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## ALTERNATIVE ENERGY

### China's solar target crucial for the global industry

China's new target for solar power has global implications for a world struggling with climate change. In May, the central government set a target of 70 gigawatt (GW) of solar photovoltaic power plants by 2017. Solar hit 20 GW in China last year, when the world set a new solar power record, adding 39 GW. Solar's global growth averaged 48% annually between 2009 and

last year, more than double that of wind power. Surging orders will fill excess capacity and restore balance sheets. More factories and research into better solar cells by Chinese manufacturers is the likely result. In the medium term solar prices will continue falling, performance will rise, and profits may pick up. But the revenues of grid companies could face pressure as rooftop solar installations reduce the demand for power from far-off generators. More solar and wind power will also require the laying of new power lines, such as the ultra-high-voltage network being built in China. China's rooftop, or distributed, solar target of for this year is 8 GW out of a total of 14 GW. Distributed solar can be more efficient than far-flung large power plants because power is produced near where people need it. All else being equal, more distributed solar points to a smaller grid, plus lower carbon emissions and cleaner air, the South China Morning Post reports.

### Pricing for offshore wind projects set

The National Development and Reform Commission (NDRC) released a pricing scheme for offshore wind power projects with no-bid contracts that will be in operation before 2017. The on-grid price (tax-included) for intertidal wind power projects is CNY0.75 per kilowatt-hour, while that for coastal schemes is CNY0.85 per kWh. For projects to be put into operation after 2017, the pricing scheme will be formulated separately. The new prices would give offshore projects an annual return of at least 12%. China should have 5,000 MW of offshore wind farms by the end of next year, rising to 30,000 MW by the end of 2020. The China Wind Energy Association said China installed 39 MW of new offshore wind farms last year, down 69% from 2012. The cumulative installed total was 428.8 MW at the end of last year, of which 300.5 MW were on inter-tidal shores and 128.1 MW in near-shore waters. China has the world's fifth-largest bank of installed offshore wind farms, after Britain, Denmark, Germany and Belgium. Offshore projects cost twice as much to build as onshore ones and are more challenging technically, which means they require higher power prices to achieve the same rate of return. Offshore wind power projects set to launch this year are expected to add 1,566 megawatt (MW) of capacity, or more than three times the national total as of the end of 2013, according to the Chinese Renewable Energy Industries Association. The country's offshore wind capacity was 428.6 MW at the end of 2013, less than a tenth of the government's 5,000 MW target for 2015.

### China to raise rooftop solar power subsidies by up to 55%

China plans to increase the subsidy on power sales by rooftop solar farm developers to state-owned power distributors by up to 55%, and compel the latter to act as an agent for collecting power bills if the developers directly sell to local customers. The consensus plan was reached after a meeting between state-backed financial institutions, bank regulators and the National Energy Administration (NEA). It is aimed at relieving financing difficulties that have hindered installations, and is pending final approval by Beijing. Currently, rooftop projects are entitled to a state subsidy of CNY0.42 per kilo-watt-hour (kWh) of output, on top of whatever prices developers manage to get from end-users. If the developers fail to sell all of their output to local users, local power grid operators are obliged to buy the remainder at prices that typically vary from CNY0.35 to CNY0.45 per kWh. The new policy will allow the rooftop projects developers to receive a total revenue of CNY0.95 to CNY1 per kWh, matching that of ground-mounted projects. This means the rooftop subsidy could rise by 31% to 55% from the current CNY0.42, sharply boosting viability. The NEA has set a 14 GW target for installations of solar farms this year, up from 12.9 GW last year. Some 8 GW of the target is for rooftop projects, and 6 GW for ground-mounted ones, mostly in remote areas. However, less than 2 GW of rooftop projects were installed in the first five months of this year as banks were reluctant to lend, the South China Morning Post reports.

### China raises investment in biomass

The Chinese government has agreed to raise investment in biomass technology. It plans to finish 120 biomass-fired boiler demonstration projects by 2015. Biomass is defined as biological material—generally farm or forestry byproducts—that can be used directly via combustion to produce heat or indirectly after conversion to various forms of biofuel. The pilot projects, valued at CNY5 billion, will be built across the country but with a focus on the Beijing-Tianjin-Hebei region, Yangtze River Delta and Pearl River Delta, which are noted for concentrations of heavy smog and haze. The projects' completion will provide energy equivalent to 1.2 million metric tons of coal and will reduce carbon dioxide emissions by more than 5 million tons. The program aims to build an entire industrial chain from fuel collection to

biomass furnace construction. Simon Parker, CEO of DP CleanTech, an international biomass solutions provider and a newcomer in China's biomass market, said biomass will play a bigger role in the renewable agenda in China. He said the natural resource that comes from an estimated 800 million tons of agricultural and forestry waste is the biggest available fuel source in the world today. "The potential in China is massive, and the only place with similar potential is Brazil," he said, forecasting a continued growth rate of 40% to 50% in China's biomass market in the next five years, the China Daily reports.

