Sound of Science (理聲)

Newsletter of Science Society

June, 2012 二零一二年六月號

Can China create the solutions to our energy problems?

It may look like a jumble (一團混亂的) of pipes and towers, but as I stand on a nondescript (難以形容的) industrial estate 150 kilometres (93 miles) south east of Beijing, I cannot help feeling a bit like an awestruck (震驚的) pilgrim (朝聖者) in the presence of what may be the world's best hope for a workable solution to our energy troubles. The newly opened GreenGen energy plant in Tianjin is the most advanced clean coal power station – and if that sounds like an oxymoron, well suspend your disbelief a little longer.

This Tianjin plant places China at the vanguard (先鋒) of global efforts to use coal resources without releasing carbon dioxide. In 2008, the G8 group of nations supported the launch of 20 large-scale projects demonstrating technologies for carbon capture and storage by 2010. But delays and cancellations have meant most countries have made heavy work of enforcing the plan.

Which is why I have travelled to Tianjin. China uses more coal than the United States, Europe and Japan combined to fuel its economic boom. With

coal supplies providing more than two-thirds of the country's electricity needs, power stations have been opening at a rate of one a week for the past several years. Reports say vast（廣闊的）swathes of northern China have been mined to satisfy the unceasing（不停的）demand for coal, leaving millions of people living precariously（危險地）on the land above. So it's perhaps the last place you would expect to see what is in front of my eyes.

But here it is: China's first self-developed integrated gasification（氣化）combined-cycle (IGCC) power station. This plant produces 250MW of electricity by converting coal to 'syngas' – a mixture of carbon monoxide and hydrogen – which is then be used to drive turbines.

It's a far cleaner and more efficient way of using coal.

For a start, the sulphurous pollutants that stain the sky and obscure the sun over Chinese cities are almost entirely scrubbed by the IGCC process for recycling. So too are nitrous emissions and other impurities, including mercury and soot. This efficient method produces just one-tenth of the usual carbon dioxide emissions – and the best bit is the greenhouse gas is streamed out in an almost pure form, making it easy to capture and store. However, it is more expensive to produce electricity this way – a cost of around 80 cents per hour, compared to 50 cents per hour for regular plants – although the company intends to slash（减低）costs through further efficiency innovations（革新）.

Currently, the 3,000 tonnes of CO2 produced by the facility is being sold at a profit to beverage companies to make fizzy drinks, but GreenGen's owner, the state electricity giant Huaneng Group, plans to sequester（隔離）the gas – as much as 3 million tonnes a year – in off-shore oil wells in the nearby Bohai Sea to aid oil recovery there.

Yes, oil recovery – another greenhouse-gas emitting fossil fuel... China may well be forging ahead of the pack in carbon capture technology – it is already licensing its IGCC technology to a US gasification company – but curbing carbon dioxide emissions still falls some way behind economic development priorities, as is the case elsewhere. A couple of months ago, Huaneng opened the world's largest post-combustion carbon dioxide capture facility at Shidongkou outside Shanghai. The plant captures an impressive 100,000 tonnes of CO2, ostensibly to sell to the beverage (飲料) industry. But, this quantity of gas far exceeds the requirements of the soft drinks industry – the rest of the carbon dioxide is simply released into the atmosphere.

科普講座

科普講座名稱	日期	時間	地點	講員
何謂通識教育？— 來自科普實踐的啟示	6月9日（六）	2:30 – 4:30pm	香港科學館演講廳	李逆熵博士（香港科普作家）
通識教育的自然史基礎	6月16日（六）	2:30 – 4:30 pm	香港科學館演講廳	李逆熵博士（香港科普作家）
通識教育的文明史基礎	6月23日（六）	2:30 – 4:30 pm	香港科學館演講廳	李逆熵博士（香港科普作家）
科學與人文的融通 — 通識教育的最高境界	6月30日（六）	2:30 – 4:30 pm	香港科學館演講廳	李逆熵博士（香港科普作家）

本校朱倩嫿(3D)、高芷晴(3D)、黎欣儀(3E)及黃洁瑩(3E)同學贏得由香港水務署主辦的「節約用水大鬥法」比賽。並取得中學組的特別獎（全港第三名）；另外，林敏芝老師及陳小茹老師亦榮獲公開組的優異獎，特此恭賀。

SCIENCE SOCIETY 2011-12
CHAIRPERSON: MAK SHUN KI 麥順淇 **4E**
COMMITTEE MEMBER:
LAU WAI NIM 劉威念 **4A, LEE KA HANG** 李嘉恒 **4A, TANG PUI KEI** 鄧珮琦 **4A, LAM HO LIM** 林皓廉 **4D,WONG CHUN FUNG** 黃進鋒 **4D, CHAU IRIS** 周雅詩 **4E & CHIK CHUNG YIN** 植頌然 **4E**

Sudoku! ^_^

All video shows of this term have already finished. Thank you for your participation. See you next year!

1			9				4	
		4						2
	9	6	3					7
7				4	1	3		
				7				
		3	2	9				8
3					6	8	9	
8						4		
	5				9			1

Previous Answer:

7	6	1	3	4	9	8	2	5
9	3	4	2	8	5	7	6	1
8	2	5	1	7	6	3	4	9
2	4	6	9	1	8	5	3	7
5	7	9	6	2	3	4	1	8
1	8	3	7	5	4	2	9	6
4	9	8	5	3	1	6	7	2
3	1	2	8	6	7	9	5	4
6	5	7	4	9	2	1	8	3

Here's the Science Quiz =p (1/6 – 30/6)

Q1. GreenGen energy plant in Tianjin is a clean coal power station. (T/F)

Q2. 'Syngas' is a mixture of carbon dioxide and hydrogen.(T/F)

Q3. Fizzy drink is made of CO_2. (T/F)

Q4. Oil recovery is another greenhouse-gas emitting fossil fuel. (T/F)

Q5. Which country below has not mentioned in the article?

A. China B. the United States C. Japan D. Thailand

Previous Answers (1/5 – 31/5):

Q1. T Q2. F Q3. F Q4. T Q5.C

You can use the answer sheet on the right to answer the question. Collection box is put on the book shelf outside Staff Room. <u>The students who answer all correct will be given a special gift.</u> Everyone can submit one answer sheet only. Thanks for your participation!

Name: _____

Class: _____(___)

1. _____ 4. _____

2. _____ 5. _____

3. _____

Hope you can find out the answers and know more about Science!