

Climate Change and Nuclear Energy



THE NEW NUCLEAR
WATCH INSTITUTE



The World in

2020



Tim Yeo Chairman The New Nuclear Watch Institute



Action not words

In 2020 time isn't on our side. Preventing dangerous irreversible climate change requires a much bigger and faster response than anything previously achieved. So 2020 must be a year of more action and fewer words.

And it must be the right action. In 2015 the Nationally Determined Contributions (carbon emissions targets) at the heart of CoP 21 in Paris were a form of progress. Added up, however, these NDCs allowed a temperature rise of over 3 C. When CoP 26 ends on 19 November 2020 in Glasgow its decisions must go much further than Paris did to prove the world is serious about climate change.

Last year's 2 per cent jump in carbon emissions was bigger than the average of the last ten years. The recent UN Emissions Gap Report warned starkly "there is no sign of emissions peaking in the next few years and every year of postponed peaking means deeper and faster cuts will be required."

Setting net zero targets won't by itself reverse this upward trend or bring forward the date on

which emissions finally peak. All new targets set in 2020 must be backed by identified actions that are capable of achieving those targets by the specified date.

It's time for the energy industry, a big emitter, to take the lead in 2020. The technology to decarbonise electricity generation completely already exists. Deploying it requires immediate action, not fine words.

Investment in all low kinds of carbon energy, including nuclear, must grow in 2020. Carbon markets and taxes must drive carbon prices higher. Cross border tax adjustments, backed by the new European Commission President, must be introduced to prevent carbon leakage.

In 2020 building unabated coal plants must stop. Everyone knows it, some people talk about it and Europe is doing it. Elsewhere bankers, insurers and investors, all fearful of stranded assets, seem readier to act than governments.

"Nuclear should be treated equally with other low carbon energy sources. The strong case for including nuclear energy within the EU Taxonomy should be accepted in 2020."

Reality not fantasy

In 2020 energy policy must be anchored in reality. Fossil fuel fans argue that carbon capture utilisation and storage can enable their continued use. This is fantasy. Economically viable CCUS is no nearer being available today than it was a decade ago and big energy companies are no keener to invest heavily in researching it.

Modern economies depend on a continuous supply of electricity. Claims that this can be securely provided when 80 per cent of that electricity is generated from intermittent sources like wind and solar are another fantasy.

The flexible, large scale, long term, low cost electricity storage needed to make greater reliance on renewables safe isn't yet available. Making policy in 2020 on the basis that it will be soon would be recklessly irresponsible.

Reality also applies to cost comparisons between technologies. Last February the 6 GW Hornsea wind farm began generating electricity

at a price to British consumers of £155/MWh. That makes criticisms of the cost of Hinkley Point C impossible to justify in 2020.

The notion that renewable energy alone can fill the gap created by lower fossil fuel use is also a fantasy. Bloomberg New Energy Finance warned last month "the majority of power to be produced from the overall fleet of power plants added in 2018 will come from fossil sources and emit CO2. This is due to wind and solar projects generating only when natural resources are available while oil, coal and gas plants can potentially produce around the clock."

Indulging in energy fantasies is dangerous. It discourages, and can even prevent, investment in desirable solutions. In 2020 providers of low carbon electricity should work together. The nuclear lobby is ready to cooperate with the renewable energy industry, whose growth we welcome.

So in 2020 let nuclear start to play its part

Historically only two countries, France and Sweden, have ever cut carbon emissions in the past as fast as every country must now do in future. Both did so in the wake of the 1970s oil shock and achieved those cuts by investing heavily in nuclear. This lesson is particularly relevant in 2020.

Nuclear should be treated equally alongside other low carbon sustainable energy sources. The case for including nuclear energy within the EU Taxonomy is overwhelming and should be accepted in 2020.

Britain is blessed with enough sites already licensed for nuclear plants to allow a faster roll out of new capacity. In 2020 the government should replace its current piecemeal strategy with an invitation to companies to tender for building at least 10 GW.

This bolder approach will drive down costs and enable a strong supply chain industry to grow. The jobs it will create will win trade union support. Export opportunities will follow.