### Sino-Dutch consortium funds feasibility study on tidal energy

A Sino-Dutch consortium is spending tens of millions of U.S. dollars on a feasibility study for a project to harness tidal energy to produce clean power. Eight Dutch engineering firms and university institutes have joined Chinese industry and academic partners in the venture. The project, worth up to USD15 billion, would also need to have its environmental impact assessed. It has the potential to help China lessen its dependence on foreign suppliers and increase production of clean energy to help cut air pollution. The venture carries immense risks as its viability can only be proven if a full-scale project is built. "The biggest challenge is that the project must be done on a big scale in order to be economically viable," Rob Steijn, one of the inventors of the technology. He is Director of the River, Coast and Sea Department at Amsterdam-based infrastructure design and consulting firm Arcadis, which plays a coordinating role in the consortium led by infrastructure design and construction firm Strukton.

Steijn said that after 30 months of studies, the partners are confident in the science and believe a project between Shantou in Guangdong and Xiamen in Fujian has higher feasibility compared with an alternative project at the entrance to the Bohai Sea in the north. He said the southern project has 5,000 megawatt (MW) of annual generating capacity and is estimated to cost USD15 billion to build. It is about 10% more expensive than a Chinese nuclear power plant – among the most expensive – on a per MW basis. Analysts said this means the tidal project will need greater state subsidies than offshore wind turbines, already among the most expensive to produce and turn a profit. The Dutch consortium has spent about USD4 million on a three-year preliminary feasibility study that will be completed at the end of this year. The Dutch government contributed USD1.27 million. "Mass commercialization of tidal power is very far away, maybe it will happen by 2050," said Lin Boqiang of the Xiamen University Center for China Energy Economics Research. "Chinese research institutions may be looking into its feasibility out of our nation's desire to enhance energy security and tackle pollution, but the cost-competitiveness thus far is highly doubtful," the South China Morning Post reports.

### Taiwan solar stocks slump after U.S. calls for raised duties

Taiwanese solar stocks led by Motech Industries fell in July after the U.S. proposed expanded penalties on solar energy imports in a victory for the U.S. unit of SolarWorld, which accused China of shifting production to Taiwan after it lost an earlier case. Gintech Energy, E-Ton Solar Tech and Neo Solar Power also tumbled. The U.S. Department of Commerce issued a preliminary finding that said overseas producers, including China's Trina Solar and Taiwan's Gintech, sold goods in the U.S. at unfairly low prices, and called for duties ranging as high as 165% for some Chinese manufacturers and 44% for those in Taiwan. China hopes the U.S. can handle anti-dumping and anti-subsidy probes on Chinese solar products "cautiously," the Chinese Ministry of Commerce said, calling for a quick end to the probes. Jennifer Liang, Taipei-based Analyst at KGI Securities, said the duties were higher than the market expected. "The U.S. accounted for about 30% of Taiwanese solar-cell shipments in the past year and a half," she said. The duties will prompt Taiwanese producers to rely more on Japanese and European markets, she added. A final decision by the U.S. Commerce Department will be made in mid-December. The U.S. International Trade Commission (ITC) will determine by the end of January whether U.S. makers of solar power goods were harmed by the imports. If so, the duties will be permanent. U.S. imports from mainland China and Taiwan of the crystalline silicon photovoltaic cells, panels and modules used to make electricity from sunlight were valued at USD2.2 billion last year, the South China Morning Post reported.

### Storage solutions and adaptations to power grid needed

China will have to adapt its power grid to use more of its installed solar and wind capacity. Wind farms are built faster than the power grid, designed for conventional energy, can adapt. Consequently, wind operators in some places are paid at times to idle a fifth of their turbines. The problem partly arises because wind and solar, while steady over the long term, fluctuate in

the short term. Output peaks can clash with usage peak times on the power grid. Adding more power lines, which takes several years, is the standard solution. However, additional capacity is often underutilized, like empty highways during the day or late at night. Storing electricity is the alternative. For a century, the only realistic storage was pumped hydro. Compressed air, flywheels and molten salts are now gaining attention. The biggest advances are seen in falling prices for advanced chemical batteries. Like solar, batteries are modular, installed in days and work equally well whether distributed among consumers or concentrated in remote storage stations. Storage will increase the economic use of variable renewable energy. For example, batteries near renewable-energy generators soak up electricity otherwise lost to grid congestion. Distributed solar and distant wind farms, when the grid has spare capacity, can charge batteries near consumers. However, developing storage solutions is not simple. In China, State Grid runs the large-scale Zhangbei demonstrator in Hebei province, while battery manufacturer BYD has batteries deployed in Changsha, Hunan province. While other countries are also working on solutions, the world's biggest storage targets will probably be in China. With experience elsewhere limited, how China optimizes value and integrates storage will be globally significant for policy and the fortunes of manufacturers in a critical new sector for sustainable electricity, Ecological Economist David Fullbrook suggested in the South China Morning Post.

