

Nuclear power forms an important pillar of many countries' climate change mitigation strategies

By Miklos Gaspar

“Climate change is a common challenge faced by all nations, and it is important that the international community joins together to combat this challenge.”

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The need for climate change mitigation is a salient reason for an increasing number of countries considering nuclear power within their national energy portfolios, according to IAEA experts and government sources.

“Concerns about climate change is one of the drivers for countries to introduce or to expand their use of nuclear power,” said David Shropshire, Head of the IAEA's Planning and Economic Studies Section. Other factors include growing energy demands and the desire to increase energy security and reduce dependence on volatile fossil fuel costs, he added.

or close to two years of global emissions at current rates, according to the International Energy Agency's latest *World Energy Outlook*. By 2040, nuclear energy will have prevented the release of four years' worth of CO₂ emissions.

Nuclear power is a key part of China's clean energy plan

Increasing the capacity and share of nuclear power in its energy mix is one way that will help China meet its pledge to reduce greenhouse gas emissions after 2030. China, which alone accounts for over a third of nuclear power reactors under construction around the world, sees nuclear power as a clean source of energy that will help combat both global and local environmental problems, while contributing to the country's growing economy, said Ambassador Jingye Cheng, China's Permanent Representative to the United Nations and Other International Organizations in Vienna.

“Climate change is a common challenge faced by all nations, and it is important that the international community joins together to combat this challenge,” said Cheng, who is China's ambassador to the IAEA. “China will do its part, and nuclear energy is part of the solution.”

Making its economy more energy efficient and increasing the share of renewable energy sources are other important parts of China's climate change mitigation plans, he added.

“While for the time being still relying on fossil fuel sources, we are putting more emphasis on the development of low-carbon resources,” Cheng said. The country's National Energy Development Strategy Action Plan set a 15% target for non-fossil energy sources by 2020, compared with just under 10% at the end of 2013.

China has 23 nuclear power reactors in operation, 27 under construction and several more about to start construction. Additional



Nuclear power plant under construction in China.

(Photo: C. Brady/IAEA)

New nuclear power stations will help the United Kingdom reduce its greenhouse gas emissions by 80% by 2050 and secure its energy supply, according to the UK Government's policy paper *2010 to 2015 Government Policy: Low Carbon Technologies*. “Nuclear power is low carbon, affordable, dependable, safe and capable of increasing the diversity of energy supply,” the paper says. France has the fourth-lowest carbon dioxide (CO₂) emission rate per GDP among Member countries of the Organization for Cooperation and Development (OECD) “thanks to its fleet of nuclear power plants,” says the French Government's sustainable energy policy paper.

Nuclear power has saved the release of an estimated 56 gigatonnes of CO₂ since 1971,

reactors are planned, including some of the world's most advanced, to provide more than a three-fold increase in nuclear capacity to 58 gigawatts by 2020. The reactors under construction will have a combined capacity of 30 gigawatts.

China is facing a grave ecological situation and is taking steps to address climate change, Cheng explained. Its national plan on climate change includes the establishment of a carbon emission trading market, as well as deepening international cooperation on the reduction of greenhouse gas emissions under the principle of 'common but differentiated responsibilities'. In its nuclear energy

expansion plans, the country is focusing on the construction of large pressurized water reactors and the development and piloting of high temperature gas cooled reactors and fast reactors, Cheng said.

China's track record in the safe and secure operation of its nuclear power plants and the piloting of its new, third generation reactor design position it as a global player in nuclear technology, Cheng said. "We stand ready to share our expertise and technology with, and provide financial support to, newcomer and expanding countries."

Julie Sadler also contributed to this article.

What is climate change?

Climate change is a topic everyone is talking about, but what is it and why is it happening now?

It's important first to note that the Earth's climate is always changing; global average temperatures and weather patterns fluctuate yearly, but over great periods of time scientists can identify and examine climatic trends. In the past, changes in climate have been attributed to solar activity, plate tectonics, volcanic activity and even biotic processes. However, the current climate change that's being reported in the media is not related to these natural processes. What's happening is 'anthropogenic climate change', or human-caused climate change, a phenomenon that's been in the making since the industrial revolution.¹

The factors involved in anthropogenic climate change are varied, but the world's most authoritative voice on the topic, the United Nations Intergovernmental Panel on Climate Change, has stated that greenhouse gases, particularly carbon dioxide (CO₂), are the major cause. CO₂ is a gas, a chemical compound that's released when fossil fuels like coal, oil, and natural gas are burned. Plants absorb CO₂ during photosynthesis, but the current rate of emissions exceeds the capacity of plants and other 'carbon sinks'² to remove CO₂ from the atmosphere.

Since 1900 the global average temperature has risen by 0.7 degrees Celsius, and the effects of climate change are already occurring. Some of the expected and observed impacts of CO₂ emissions and

climate change include: changing precipitation patterns; shrinking glaciers; Greenland and Antarctic ice sheet mass loss; decreasing Arctic sea-ice extent; thawing of permafrost; natural disasters like heat waves, droughts, floods, cyclones, and wildfires; and ocean acidification.

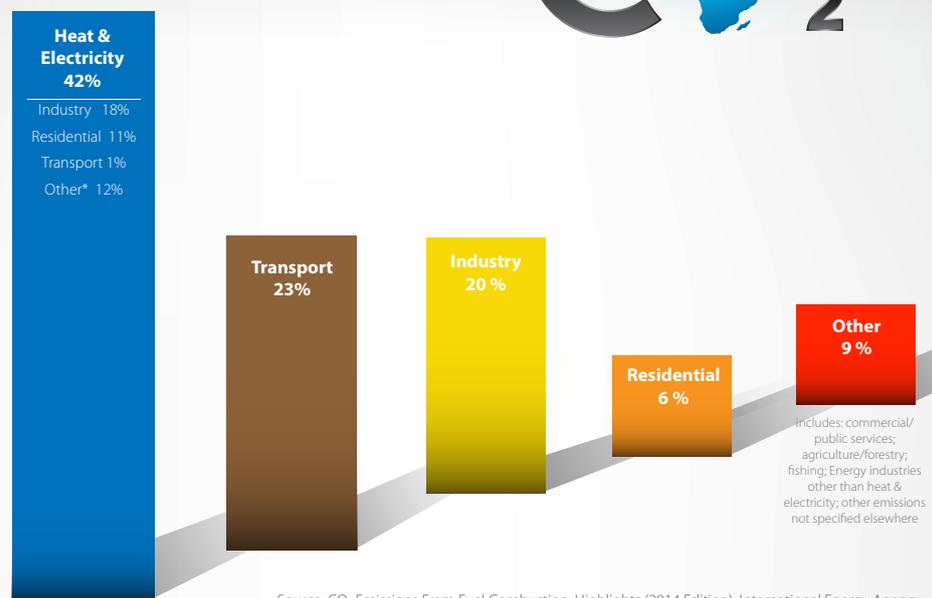
¹ IPCC, 2014. *Climate Change 2014: Synthesis Report, Summary for Policymakers*, www.ipcc.ch/pdf/assessment-report/ar5/syr/AR5_SYR_FINAL_SPM.pdf.

² Carbon sinks are reservoirs that accumulate and store carbon-containing chemical compounds for an indefinite period, and include oceans, forests and soils.

World CO₂ emissions by sector in 2012

Two sectors combined, Heat & Electricity and Transport, represented nearly two-thirds of global emissions in 2012.

Note: Also shows allocation of heat & electricity to end-use sectors.



Source: CO₂ Emissions From Fuel Combustion, Highlights (2014 Edition), International Energy Agency