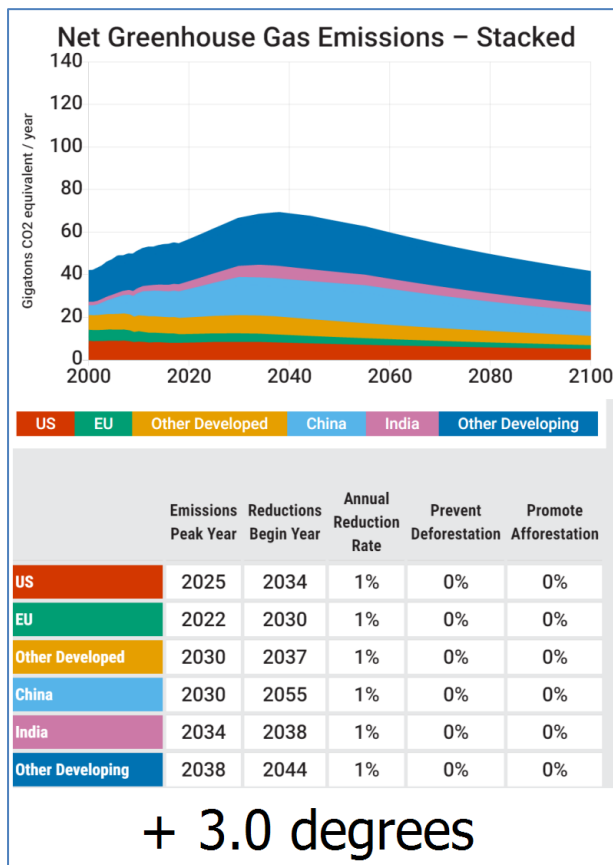


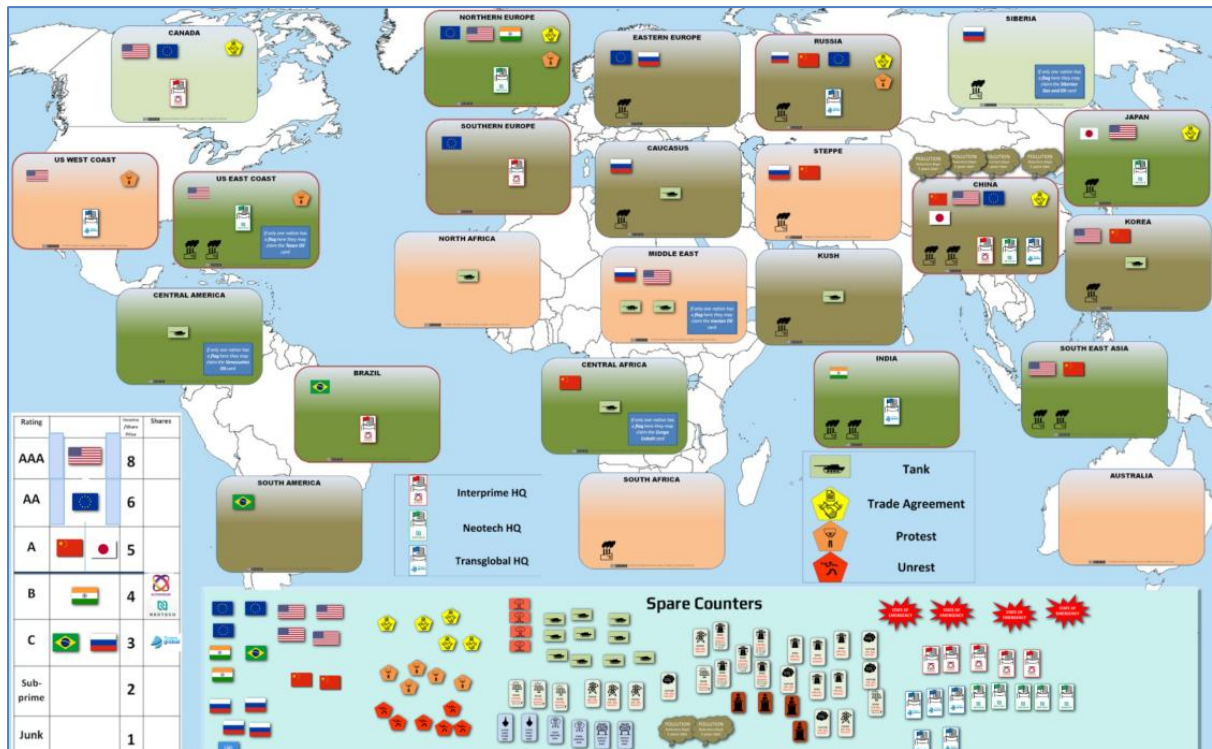
Climate Crisis

An online roleplay simulation using C-ROADS and game mechanics

The following is a write up of a game/simulation played over two 3-hour sessions. There were approximately 20 players in each session, representing national governments, global corporations and the United Nations. While a significant proportion of the players were interested to play the game because it included a focus on climate change, many of the players were simply interested in the format and playing a large multi-player game.



The C-ROADS model at the start of the game



The map at the start of the game

Climate Crisis – the world from 2024 to 2030

With the global economy emerging from recession, revitalised administrations announced their intent to build a 'better and greener' future.

2024

- US companies responded enthusiastically to US government tax incentives encouraging investment in Mexico, Venezuela and Columbia.
- Brazilian oil companies finalised a deal to exploit oil and gas reserves in and around the Black Sea.
- Trans Global corporation rolled out the first of its next-generation solar arrays - built just outside the Russian city of Sochi. Forecasts suggest that when fully online it will supply over 80% of the city's power requirements.
- The IPCC reported that its latest climate model predicts that by the year 2100 the world's average temperature will be 2.9 degrees higher than the pre-industrial average. Such an increase puts the survival of modern civilisation into question.

2025

- The world's first commercial carbon capture plant started operation outside Detroit. The plant is run by an industry consortium backed by the US government.
- Paramilitary terrorist attacks against US military bases and corporate buildings across Japan left hundreds dead and many more injured. The US government withdrew all

non-essential staff from Japan and advised US citizens to leave. The attacks were conducted by a Japanese nationalist group known as *Rising Sun*. This group was previously little known to authorities. It is thought to have links with North Korea and credible reports state that the military hardware used in the attacks came from Brazil. The Japanese Prime Minister called a state of emergency and ordered Japanese Defence Force units to patrol the streets.

- The forest fire season in California was one of the worst on record. The President ordered federal authorities to address the situation early and provided federal funding. FEMA was able to co-ordinate local, state and federal resources to minimise risks to citizens and property damage.