## EU-China solar deal fails to offer dumping protection

The European Union's deal to end a trade dispute over solar panels with China risks creating a downward spiral of prices, further damaging the EU producers it is designed to protect. The EU agreed a year ago to allow up to seven gigawatt per year of Chinese solar panels imports free of duties at a fixed minimum price of €0.56 per watt. However, that undertaking includes a potential change to the minimum price each quarter, based on a solar module price index compiled by Bloomberg. The price was cut to €0.53 euro in April. China's Chamber of Commerce for Import and Export of Machinery and Electronic Products in July wrote to the European Commission seeking to clarify certain aspects of the undertaking. EUProSun, which represents about 40% of EU producers including Germany's SolarWorld, said the chamber's clarification was in fact a rewriting of the deal and would result in a continuous decline in prices in Europe. China wants currency fluctuations to be taken into account.

- Weldtech Technology, a Shanghai-based provider of energy conservation services for central air-conditioning systems, plans to spend a total of over HKD200 million this year and next year to complete 195 new projects. The target of the firm, which is controlled by Citic Group, is ambitious, compared with the 39 projects completed since Weldtech's first project in 2010.
- Ralls Corp, owned by two executives of Sany Group, scored a victory in a lawsuit in the U.S. brought against President Obama. In 2012, Obama used a presidential order to block the purchase of four wind-farm projects by Ralls near a navy base in Oregon. A U.S. federal appeals court now ruled that the presidential order did not follow due process of law. Ralls should be given access to any unclassified evidence the President relied on to make his decision, the court said.
- China could invest as much as USD5.7 trillion by 2035 to explore, produce and save energy, accounting for 15% of global spending in the sector, according to a June report from the International Energy Agency (IEA). China will invest USD1.6 trillion in energy efficiency by 2035, accounting for about one-fifth of the global total. Transportation will be the largest target, accounting for about 71% of the USD1.6 trillion, followed by industry and the building sector.
- Zhuhai-based Singyes Solar Technologies Holdings unveiled plans to raise CNY930 million through a five-year convertible bond issue. The proceeds will be used to repay debt and fund expenses. Upon full conversion into shares, the bondholders will own a 9.4% stake in Singyes. Last year, Singyes sourced 60% of its revenues from solar project engineering and renewable-energy equipment production, and the rest from curtain walls and materials. Net profit for last year surged 49.3% to CNY490.6 million as revenue jumped 34% to CNY4.15 billion.
- The National Energy Administration (NEA) unveiled its solar power development targets for 2014, vowing to install 13 gigawatt (GW) of new capacity this year. Director Wu Xinxiong said the NEA would strive to secure the target by supporting the development of distributed solar power generation. The goal is more ambitious than the State Council guideline released in July last year, which outlined plans to install 10

GW of solar power capacity annually in the 2013-15 period.

- China added 3.3 gigawatt (GW) of solar capacity in the six months to June 30, doubling last year's additions, the National Energy Administration (NEA) said. Utility-scale photovoltaic power plants accounted for 2.3 GW of the new capacity in the first half, with distributed projects comprising the remainder. Xinjiang led the way, with 900 MW of photovoltaic power plants in the first six months followed by Inner Mongolia, Qinghai and Shanxi.
- Privately-held renewables company Hanergy Holding Group, headquartered in Beijing, has acquired Alta Devices, a California-based developer of high-efficiency thin-film solar cells. It is the fourth acquisition by Hanergy in the past two years. Alta Devices' CEO Chris Norris said their advanced solar technology can be used in unmanned systems, consumer devices, remote power, automotive industry and the Internet of Things. However, they need a company like Hanergy, with a broad global presence, to help them bring their technology from the laboratory into the factory.
- From September, China suspended applications from solar companies to import polysilicon under processing trade rules whereby material used in domestic manufacturing is exempt from import duties if the finished product – in this case solar cells used in panels – is exported. The suspension is mainly aimed at U.S. polysilicon. China in January imposed anti-dumping charges of as much as 57% on imports from U.S. polysilicon makers including Hemlock Semiconductor, REC Silicon and SunEdison.
- China Datang Corp Renewable Power expects wind farm utilization to pick up in the year's second half after dropping in the first half because of weak wind resources. The Hong Kong-listed unit of China Datang Group was aiming for full-year plant utilization of at least 1,850 hours, down 7.6% from 2,001.5 hours in last year's first half. China Datang posted a first-half net loss of CNY14.4 million, compared with a CNY231 million profit in the same period last year. Revenue fell 6.8% to CNY2.57 billion, with a 9.1% drop in wind power output partially offset by a 2.8% rise in the average power price.
- GCL-Poly Energy, the world's largest producer of polysilicon and solar wafers, reported that net profit for the first six months of the year amounted to HKD900.4 million, compared with a loss of HKD917.3 million a year earlier. First-half revenue surged 52.4% year-on-year to HKD17.22 billion, driven mainly by a 53% rise in its solar material business to HKD11.89 billion.
- China's solar panel makers are pinning their hopes on rising demand for solar power generating greenhouses to offset heavy losses in the U.S. and European markets. A new type of solar greenhouse roof is expected to become a trend in China's northeastern region due to the local governments' support as well as the rich agricultural resources there. Trina installed a demonstration solar farm on rooftops at Shenyang Agricultural University.
- Beijing Development (Hong Kong) announced a joint venture with Beijing Lühaineng Environmental Protection for a CNY1.53 billion waste-to-energy project in Beijing's Haidian district. The two firms will invest in a processing plant with a daily capacity of 2,500 tons. This includes waste incineration amounting to 1,800 tons, and the fermentation of 400 tons of food waste a day. Power generated from the plant will be sold to the power grid at CNY0.65 per kilowatt-hour. It will also collect a waste treatment fee of CNY125 per ton. Beijing Development will have a 99% stake in the joint venture, and Lühaineng 1%.

