth-about-renewable-subsidies>

<https://reader.chathamhouse.org/woody-biomass-power-and-heat-impacts-global-climate#>

April 2019