- Wild fires in Spain, Portugal, Greece and Italy plagued the EU throughout the summer. Local authorities were able to keep on top of the situation through the use of specialised drones which mapped the progress of the fires in real time.
- Interprime announced a contract with the Russian government to establish a smart power grid which will intelligently route power to where it is needed. This is predicted to provide 10-20% efficiency savings. Construction of the grid will start near Moscow's northern suburbs, where Trans Global plan to install another of their advanced solar arrays.
- The Brazilian economy suffered severe setbacks. Credit agencies rated Brazilian government and commercial debt as close to sub-prime. After weeks of riots on the streets of Brazilian cities and unable to attract international investment, the Brazilian President was forced to declare a state of emergency.

2026

- The US President announced that Congress had approved funding for two carbon reduction schemes. Firstly, the nation's aging nuclear power stations would be upgraded to use next-generation reactors provided by Trans Global. Secondly, after the success of the carbon capture plant at Detroit, new plants would be opening outside Atlanta, Portland and Sacramento.
- The French President and German Chancellor announced a programme of EU-sponsored joint stock ventures with firms in North and South Korea. The scheme is intended to encourage further progress on Korean re-unification, applying the experience gained from the successful re-unification of Germany in the 1990s.
- Pakistan revealed the deployment of an armoured brigade fielding Neotech's autonomous combat vehicles. These vehicles can be driven remotely and can also switch to a fully autonomous mode in which the onboard computer will make kill decisions without human intervention. The vehicles were manufactured at the Neotech plant outside Sao Paulo in Brazil and were supplied on the basis of ongoing Brazilian defence contracts.
- The Indian Prime Minister reacted to Pakistan's military deployment by declaring a state of emergency and ordering an Indian armoured division to the border. The UN

reminded the world of the dangers of conflict between these two nuclear-armed nations and called for de-escalation. When asked for comment, the Brazilian President's Office said that they expected to receive a large order for Neotech's autonomous combat vehicles from India shortly.