## POLLUTION

### Drinking water pipelines contaminated with micro-organisms

Large colonies of micro-organisms – some capable of causing serious disease – have been discovered inside pipelines carrying drinking water to homes in most major Chinese cities. Fortunately, most people habitually boil water before drinking, killing off the organisms and reducing the risk of outbreaks, but many foreign visitors often drink from the tap. Senior government officials and water scientists met last year in Beijing to discuss potable water safety, industry insiders say. One possible solution is to launch a national program to replace pipes with high-quality ones, made either of steel or plastic with special coatings. But such an effort would be costly and some experts question whether the central government would

commit to the funding. Water safety has come under scrutiny following a tap water scare in Lanzhou, Gansu province in April. Benzene, which can cause cancer, was discovered in tap water at levels 20 times higher than national limits. An official investigation found that outdated water ducts were to blame and nine officials were disciplined for their role in the incident. Professor Guan Yuntao, associated with a laboratory in Shenzhen under the auspices of Tsinghua University, has been carrying out government-funded research on micro-organism in urban water networks for several decades. The organisms together with organic compounds and heavy metals are the main contributors to unsafe drinking water. In some cities, membranes consisting of a variety of species can form on the inside surface of pipes – much like plaque in human arteries – in a matter of days. The organisms release corrosive waste materials that accelerate the ageing of pipes. Leaks are a common problem and in some cities, up to half the supply is wasted due to problems with the pipe network, the South China Morning Post reported. Replacing Beijing's more than 9,000 km of pipeline would cost more than CNY90 billion. The capital consumed 3.6 billion cubic meters of water last year.

## China's air quality deteriorating

Air quality in May around the country was slightly worse than it was in the same period last year, with air quality in the Yangtze River Delta deteriorating the most, according to the Ministry of Environmental Protection (MEP). The number of days in May with good air quality for the 25 cities in the Yangtze River Delta region was only 18 out of the total of 31 – five days fewer than in May of last year. Of the six major pollutants that are included in the calculation of air quality, only the readings for carbon monoxide were unchanged compared with the 2013 figures for the region. Concentrations of the five others – PM2.5; PM10; sulfur dioxide; nitrogen dioxide; and ozone – all increased. “Stronger sunshine, warmer temperatures and burning straw in the region are the three major reasons for the area's apparently deteriorated air quality,” said an official from the Ministry who requested anonymity. Nanjing, Changzhou and Zhenjiang, all in Jiangsu province in the Yangtze River Delta region, were among the top 10 cities with the worst air quality in May. The 13 cities from the Beijing, Tianjin and Hebei cluster had slightly better air quality in May compared with figures from May last year, with three additional days with good air. The situation for the nine cities from the Pearl River Delta region was virtually unchanged.

## Supreme People's Court launches green tribunal

The Supreme People's Court (SPC) has set up an environment and resources tribunal to hear complex environmental disputes and solve increasingly severe pollution problems. In environmental cases, it can be hard to identify those responsible, damage can have been caused over a long period and both the environment and local residents can be affected. Compared with environment and resources tribunals at the local level, legal experts expect the top court's tribunal to involve different functions, such as providing guidelines to the local tribunals and hearing individual environmental cases. “The most important tasks for this tribunal should be researching and drafting relevant legal explanations, releasing typical case studies and providing instructions to lower-level tribunals on complicated cases,” Wang Mingyuan, Environmental Law Professor at Tsinghua University, said. The number of local environmental courts has reached more than 130 nationwide since 2007. Once the tribunal under the SPC is set up, more environmental tribunals could be introduced at local level. Out of about 11 million lawsuits heard by courts nationwide every year, only 30,000 were related to the environment.