Starting the commissioning process in 2020 for more base load power will strengthen energy security just as the switch to electric vehicles and rapid growth in electricity intensive data processing technologies increases demand.

Finally in 2020 the government should reiterate consistent strong support for Britain's involvement in the development of small and advanced reactors.

Britain's new government has an unique opportunity to ensure its climate commitments are met safely and cheaply in a way which also delivers economic benefits. What better example can the host of the landmark CoP 26 set its guests?

Trends: 2020

Net-Zero: In light of the UK hosting the most significant UN climate summit since the Paris Conference in 2015, on both sides of the Atlantic ideas of a 'green new deal' will rapidly gain ground with the new EU commission targeting net-zero by 2050, and the US election candidate debating climate change. The UK pro-nuclear stance will give nuclear a chance in the spotlight at COP26 summit in Glasgow.

Climate: According to the UNEP report, a record volume of greenhouse gases were released into the atmosphere in 2018 - 55.3 GT. In order to keep to the Paris Agreement's 1.5°C target, emissions must drop by 7.6% p/a from 2020 to 2030 (2.7% p/a to keep to 2°C). 2020 is the deadline for countries to submit new or updated NDCs. Countries will be invited to communicate long-term mitigation strategies as part of the UNFCCC process.

Fusion: The new decade will rise on the launch of several thermonuclear fusion projects. CNNC will launch its HL-2M Tokamak reactor, aka "artificial sun", ITER will officially start its machine assembly in March, and Kurchatov Institute (Russia) will launch its T-15MD Tokamak reactor in December. The UK pledges to boost nuclear fusion R&D and also plans to open a research centre in Rotherham.

SMR: The year will kick-start with the confirmation of a roadmap between CEA, EDF, and Westinghouse for implementing the Nuward SMR project. Rosatom plans to launch the world's first commercial

SMR (the Akademik Lomonosov FNPP) in Pevek, Russia. The NRC plans to complete its review of NuScale's design in September.

EXTRA: WHAT TO WATCH...

Russia will: load fuel assemblies with several accident tolerant fuel (ATF) rods into an operational VVER-1000s; commission the Belarusian NPP; is expected to start construction of the power unit No.1 of the El-Dabaa NPP in Egypt and active construction works at units 2 and 3 of the Akkuyu NPP in Turkey.

China will launch its first export Hualong One unit – the Karachi unit 2 in Pakistan. Four more units (2 Hualong One and 2 ACPR-1000) are scheduled to be commissioned in China.

France is expected to launch the first EPR in Europe at the Olkiluoto-3 NPP in Finland.

Korea will complete its first APR1400 reactor export, as the Barakah NPP in Abu Dhabi will become fully operational.

January

13-16 Well and truly recovered from December and January festivities, an opportunity to promote nuclear as a clean source of energy will present itself in Abu Dhabi, UAE, as the annual World Future Energy Summit will take place, attracting more than 30,000 visitors.

20-21 The 6th CEE Nuclear Industry Congress 2020 in Prague, Czech Republic, will bring together companies involved in all areas of the NPP cycle to address the Central &

Eastern European market. This forum will become particularly interesting the more the Czech Republic plans to integrate more nuclear power into its energy mix.

22 The Nuclear Fuel Supply Forum, which will take place in snowy Washington, USA, will provide information on policy issues related to the nuclear fuel industry. Key policymakers will be present.

In January Rosatom will start to celebrate 75 years of the country's nuclear industry.

February

3-4 With clean energy remaining a top priority, the first of the BNEF Summits will take place in San Francisco, USA, and will provide ideas and connections into how to shape a cleaner, more competitive future.

10-14 The IAEA is organising the 3rd International Conference on Nuclear Security at its HQ in Vienna, Austria. It will be a forum for policymakers and nuclear security experts on the future direction for nuclear security.

12-13 There will be high profile speakers sharing their knowledge and expertise on overcoming current challenges, at the Nuclear Decommissioning & Waste Management Summit in London, UK.

13 6th Conference on Small Nuclear Reactors will traditionally take place in the large auditorium of the FNSPE CTU in Prague, Czech Republic.