- Japan was devastated by the worst typhoons in living memory. Aid was swiftly provided by the international community under leadership of the US. The death toll was finally tallied at several thousand.
- A series of international climate summits hosted by China ended with world leaders announcing a world-wide tax on the use of petrol and natural gas burned for vehicle fuel or commercial power generation. The stock of major petrochemical companies dropped sharply.
- China stunned the global community by bringing in emergency laws to restrict all commercial activities linked with foreign exports or investments. Veteran China-watchers had warned about this as internal divisions in the Chinese Communist Party emerged at the last party congress. It appears the hard-line nationalist stance advocated by the Premier with the backing of the General Secretary of the Communist Party has won the day. Chinese companies with export contracts or significant foreign investment have been told they will need to apply for special licenses in order to continue their business.
- Japanese companies with links to China were in desperate efforts to try and reposition themselves. China's new stance on exports, combined with the domestic Japanese terror threat and higher than expected typhoon damage claims has meant that analysts regard the huge Japanese government debt as no-longer sustainable.
- Markets turned favourably towards Russia's economy, which appears to have successfully pivoted away from dependence on gas and oil exports towards a high-tech, green future.

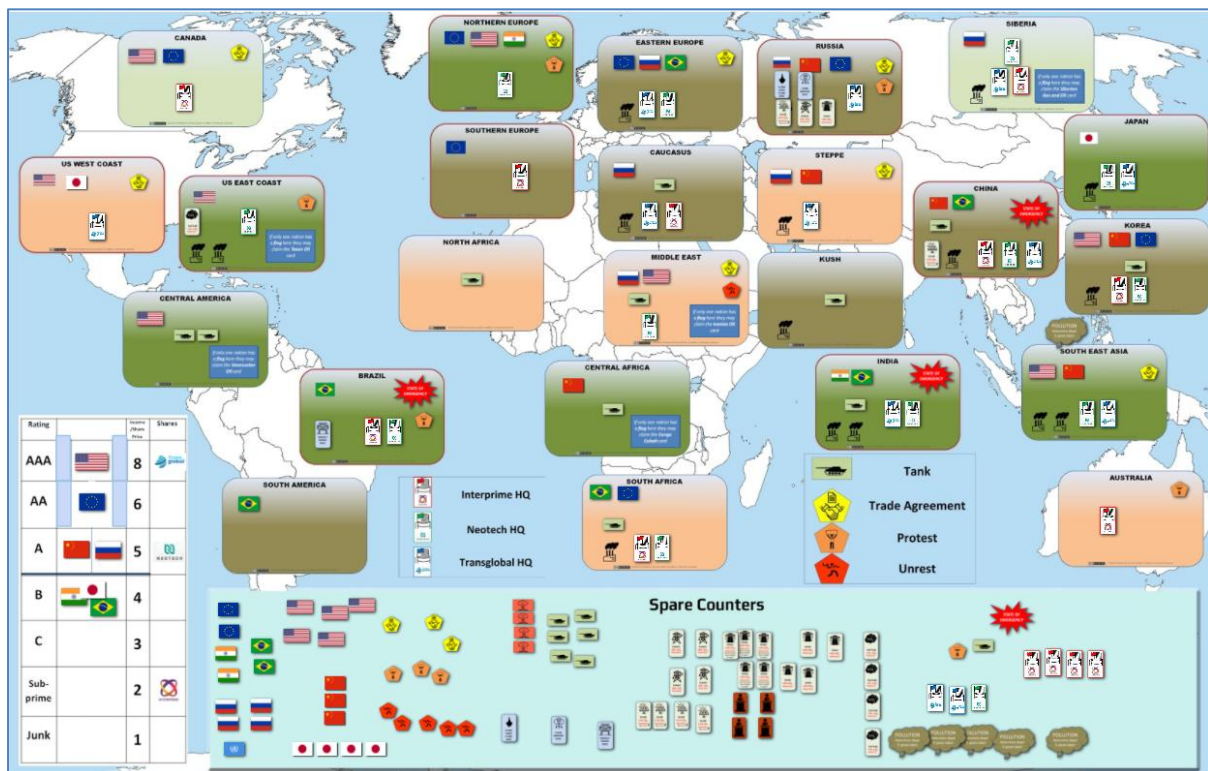
2027

- The Saudi air force conducted air strikes on Yemen's coastal cities. Tensions between Saudi Arabia and Iran very quickly ramped up and small scale border conflicts threatened to break out across the region. Riots broke out across the Middle East – some supporting and some condemning the Saudi aggression.
- Social media was flooded with memes drawn from the 1980s film 'Robocop' as Brazilian military officials and Neotech executives showed off the paramilitary version of the autonomous combat vehicles that have been deployed in India and Pakistan. Neotech announced that orders for these vehicles have already been received from various South African police departments and Chinese government security forces.
- The US President announced that he had signed an order to decommission 25% of US coal and gas-fired power stations. These power stations, situated mainly along

the east coast of the USA are some of the oldest plants and significantly contribute to the USA's carbon emissions.

