

Cognition and Misunderstanding of Climate Change Caused by Carbon Dioxide

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As the top priorities for the people's livelihood and sustainability, green and low-carbon development as well as energy conservation and emissions reduction are hot topics of China's "Two Sessions" each year, and this year is no exception. In the Report on the Work of the Government released at China's "Two Sessions" several days ago, "promoting the green transformation of development modes and making steady progress in energy conservation and emissions reduction" have been listed as key tasks in the first year of realizing the great rejuvenation of the Chinese nation through Chinese-style modernization. Based on it, the ecological civilization construction in the country has also entered a new stage of in-depth propulsion.

Green and low-carbon development as well as energy conservation and emissions reduction are grand propositions of the times that need to be propelled by joint forces from all walks of life. It not only requires the top-level design of the government, but also relies on the solid practice of all parties of the industrial chain. Zhongzhou Energy Conservation is such a high-tech enterprise who is dedicated to achieving the high-quality development through energy conservation and emissions reduction. Led by Chairman & Academician Lu Guoquan, the company, under the goal of "wishing to succeed around the world" and the mission of "transforming solid waste to energy, eliminating smog, and cooling the Earth", has made its own contribution to the construction of ecological civilization in China with more than 60 patents on environmental protection innovations.

Misunderstanding of Carbon Peaking and Carbon Neutrality should be Avoided

The green transformation is a process, but not a thing that can be done overnight. We must make steady progress and gradually realize this goal based on national conditions. We should not lose touch with reality and rush to achieve results by reducing carbon through campaigns and 'slamming on the brakes'. -- During the "Two Sessions", Chinese President Xi Jinping's speech on correctly understanding and gasping the goal of carbon peaking and carbon neutrality has made the hot topic of how to implement the strategy of carbon peaking and carbon neutrality in an orderly manner arouse heated discussions once again.

Having engaged in energy conservation and environmental protection for years, Lu Guoquan has his own unique insights on

the implementation of this strategy. In his opinion, the strategy of carbon peaking and carbon neutrality driven by smog control and climate change tackling is an inherent requirement for high-quality development, which can help to guide innovation in green technology, facilitate the transformation of industrial and energy structure, and improve the industrial and economic competitiveness around the world. However, when advancing this strategy, the misunderstanding of carbon dioxide must be avoided.

For a long time, in the popular perception, carbon dioxide emitted after energy combustion has been blamed for climate issues such as smog and the greenhouse effect, but Lu Guoquan thinks this conclusion is clearly biased. He explains: The molecular mass of carbon dioxide is 44.0095, while that of air is 29. The proportion of carbon dioxide in air per cubic meter is about 0.031%, which is about 30% heavier than air. It is similar to the proportion after the combination of oil and water. This also means that over 90% of carbon dioxide emissions will descend, participate in the material cycle of nature as the raw material of photosynthesis, and neutralize the problem of rising alkali content or alkalosis in seawater, soil, humans and animals. Meanwhile, it is also the energy needed for the work of the human neutral nervous system and applied in industry and the food industry. Therefore, almost all emissions are neutralized and used by the natural cycle of nature, and only less than 10% will be lifted up to the sky for various reasons. This small amount of carbon dioxide plays a minimal role in causing the greenhouse effect, and can block direct, oblique and reflective sunlight. It's basically a balance of merits and demerits, with little difference.

According to Lu Guoquan's thinking, if carbon dioxide is not the reason, what is the real cause of various climate problems? Through repeated experiments and tests, Lu gave his own answer: Thermal pollution emissions from energy combustion are the real cause of climate issues. We burn a kilo of coal to generate carbon dioxide of about 0.5 cubic meter, but generate heat that can raise the temperature by 1°C for about 16 million cubic meters of air. This conclusion is apparently the complete subversion of the existing theory and achievement system. When people are suspicious about it, he has proved himself right with cold emission technology for energy combustion he has invented, the first of its kind in the world, which has already been applied in

many cases for a few years (100-300°C emission currently in the world, but 10-35°C for this cold emission technology). Under equal conditions, this technology can save energy by 30%-50%, and achieve room temperature emissions under the principle of less burning and fewer emissions. Besides, carbon dioxide discharged in high concentration can also be made into dry ice for industry, the food industry and plant factories as plant starch through cheap directed recycling to achieve the nature's law of natural neutralization.