20-21 An opportunity will arise to generate new business and maintain long-term relationships at the International Power

Summit in Hamburg, Germany.

26-28 The World Smart Energy Week in Tokyo will present all cutting-edge technology in clean energy.

March

Meanwhile, in the UK, a final planning decision on the Wylfa NPP (Wales) is expected to be made...

3-4 ...and in London, DIT Civil Nuclear Showcase will bring together nuclear supply chain firms as well as vendors from Canada, Central Europe, China, France, Germany, Japan, South Korea and the United States.

3-4 What is needed to meet the rapidly growing need for energy access in Africa will be discussed at the Africa Energy Indaba conference in Capetown, South Africa.

4-5 In Istanbul, Turkey will be held Nuclear Power Plants Expo and Summit, attending which is the best way to keep up to date with the latest developments in Turkey's booming nuclear industry.

8-13 With thoughts on the coming of spring, Diversity in Nuclear will be celebrated at the International Youth Nuclear Congress in Sydney, Australia.

22-26 A highlight of the European Research Reactor Conference in Helsinki, Finland, will be a keynote speech presenting insights into the TRIGA Fuel Production restart at the Framatome CERCA facility.

29-2 The International Conference on Physics of Reactors, will focus on how to make nuclear scalable. It will be held in Europe (Cambridge, UK) for

the first time in 12 years.

30-1 A chance to exchange and showcase knowhow will be possible at the Power & Electricity World Africa in Johannesburg, South Africa.

April

31-03 Beijing, China will host Nuclear Industry China – a great event that is expected to bring together the world nuclear industry leaders under one roof.

8-9 In April, there will be many interesting events in America. The first will be the largest SMR & AR meeting point in the world with over 500 key decision makers and industry leaders in Atlanta, USA - SMR 2020...

19-24 ...The second, will be the most important international symposium on everything concerning nuclear fusion - Technology of Fusion Energy – in Charleston, USA.

20-22 The annual World Nuclear Fuel Cycle Conference will connect companies with cutting-edge information and emerging trends which affect the nuclear industry. It will take place in Stockholm, Sweden.

20-21 ...A look into the economics behind the energy transition will present itself at the third interesting event in the US - the BNEF Summit in New York.

27-29 Meanwhile, in St Petersburg, Russia, industries, state figures and scientists will exchange ideas at the Russian International Energy Forum.

May

11-15 Nuclear safety will remain a top priority for the nuclear industry

and the International Conference on Operational Safety of Nuclear Power Plants in Beijing, China, will provide a great avenue in which to exchange ideas and learn about cutting-edge technologies.

12-13 The city of Munich, in Germany, will become a hub for nuclear discussion as it will host the first International Nuclear Supply Chain Symposium and...

12-14 Capetown, South Africa, will host a African Utility Week, trade exhibition and conference, gathering the largest group of power, energy and water professionals in the African market.

13-15 In Tashkent, Uzbekistan will be held a Power Uzbekistan exhibition that is a major event in Central Asia dedicated to power, power equipment and alternative energy sources.

19 ... a BNEF Summit, both of which will present a chance to connect with experts and participate in lively discussions.

20-22 An opportunity to be part of "A New Momentum" will appear in Washington, USA, as the city will host the Nuclear Energy Assembly.

June

10-11 Bulatom - the Traditional Bulgarian Nuclear Forum Conference will take place in Varna, Bulgaria.

15-19 Halfway into the year, Rosatom will host the International Conference on Nuclear Knowledge Management and Human Resources Development in Moscow, which will offer practical solutions to the hiring challenges faced in nuclear.

23-25 As Parisians bathe in the sun by the Seine, the French capital will host the World Nuclear Exhibition - the leading marketplace dedicated to the global civil nuclear community.

26 Meanwhile, in rainy New Delhi, India, the BNEF Summit will focus on the energy industry as part of the Indian economy.

29-3 The IAEA will host yet another conference in Vienna - the International Conference on the Safe Transport of Radioactive Material.