- China maintained a nationwide state of emergency. The government announced that emergency measures were needed to deal with the series of storms which were predicted to hit China this year. Analysts suggested that emergency measures were more likely being kept in place to handle potential civil unrest as the Chinese economy endures one of the worst downturns it has experienced due to plummeting exports.
- The Russian President opened a section of smart highway running parallel to the M11 from Moscow to St. Petersburg. Neotech robotic vehicles will run along the roads, powered by electricity provided by Trans Global arrays and intelligently channelled by Interprime power networking to where it is needed.
- Trans Global corporation announced that on the back of its successful re-commissioning of US reactors, that it has been asked by the Russian government to investigate upgrading the aging reactors used in its submarine and icebreaker fleets with a view to re-purposing them for domestic power generation.
- The Chinese Premier opened a Trans Global solar array outside of Shanghai. Trans Global shares surged on the news that its solar arrays had been successfully deployed in a second nation.
- The Brazilian President once again declared a state of emergency after a series of riots in Brazilian cities. Police and military units were seen patrolling the streets along with Neotech's autonomous vehicles. A film crew claimed to have recorded the first purposeful killing of a human by artificial intelligence.
- The Russian President said that trials of its new space plane were successful and would allow it to take cargo to low earth orbit at a fraction of the cost of traditional rocket delivery. The President announced that in partnership with Trans Global, Russia would focus on landing cosmonauts on the moon as the first step to establishing a base there. Trans Global shares were down 30% at one point as investors dumped the stock, worried about the corporation being involved in such a risky and expensive venture.
- The United Nations Security Council authorised the deployment peacekeeping forces along various contested border regions in the Middle-east. The US would provide the majority of the forces but France, Germany and Russia would provide contingents for deployment in areas which were too sensitive for the deployment of US personnel.
- The IPCC released a report showing average global temperature rise by 2100 is predicted to be 2.6 degrees. While progress in addressing climate change was praised, it was pointed out that a temperature rise of 2.6 degrees would lead to a 90cm sea level rise by 2100. This would threaten the existence of low lying cities such as New York and London, as well as entire nations such as the Netherlands and Bangladesh in the coming decades.

- Australia endured one of the worst droughts on record as it entered the height of the summer.