曾投资并帮助经营了几家金属公司

International projects with standard energy combustion emissions discharge a large amount of energy, thermal pollution, aerosols and particulates, which are the root causes of smog, the Earth's heat island effect, and the formation of extraordinary rainstorms after the thick cumulus cloud layer caused by the rise of a lot of water vapor and particulates encounters strong cold air.

Cold Emission is the Policy of Addressing the Root Cause

Through experiments, Lu Guoquan found that coal will generate a large amount of heat after combustion, which can cause fog and aerosol emissions for the cold and heat exchange with cold air. With thermal emissions, PM2.5 can be lifted up by heat and wrapped in fog to form smog. In the meantime, car exhaust also generates heat, and hot exhaust collides with cold air to form the cold and heat exchange, which will further result in smog. "We can tell from it that the reason for the generation of smog is the exchange between hot and cold air." Based on this conclusion, if energy combustion does not generate heat, or generate as little heat as possible to block the cold and heat exchange, can climate issues caused by it be completely addressed?

Following this idea, Lu Guoquan has fully devoted himself to the research and development of cold emission technology. In 2012, through numerous attempts, he finally developed a boiler with the lowest exhaust gas temperature, most eco-friendly emissions and highest energy efficiency in the world. The heat it has emitted is only 10-35°C, which is not much different from the ambient air temperature, and will not generate mist. Without thermal emissions, soot particles will not be lifted up to the sky. At the same time, the boiler can achieve the energy efficiency of over 95%, which enables coal and garbage to be maximally utilized, but not to produce soot. Without mist and soot, smog cannot be formed, and emissions without heat can also relieve the heat island effect in cities. Besides, there is no phenomenon of extraordinary rainstorms, caused by the convection of the smog layer, which is several kilometers thick and formed by long-term thermal emissions and rising water vapor, with cold air. When the heat is discharged into the air, for every 1°C of temperature rise, there will be 7% increase in water taken away from the ground, which is also responsible for drought in many regions.



本新技术处理生活垃圾热解+气态燃料或燃煤热解后做到了冷排放,以零温排放,与国际上的同行相比没有烟囱,冷却塔了。热效率由国际上21%提高到现在90%以上,节约能源约50%,实现了以少排少排为原则,排放二氧化碳被捕捉制成干冰定向给植物工厂生成植物淀粉和氢气或给食品、工业利用与自然定向中和,对雾霾属于根治法则,对缓解地球热岛效应有着巨大的贡献,冷排放了。二氧化碳可以廉价捕捉制成干冰定向中和与工业、食品业使用,对排放的高厚层级的水汽遇冷空气形成的雾霾是根治法则。本项目处理桂阳县生活垃圾,工业园区家具废料,供128家企业蒸汽、空调、热水、压缩空气,全程无废水、废气排口,热解气态燃料残渣经重金属后成有机肥,打造零碳、零废、内循环经济示范区。