30 EDF is expected to shut down the Number 2 reactor of its Fessenheim NPP (oldest in France).

July

1-3 Under the sweltering July sun, thousands will gather at the largest nuclear industry fair in Seoul, Korea – the World Nuclear & Radiation.

9-10 Academics will meet in Prague, Czech Republic, for the International Research Conference on Nuclear Power and Energy Security.

15-20 As the humid weather continues in South East Asia, Japan will offer training programmes for future leaders on nuclear energy, radioisotope production, and applications of ionizing radiation in medicine and industry at its World Nuclear University Summer Institute 2020.

21 Whilst in America, the city of Washington will host the one-day Nuclear Fuel Supply Forum, which will provide information on policy issues related to the nuclear fuel industry.

August

As the Summer comes to a close, the first concrete will be poured at the Changjiang NPP in China.

September

9-11 Hundreds of top nuclear energy professionals will gather under the last British summer rays, as the UK capital hosts The World Nuclear Association Symposium, for a diverse programme of presentations, interviews, and panels on the most important industry issues today.

21-25 Meanwhile in Vienna, as in every September, representatives of the IAEA Member States will meet for the General Conference to consider and approve the IAEA's budget and to decide on other issues raised by the Board of Governors, the Director General and Member States.

As the leaves turn gold in the US, the NRC is expected to complete its design certification review of NuScale's SMR and 600-MW 12-unit plant, Shin Hanul units 1 and 2 should become operational at the Hanul NPP in South Korea (the completion date had been extended 11 months prior).

October

12-17 Reaching the end of the year, and the climate topic will remain of primary concern. The IAEA will demonstrate its commitment to sustainability by organizing its 28th Fusion Energy Conference in Nice, France as a 'green meeting' (according to the guidelines of the Austrian Ecolable)

13 Over the Channel, London will become a hot spot for discussing sustainability, as the Energy

Intelligence Forum will focus on how to develop sustainable solutions to the energy challenges of the 21st century, and...

19-20 ...the final BNEF Summit of the year will debate clean energy solutions for the energy transition.

As the air becomes cooler in China, the first concrete will be poured at Xudabao NPP's Unit 3.

21-23 Africa Nuclear Business Platform (AFNBP) conference will take place in Accra, Ghana with the theme "Nuclear Power in Africa - A Key Step Toward the Industrialization of the Continent".

November

9-13 The last month of Autumn will see the final IAEA conference in Vienna, Austria. The International Conference on Radia-

tion Safety: Improving Radiation Protection in Practice will identify the key challenges in radiation protection that need to be addressed by the international community, as well as possible solutions.

9-19 About 30,000 delegates and 200 world leaders will attend the COP26 UN Climate Change Conference in Glasgow, UK.

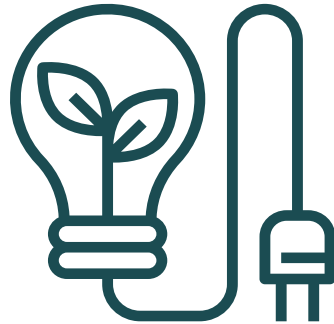
24-26 The 9th International Conference on Nuclear Decommissioning in Aachen, Germany, will address the current aspects of nuclear decommissioning, including the resulting experience.

December

15-16 With lights shining through Bangkok's smoggy streets, it is clear that the state of our climate will continue to be a burning topic up to the end of the

year, as experts gather for the 14th International Conference on Climate Change and Global Warming in Thailand.

30 China will end the year with a boost of energy, as Unit 5 of the Tianwan NPP will enter commercial operation.



Alan Raymant

Chief Executive of Bradwell B
CGN UK

In 2020 all of us in the nuclear industry should hope for and expect leadership and vision for our sector.

From the UK Government we look forward to an Energy White Paper with a commitment to a significant role for nuclear in achieving its 2050 decarbonisation goals. We anticipate too a new funding mechanism based on the Regulated Asset Base model. And we hope for support in finding sites on which new nuclear can be developed.

We should not, though, sit back and wait for the Government to tell us what to do. There is a big onus on the nuclear industry itself to agree a roadmap envisaging how all of the effective technologies will be deployed. Starting with large reactors now, and small modular reactors, high temperature reactors and fusion as they come on stream.