## Drones catch industrial polluters

Aerial drones have uncovered illegal emissions by some of the largest industrial companies in north China. A unit of Hebei Iron & Steel Group, Shanxi Huaze Aluminum & Power; and Inner Mongolia Yihua Chemical were found to have “serious environmental problems”, the Ministry of Environmental Protection said on its website. Data gathered by the drones indicated a quarter of the 254 businesses targeted might be involved in illegal practices. The use of drones to enforce pollution laws followed trial monitoring from November to February in Hebei province. Drones equipped with thermal infrared cameras covered 1,000 square kilometers across the regions of Hebei, Shanxi and Inner Mongolia in the second half of June. The MEP said it would follow up with on-the-ground inspections to ensure companies halted illegal emissions. The use of unmanned aircraft means that companies secretly discharging pollutants at night or at weekends would find no place to hide, Xinhua reported, citing Chen Shanrong, Deputy Director of Environmental Supervision at the Ministry.

## Beijing, Tianjin and Hebei coordinate approaches to smog

The governments of Beijing, Tianjin and Hebei province – known also as Jing-Jin-Ji – agreed on the need to tackle the region's chronic air pollution, but are using different approaches. “Tackling air pollution is a focus of the plan,” said Laurence Brahm, Chief Adviser on environmental economic policy to China's Ministry of Environmental Protection (MEP) under the European Union dialogue program on climate change. After rolling out their own plans to cut emissions, the three local governments also agreed that the solution required a concerted joint approach. A coordinating committee was set up in October to lead the anti-pollution campaign. Co-chaired by a Vice Mayor of Beijing and a Vice Minister of Environmental Protection, the group's main task is to provide joint forecasts on severe smog across the region and coordinate emergency responses when it occurs. Initial results have been promising, as in the first three months of this year, the average concentration of hazardous PM2.5 dropped by 9.5% in 13 cities in the Jing-Jin-Ji area compared to a year earlier. Levels of the larger PM10 dropped by 8.3%. President Xi Jinping “has tried to overcome the persistent barriers to integration and development of Jing-Jin-Ji by pressuring Beijing to outsource its polluting industries, moving some of its population to nearby satellite cities, and by focusing on clean and high value-added sectors,” Hongyi Lai, Professor of Political Economy at the University of Nottingham's School of Contemporary Chinese Studies said. Beijing has long blamed nearby provinces for its worsening smog. According to the capital's environmental bureau, about 25% of air pollution is carried by wind from nearby cities, in particular Baoding, Langfang and Tangshan. Official monitors say the biggest source of Beijing's air pollution still comes from outside the city, beating local vehicle emissions, coal burning and industrial plants combined. Cities in the Beijing-Tianjin-Hebei area have been ordered to cut PM2.5 levels by 25% by 2017 from 2012 levels.

## Beijing officials expect healthy air by 2030

The Chinese capital's fine-particulate pollutant intensity is expected to drop to the internationally recognized safe level of no more than 35 micrograms per cubic meter in 16 years, Pan Tao of the Beijing Municipal Research Institute of Environmental Protection, said. “Improving air quality in the city is not going to be an easy task,” Pan said during the 2014 Beijing International Academic Symposium on Urban Environment in July. The Beijing Environmental Protection Bureau said that the intensity of PM2.5 in 2013 was 89.5 micrograms per cubic meter – still two and a half times above the standard. The Bureau's recently released plan said the intensity of PM2.5 is to be reduced to 60 mg/cu m by 2017, which is still harmful to people's health, but achieving the goal is challenging, Pan said. “The current pollution emission is far beyond the environmental capacity of the city, and any adverse climate condition would easily result in smoggy days,” he added. “The key to current air quality improvement lies in emission reduction.” Many companies in Beijing, especially those with coal-fired boilers and cement plants, have been fined for excessive smoke exhaust, lacking or having faulty emission-monitoring facilities and leaving coal dumps uncovered in the past few months, the Beijing Environmental Protection Bureau said. The amount of sulfur dioxide in Beijing's air has been reduced by 77% since 1998, while nitrogen dioxide has been cut by 30% and PM10 by 42%.

## Pollution from ships and ports targeted

China should establish emissions inventories for all major port cities as soon as possible to detail pollutants from ships and ports, experts have suggested. These pollutants may account for as much as 20% of the cities' airborne pollutants. They have also called for the diesel fuel standard for ships to be strengthened to reduce pollution. Ding Yan, Deputy Director of the Environmental Protection Ministry's vehicle emissions control center, said pollutants generated by ships and the port in Hong Kong contributed more than 50% of the region's airborne pollution. “The proportion for some major port cities in China can reach as high as 20% to 30%,” Ding said at a seminar of the Natural Resources Defense Council, an international non-profit environmental organization. A white paper from the organization on the prevention and control of shipping and port air emissions said pollutants generated by ships and ports include PM2.5, PM10, nitrogen oxide and volatile organic compounds (VOCs). The white paper said the amount of PM2.5 emitted by a medium-sized container ship in one day is equivalent to that emitted by 500,000 cars running on diesel. It said 70% of the pollutants are discharged within 400 km of coastlines and can reach up to 2,500 km inland. “China is home to seven of the 10 busiest container ports in the world. The country's major port cities are also some of the most densely populated cities in the world, posing an even higher risk to public health,” David Pettit, Senior Attorney at the Council, said. He recommended that the central government set up a

detailed emissions inventory for each major port city, the South China Morning Post reports.