"It's worth mentioning that the chimneys of other boilers are made of brick or steel, but our heat-free boiler may be made of PVC tubes, which are light, thin, corrosion resistant, cheap and durable. In the future, the chimney will be no longer needed because the directed recovery of carbon dioxide to plant factories after clean combustion and emissions can achieve natural neutralization, and follow the law of natural cycle." The carbon dioxide demand of plants is about 1000-1500PPM, but the content in urban air is around 410PPM and that in suburban areas is less than 300PPM. We can reasonably remove carbon dioxide and make full use of it with technology. Besides, there is not a lot of carbon dioxide on Earth. In 1750 during the Industrial Revolution, when fossil energy was not exploited, and there were 700 million people all over the world, the content of carbon dioxide per cubic meter of air was 280PPM. Nowadays, when there are 8 billion people in the world, more than 11 times the population in 1750, the content of carbon dioxide per cubic meter of air is 410PPM, an increase of approximately 42%. As fossil energy remains the main energy, forest coverage and the greening rate see a year-on-year growth of around 10%, which absorbs a great deal of carbon dioxide to generate oxygen needed for people that has been multiplied, and follows the natural cycle and conservation law of nature. Nothing on Earth is superfluous, it is just a matter of thinking, perspective, cognition and how to apply and use them, Lu Guoquan introduces.



处理大学1600学生的生活垃圾,产生冷热空调给学生宿舍供暖及生活热水,冷排放,本项目排放二氧化碳排放(项目太小没作回收)。

The success of the boiler with “cold emission” has further strengthened Lu's confidence in driving energy conservation and environmental protection with technical innovation. Over the next few years, he has led his team to constantly make technical breakthroughs, and inject new impetus into China's green and low-carbon development and energy conservation and carbon emissions causes through a number of technological innovations.

“Our core technologies are high-temperature anaerobic pyrolysis + gas-carbon suspension combustion technology and cold emission technology.” Lu said that high-temperature anaerobic pyrolysis technology can dry water in waste into distilled water, separate oil and organic gases from it at low temperature, and pressurize oil and gases into the mist state, ensuring the sufficient burning and quaternary catalysis of hazardous gases in the furnace through oxygen-rich gas, carbon and oil suspension. “Through cold emission technology, the furnace temperature can support constant suspension combustion at round 1000°C. The discharge temperature of power generation from waste incineration is 180-260°C in the world, but our technology can make gas emission temperature maintain at 10-35°C.” Lu explains that this temperature is much the same as the ambient air temperature. Without thermal emissions, PM2.5 cannot be lifted up by heat and wrapped in fog to form smog, which also eases the hot island effect in cities.



本项目处理校园生活垃圾、大件垃圾、园林垃圾30吨天。热解+气炭燃烧。采用补供调峰方式以补秸秆、太阳能光热、燃气、电的多能互补方式供校园中央空调冷热、2万人生活热水。冷排放技术。有二氧化碳排放。热效率由国际上的传统发电技术21%提高到现在的90%以上。

In October 2019, the Chinese Academy of Sciences (CAS) issued a novelty search report, which proved Zhongzhou Energy Conservation's waste incineration technology is the first of its kind in the world. In December 2019, the Ministry of Science and Technology and the Ministry of Ecology and Environment organized an expert evaluation, which concluded that this technology is an international advanced technology. In December 2018, the Ecology and Environment Department of Hunan Province and the Department of Science and Technology of Hunan Province also jointly approved the promotion of the company's technology. So far, this technology has owned 19 national patents, including four invention patents. In 2021, with this technology, the company won the First Prize of International Ecology (two winners from China, namely Professor Chen Ping from CAS and Professor Lu Guoquan).

Afterword: As a forerunner in advancing the high-quality development of energy conservation and environmental protection through technological innovation, Lu Guoquan has independently developed almost 60 national patents. Among them, many results have been transformed into productive forces, and brought remarkable economic and social benefits. Thanks to his outstanding contribution, Lu Guoquan has been successively conferred a number of honorary titles, such as White Boiler Prince of the World, Inventor of Addressing Symptoms and Root Causes of Smog, Outstanding Contributor to China's Low-carbon Economy, Influential People of the Year, one of Top 10 Outstanding Innovation Entrepreneurs, Most Beautiful Scientific and Technological Worker, Think Tank Expert in Global Climate Change, etc. Honor is an encouragement as well as an impetus. In the future, he will continue to lead his team to explore in science and technology and environmental protection fields, and strive to make greater contributions to the progress of ecological civilization and the high-quality development of economy and society in China.