Such a roadmap will need to set an ambitious target for new capacity required to support the Government's

climate objectives, and a realistic plan for making a step change in the skills and capabilities of the UK supply chain.

And finally we will all need to show how the cost of nuclear is going to come down. This requires a programme to deliver a fleet of power stations rather than the project-by-project approach adopted to date.

There is a lot to do. But with so much attention on the climate change agenda this is our moment to set out and start to deliver an industry-wide vision for the future of nuclear.

Kirsty Gogan

Co-founder and Executive Director
Energy for Humanity

The UN's "bleak" conclusion this year that CO2 emissions must decline 7.6% p.a. beginning in 2020 — a rate currently nowhere in sight — to meet Paris targets.

The inconvenient truth is that global emissions increased 1.5 % annually over the past decade, and annual emissions have doubled in the 30 years since we first made climate commitments.

Looking back with 20/20 hindsight, we must make an honest appraisal of our climate efforts to date and use this insight to determine new strategies going forward. We are at a watershed moment in protecting the earth's climate. We need to go beyond wishful thinking and crunch the numbers properly if we are to succeed in making a rapid, just and meaningful low carbon transition. Hard-headed economics and sound analysis are just as important as following our hearts.

Yves Desbazeille

Director General
FORATOM

2019 was a good year for nuclear at EU level as there were many positives signs around the continent implying that nuclear has a bright future ahead. Many EU Member States, European Commission, European Investment Bank or even the European Parliament (recent resolution on COP25) have recognised the role nuclear has to play thanks to the benefits it provides.

With the growing support towards nuclear observed at EU level, it's important to underline this is not the end of the process, but — quite the opposite — its beginning and the "fight" is far from being over. The year ahead will be a decisive one with many EU legislative acts (European Green Deal, Sustainable Finance, European Climate Law, etc.) being planned to be approved. The outcome of this process may accelerate or block the future development of nuclear capacity in Europe. Many other Member States (such as Austria or Luxembourg) are radicalising themselves against nuclear energy and trying to impose their opinions on other countries. Also, not all of the plans announced by the new EC President show that nuclear will be treated on an equal footing with other low-carbon energy sources.

That's why, in the upcoming twelve months, a lot of work has to be done by the whole European nuclear industry and all pro-nuclear forces to guarantee that nuclear will remain an important element of Europe's energy mix. The window of opportunity is limited, so I hope we won't miss this opportunity and everybody will put extra effort to reinforce nuclear energy's position in Europe.

Dr Jonathan Cobb

Senior Communication Manager
World Nuclear Association

Next year should see an exciting range of reactors based on new designs, new technologies and in new countries coming on-line, supplying clean and reliable electricity.

My hopes for 2020 are that we will be able to build on this momentum and see the start of construction of many more reactors worldwide, as well as maximizing the contribution made by reactors already in operation.

Finally, looking beyond 2020, I hope many governments will embrace the potential of nuclear energy and include it as key part of their long term climate change strategies for COP 26.

Andrey Rozhdestvin

CEO of Rosatom Western Europe,
Vice President of Rusatom International Network

In 2020, we not only expect to develop "conventional" large-scale NPP construction projects, but also other sectors of our business, which are equally important for decarbonizing the global economy. We will continue to actively pursue our developments in the field of SMRs, as well as in the low-carbon non-nuclear energy segment, including, for example, wind energy. In addition, implementing nuclear science and technology centre projects is among our priorities for next year, as well as advancing project proposals in medicine.

Rauli Partanen

Science Writer and Analyst on Energy, Environment, Society & Economy, Chief Executive Officer
Think Atom

I hope that 2020 is the year when the nuclear industry fully comes out of the closet it has been hiding in for so long. It has an amazing product: Clean, affordable and environmentally very sustainable energy source that can meet our needs 24/7. It has a tiny waste-stream that has been managed responsibly like no other industry has for decades. The industry should be proud of this and show that pride to the rest of society. If the people working in the industry are not proud of themselves and excited of their product and the possibilities it offers us, how can we expect anyone else to be?