## Study suggests halving Pearl River Delta traffic

Reducing traffic in the Pearl River Delta by half could be one of the most effective means of combatting regional smog, according to a cross-border air pollution study. The study highlighted traffic as the major source of a smog-inducing pollutant, volatile organic compounds (VOCs), which can react with nitrogen oxides (NOx) generated from other combustion sources to form ozone. It concluded traffic-related emissions accounted for 50% of the ambient VOC levels in the region, with petrol exhausts being the biggest single contributor. This conclusion was based on modeling results. The summary of the HKD10 million study on the formation of photochemical smog in the region did not elaborate on how traffic could be halved. It was funded by Hong Kong's Environmental Protection Department. The summary also reported that the share of industrial emissions was about 25%.

## City in Guizhou still suffering from mercury pollution

Thirteen years after Asia's largest mercury mine closed, people living in China's "mercury capital" in Guizhou province are still suffering from its legacy. Mining in Wanshan district in Tongren city started 600 years ago, when China's emperors believed mercury was a vital element of the elixir of life. After the founding of the People's Republic of China in 1949, the government established the Guizhou Mercury Mine Group and began large-scale mining. Reckless mining led to its depletion and closure in 2001. Many unemployed workers could not find another job and some died from silicosis or from mercury poisoning. Mercury production has also polluted the local water and soil. Nearly 6,700 hectares of land in Wanshan have been polluted by mercury residue. The Wanshan government has applied to the Ministry of Environmental Protection (MEP) for CNY2 billion to decontaminate 292 hectares of polluted soil, but no decision yet been made.

## Beijing to impose pollution fees on VOCs

Beijing became the first Chinese city to impose pollution fees on a new group of airborne pollutants—volatile organic compounds (VOC). "The estimated amount of fees to be collected annually is between CNY1 billion and CNY2 billion, about half of which may come from southwest Beijing's Fangshan district, where the city's biggest VOC emitter, Sinopec Beijing Yanshan Co, is located," said Wang Hailin, Researcher at the Beijing Research Institute of Environmental Protection. Currently, pollution fees are charged for more than 40 types of airborne pollutants, including sulfur dioxide, nitrogen oxide and carbon monoxide. VOCs are mainly generated by the petrochemical industry, organic chemical industry, during the production of plastic products, and in the packaging and printing industry. It enhances the oxidation of the atmosphere, which facilitates the forming of more pollutants, and is also a premise for the formation of PM2.5. "China has the largest VOC emissions in the world, and they are also growing quickly," said Yang Jintian, Dean of the Atmospheric Environment Institute at the Chinese Academy for Environmental Planning. He said there is no official data for the exact amount of VOC emissions, but they are estimated at about 25 million metric tons a year.

- A chemical plant in Hunan province was shut down in June on suspicion of being linked to the lead poisoning of more than 300 local children. Meilun Chemical Materials is suspected of discharging untreated water and waste. A report by China Central Television (CCTV) said that blood tests on more than 300 children in Dapu township of Hengdong county found excessive levels of lead since 2012, indicating heavy metal poisoning. The lead densities were as high as 501 micrograms per liter, far above the national standard of 100 mg per l.
- The Chinese government's policies to combat water pollution have changed from simply focusing on the polluted water bodies to managing the ecological system of entire river basins. "The coming water pollution prevention and control action plan to be released by the State Council will take into consideration the ecological conservation that involves mountains, waters, woods, lands and lakes within the river basin when treating pollution of a river," said Wang Qian, an official from the Pollution Prevention and Control Department of the Ministry of Environmental Protection (MEP).