The world in 2027

2028

- In response to Russia's announcement of a space programme to land a cosmonaut on the moon, the US President announced that the Artemis mission to return US astronauts to the moon would be restarted. Artemis was originally scheduled for blast off in 2024, but had been postponed and eventually put on hold due to funding difficulties.
- UN aid camps were set up in Oman to take in refugees from Yemen, where the short war has left widespread property destruction and displaced thousands.
- A new government was elected in India on a platform of combating corruption.
- A new Chinese Premier and General Secretary of the Communist Party were appointed, suggesting the isolationist stance of China may be softening.
- The outgoing UN Secretary General and Deputy Secretary General received the Nobel Peace Prize for their extremely quick reaction to tensions in the Middle East. The prize committee suggested that their action prevented further widespread conflagrations in the area.
- Trans Global landed a survey rover on the moon to gather geological data with a view to assessing the location as a site for a manned base.

- A UN sponsored peace conference between Pakistan and India continued throughout the year. One of the reasons for the talks taking so long was that the Indian representatives were plagued by accusations of corruption in the Indian press and were continually being replaced by the Prime Minister due to his zero-tolerance policy on corruption.
- Trans Global announced that it would be making a revolutionary solar-powered stove available in India. It would be cheap enough for villagers to afford and supply eco-friendly heating in areas where power is unreliable.

2029

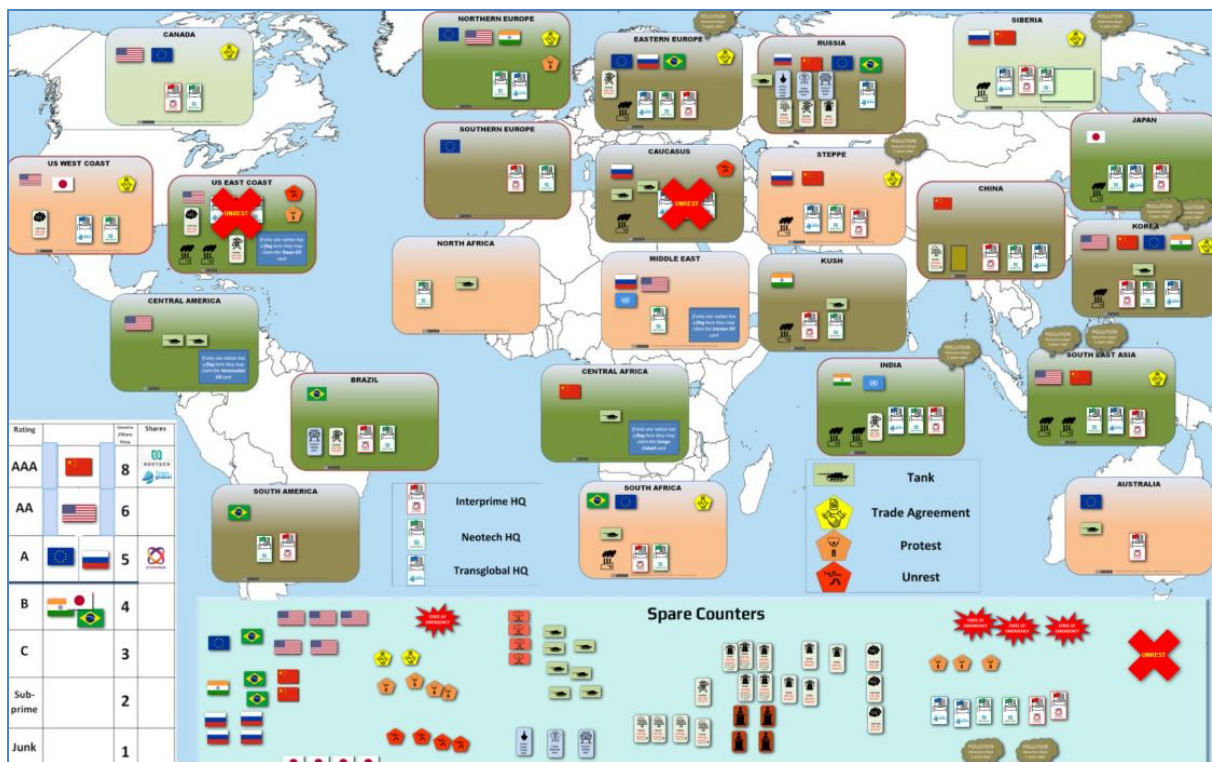
- Interprime announced plans for smart power grids in Brazil, Poland, Hungary, north-eastern USA and northern India. Construction work had already begun in Brazil and India and was scheduled to begin next year in the other locations.
- Trans Global's line of solar powered jewelry has become the sensation of fashion shows around the globe. The corporation reported that budget versions of the jewelry would be available for consumers later this year. Trans Global's shares reached an all-time high.
- A Category 5 storm hit the Philippines. The USA, China and India all pledged aid, but it was slow to arrive and was too little to address the effects of the widespread destruction in the wake of the storm. Analysts predicted that the Philippines' fragile economy will be severely challenged due to the level of destruction.
- China's credit rating was upgraded to AA as it emerged from a state of emergency and its economy recovered from the huge drop in exports to the west and benefitted from a revitalised domestic and regional economy. The Chinese government has also signed into law requirements on business to use of low-carbon power sources.
- NASA announced that the launch of the Artemis manned mission to the moon would be pushed back to 2032 due to funding being held back by Congress. There was no mention of the Russian plan to land a cosmonaut on the moon and experts predicted that any such mission is at least a decade away.
- UN peacekeepers supplied by the USA took up position on the Indian-Pakistan border.
- The Russian President announced the opening of the city of Neo Kaliningrad. Although only a small portion of the city centre has been constructed, the 'smart city' will interface directly with the technologies supplied by Trans Global, Neotech and Interprime to reduce the environmental footprint of its inhabitants.