- Polluters in Shanghai face harsher penalties under a draft amendment of an air pollution prevention law reviewed by the city legislature. Anyone found guilty of discharging major air pollutants without a license faces a fine of up to CNY500,000, compared to the current CNY100,000. The minimum fine will also be raised to CNY50,000, from CNY10,000 at present. Current fines are too low to act as a deterrent, Shanghai lawmakers said. In addition to other penalties, companies guilty of violations will be charged higher electricity prices until they take action.
- Construction work has completed on China's largest sewage pipeline in Shanghai. The CNY3.7 billion pipeline was built for the state-owned operator, Shanghai Sewerage Co. The pipeline, in the Pudong New Area's Chuansha area, will deal with downtown sewage and also serve the Shanghai Disney Resort currently under construction. The new pipes, which are 4 meters in diameter, can transport up to 2.2 million cubic meters a day. Existing pipelines connecting to the Bailonggang Sewage Plant are unable to deal with the rising volume.
- Beijing's urban planning authorities are for the first time seriously considering creating "wind pathways" in the capital in the future to combat severe air pollution. The concept entails designing sections of the city in a way that allows wind to flow more freely, in the belief this will help disperse air pollutants. "This is not a new concept, but it is given more weight in a new plan," Shao Min, Deputy Director of the College of Environmental Sciences and Engineering at Peking University, told the South China Morning Post. Under the wind pathways framework certain quarters of the city must be reserved for greenery and ecological parks. Some buildings' height would also be restricted.
- Beijing experienced some of the worst smog in months in July, which was blamed on a trough of low pressure hanging over Beijing. The air quality index (AQI) exceeded the 300 level, which is considered hazardous. The Beijing authorities warned residents to avoid strenuous outdoor activities and advised that children, the elderly and the sick remain indoors. Many who did venture outside wore face masks.
- Chengdu-based Pinguo has launched a camera-app for smartphones, Camera 360, which uses a series of digital filters called "Magic Sky" to eliminate the effects of smog from photos. "Magic Sky" offers seven filters to help to turn the sky blue, Pinguo said on its website. Another photo editing app, MeituPic, has also released a new "clear fog" feature designed to sharpen pictures.
- The Beijing Environmental Protection Bureau has imposed record fines of up to CNY26.17 million in the first half of the year, targeting coal-fired boilers with excessive smoke exhaust and other polluting industries, including cement and steel plants that lack emission-monitoring facilities. It has also conducted a crackdown on outdoor barbecues and construction sites that leave dumps uncovered, with a penalty of more than CNY7.5 million. The major pollutants that are monitored were reduced □ sulfur dioxide by 7.25%; nitric oxide by 6.29%; chemical oxygen demand (COD) by 4.30%; and ammonia nitrogen by 3.80% □ from 2012 to 2013.
- Ahead of the the 2014 Summer Youth Olympic Games in August, Nanjing closed about 30 polluting factories to improve air quality. "The environment is one of the most important issues and deserves to be given top priority. It is important to guarantee air quality during the Games. It is also important after the Games," Nanjing Mayor Miu Ruilin said. All construction sites were also ordered to stop work; and open space barbecue restaurants were closed. Three new subway lines were put into service just before the Games to reduce the number of cars on the road.
- More than 1 million syringes are used by Shanghai residents every day at home yet these hazardous items are simply discarded with domestic waste, experts said. Shanghai's medical authorities should set up convenient collection points, said Shi Lili, an official with the state-owned Sinopharm Group, China's biggest pharmaceutical company. Syringes could then be sent for incineration with medical waste from hospitals. Most of the syringes and needles are used by Shanghai's 1.8 million diabetics. Some syringes are even illegally recycled for their plastic parts.
- IBM has signed a contract with the Beijing municipal government to determine the basic elements of emissions to help predict air quality. "By applying supercomputing processing power, scientists from IBM and the Beijing government aim to create visual maps showing the sources and dispersions of pollutants across Beijing 72 hours in advance with street-scale resolution. This capability does not exist today," Steve Tomasco, IBM Research's Director of Communications, told the China Daily. The

system could suggest preventive measures to keep the city's air quality from approaching hazardous levels.

- Authorities in Beijing in August began to enforce the use of cleaner low-sulfur coal. At the end of last year, authorities unveiled plans to slash coal consumption and close polluting mills, factories and smelters to cut air pollution. Beijing has also pushed steelmakers and power plants to buy higher-quality raw materials to meet tougher pollution targets.
- Government agencies in China will be required to purchase more “green” cars. Under a plan drawn up by five central government ministries and departments, at least 30% of all cars purchased for official use in the 2014-16 period must be new-energy. After 2016, the requirement will be increased year by year. New-energy vehicles include electric, plug-in hybrids, fuel-cell and solar-powered models. The central government has promised to subsidize all purchases of new-energy vehicles costing less than CNY180,000. From September 1 through 2017, buyers of new-energy cars are also exempt from the 10% purchase tax.
- Two three-year old Hong Kong-funded air pollution studies on the Pearl River Delta region have not been fully disclosed to the public because Guangdong authorities objected to releasing “confidential information” in them, the Hong Kong government has admitted. Costing HKD10 million each, both studies were completed and filed to the commissioning body, the Environmental Protection Department, in June 2011. Only summary reports have been released.
- China Huaneng Group Corp, the biggest power generation company in the country, said it will invest about CNY10 billion this year to upgrade emissions-control equipment to meet the government's requirement. By the end of this year, all coal-fired power plants of Huaneng Group will be equipped with desulfurization and dust removal equipment. For the 2011-2014 period, the company will spend more than CNY20 billion. The Huaneng Beijing Thermal Power Plant will reach near-zero emissions by the end of 2015.
- The Coca-Cola Co is providing its employees in China with a smog-related bonus as part of its efforts to attract and retain talent. The premium that was recently introduced is believed to be as high as 15% of an employee's base salary. The company refused to provide further details. Panasonic in March also announced it would give an environmental allowance.
- Ozone pollution is at its worst in nearly a decade in Hong Kong, indicating deteriorating regional air quality, according to the Clean Air Network. This was despite a slight improvement in levels of nitrogen dioxide, sulphur dioxide and particulate matter in the first six months of the year compared with the same period last year. Ozone levels were nearly double World Health Organization (WTO) guidelines at all 15 of the city's air quality monitoring stations. The figure has been rising since 2005.
- Bonfires and straw burning are being banned in Shanghai under what an official has called “China's strictest air protection law.” The new legislation, to be introduced on October 1, aims to tackle pollution caused by burning items such as leaves, straw, plastics, rubber and tar. Around 10% of Shanghai's pollution is said to be caused by straw burning in the city's suburban areas. Anyone found burning materials on bonfires will face a fine of up to CNY20,000 under the law. Farmers burning straw will be fined CNY200.
- Beijing will push out industries that generate high levels of pollution and consume a lot of energy and water in order to make room for cleaner, high-tech sectors, Beijing Mayor Wang Anshun, said. The Chinese capital will eliminate about 300 heavy-polluting enterprises within the year and transfer out of the city manufacturing industries that attract a large transient population, consume lots of resources and have lost their competitive edge. Water scarcity has always been a problem for Beijing's development and has reached a critical level as a result of rapid economic growth.
- Beijing will ban the consumption of high-polluting fuels in downtown areas by 2020, the Municipal Environmental Protection Bureau said. The Economic and Technological Development Zone in Yizhuang, Daxing district, will be the first area with zero consumption of high-polluting fuels by the end of this year, according to a new plan. Fuels for use in vehicles are not included on the list of those that will be forbidden. The plan classifies such fuels as coal, fuel oil, petroleum coke, combustible waste, biomass fuels and other fuels defined under national regulations as highly polluting. Those fuels would not be allowed to be used for production, heating or