2030

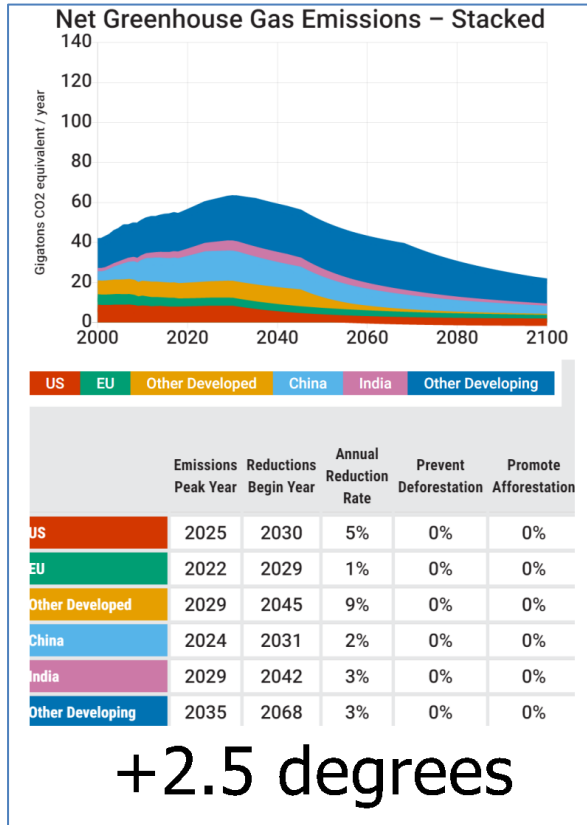
- Russia announced the establishment of a second smart city: Neo Novosibirsk. The President explained in a long and detailed press session that the city would welcome climate refugees. There were rumours that the Russian General Staff had attempted to persuade the President against any invitation of refugees to Russia, warning that it would be difficult to maintain the integrity of the Russian land border. Shortly after

the President's speech, some of the General Staff were reported to be on secondment at remote military bases in Siberia.

- Neotech assisted India in setting up a network of drones to monitor flooding risks and anti-flood measures in anticipation of a heavy monsoon season.
- China allowed its currency to float freely and the markets took to it enthusiastically. Many institutions holding dollars reduced their exposure to the US currency and bought the Yuan. The US economy faltered as the dollar collapsed in value and a huge inflationary shock hit home. Credit rating agencies upgraded China to AAA, and downgraded the US to AA.
- There was a military coup in Latvia as senior army generals took control of the civilian government, accusing it of losing sight of the 'Russian threat'. Latvian citizens were called up and Latvian tanks and heavy artillery were moved to the Russian border.
- China announced that all of its coal-fired power plants would be closed down in the next two decades and no new permits for coal-fired power plants would be issued. China is now widely seen as the global leader in decarbonising its economy.
- War broke out after a decade of peace between Armenia and Azerbaijan. Armenia appeared to be using Brazilian-made anti-tank weapons and armoured vehicles.
- The US President declared a state of emergency as rioting broke out in cities along the East coast and in the Mid-west. Falling living standards were seen to be the main driver of the unrest as inflation has eroded the spending power of the dollar. Order gradually returned after several weeks of the National Guard patrolling the streets of major cities.
- The latest IPCC report predicted that global average temperature will increase by 2.5 degrees above pre-industrial levels in 2100. While this was seen as a welcome move in the right direction, the IPCC stated that action by nations on climate change mitigation was too little and too late to be able to ensure that disastrous effects of climate change could be avoided.



The map at the end of the game



The C-ROADS Model at the end of the game

Climate change measure	CO ₂ Peak	CO ₂ Reductions begin	Reduction rate
USA starting parameters	2025	2034	1%
Worldwide Oil and gas tax		1 year earlier	
Decommission 25% coal power		3 years earlier	
2 Carbon Capture Plants			Increase rate by 2%
1 Smart Power Grid			Increase rate by 2%
END PARAMETERS	2025	2030 (4 years earlier)	Reduction rate 5%
EU starting parameters	2022	2030	1%
Worldwide Oil and gas tax		1 year earlier	
END PARAMETERS	2022	2029 (1 year earlier)	Reduction rate 1%
Other Developed start params	2030	2037	1%
Worldwide Oil and gas tax		1 year earlier	
Russia: Repurpose nuclear reactors	1 year earlier	1 year earlier	
Russia: Smart Power Grid			Increase rate by 2%
Russia: Advanced Solar Power			Increase rate by 1%
Russia: Smart Roads			Increase rate by 3%
E. Europe: Smart Power Grid			Increase rate by 2%
E. Europe: Pollution		5 years later	
Siberia: Pollution		5 years later	
END PARAMETERS	2029 (1 year earlier)	2045 (8 years later)	Reduction rate 9%
China starting parameters	2030	2055	1%
Worldwide Oil and gas tax	3 years earlier	1 year earlier	
Decommission 50% coal power	3 years earlier	3 years earlier	
Advanced Solar Power			Increase rate by 1%
Removal of 4 Pollution		20 years earlier	
TOTAL	2024 (6 years earlier)	2031 (24 years earlier)	Reduction rate 2 %
India starting parameters	2034	2038	1%
Worldwide Oil and gas tax	3 years earlier	1 year earlier	
TransGlobal cookers	2 years earlier		
Smart Power Grid			Increase rate by 2%
Pollution		5 years later	
TOTAL	2029 (5 years earlier)	2042 (4 years later)	Reduction rate 3%
Other Developing start params	2038	2044	1%
Worldwide Oil and gas tax	3 years earlier	1 year earlier	
Brazil: Smart Power Grid			Increase rate by 2%
Steppe: Pollution		5 years later	
Korea: 2 Pollution		10 years later	
S.E. Asia: 2 Pollution		10 years later	
TOTAL	2035 (3 years earlier)	2068 (24 years later)	Reduction rate 3%

A breakdown of the different model parameters and how they changed during the game.

So the world in 2030 is not a terrible place to live in – at least for the majority of the citizens of China, Russia and the EU, and most people in India will probably have noticed an increase in their standard of living and a new-found trust in officials. China and Russia made real progress at decarbonising their economies, however – the economic activity that was displaced from China, just shifted to dirtier (and cheaper) developing nations. Based on an analysis of the model parameters at the end of the game, the US and EU don't seem to have made as much progress in environmental terms, but they were playing a more global game. From what I can see from the text chat, they focussed their efforts where they would have most effect by contributing to other nation's climate change schemes or assisting with disaster recovery. Very laudable!

I am looking to run Climate Crisis again in late spring (March or April). If you want keep up to date with developments and/or play in the next run, then please join the discord server here: <https://discord.gg/57EqUrS>