cooking.

- Beijing kept 70% of its government cars off the roads for 16 days in August to cut smog and ease traffic during high-level meetings ahead of the APEC summit in November. A notice also urged Beijing residents to take public transport, cycle or walk instead of taking cars. Beijing, the country's seat of power, had an estimated 62,026 official cars for its municipal departments and state-owned enterprises, as of the latest official figure from 2011.
- China is considering revising its 20-year-old standards for groundwater and will launch a new network to monitor quality in three years, according to an official with the Ministry of Land and Resources. The nation is facing a worsening crisis over its groundwater as cities and farms in the arid north are forced to rely heavily on drawing water from underground. By the end of last year, only 1.1 million square kilometers, or about 11% of the national territory, was being monitored for groundwater quality.
- Only nine of 161 Chinese cities reached the new – and stricter – air quality monitoring standards in the first half of the year, according to the Ministry of Environmental Protection (MEP). The six were Zhoushan, Shenzhen, Zhuhai, Zhanjiang, Yunfu, Beihai, Sanya and Lhasa. The Ministry ranks and publishes the air quality indices of 74 major cities on a monthly basis.
- Beijing cut coal consumption by 7% in the first half of 2014 as part of its efforts to tackle smog. To reduce coal consumption, it is in the process of shutting down all of its aging coal-fired power plants and replacing them with cleaner natural gas-fired capacity or with power delivered via the grid. Based on last year's coal consumption level of 19 million metric tons, the 7% cut would amount to around 1.33 million tons per year. Beijing has said previously that it plans to reduce total coal use by 2.6 million tons in 2014, and aims to slash consumption to less than 10 million tons per year by 2017.
- Once one of China's most polluted cities, the northwest city of Lanzhou has rid itself of heavy air pollution and became a model for pollution control over the past two years. The city in the Yellow River valley is surrounded by mountains, which hinders the dispersal of pollutants. There were more than 1,000 coal-fired heating boilers, three large thermal power plants and about 200,000 civil small boilers in the city's urban area, but in the past two years Lanzhou has encouraged the use of gas rather than coal for heating.
- Shanghai saw a 10% fall in the level of PM2.5 pollutant particles in the first seven months of this year, compared to the same period in 2013. However, this figure was still 60% higher than the national standard. The average level of PM2.5 particles was 56 micrograms per cubic meter between January and July, said the Environmental Protection Bureau.
- Tianjin blames dust pollution as the main cause of smog. The city is the second one to release an analysis of its PM 2.5 pollution. About 30% of the air pollutants in Tianjin was dust. Coal burning, motor vehicle exhausts and industrial production accounted for 27%, 20% and 17% respectively. In Beijing, PM 2.5 was caused mainly by motor vehicle exhausts, followed by coal burning, industrial production and dust.
- Hong Kong has been hit by the worst six months of red tides in 26 years, with the highest number of potentially harmful algae species recorded. Scientific experts said the algal blooms might indicate that pollution is increasing and climate patterns shifting. They would not rule out the possibility that a lethal red tide could strike soon, although these are almost impossible to forecast.
- The Chinese cities of Hangzhou and Wuhan are the global leaders in bike sharing to reduce car use and pollution. In seven years, China went from no public bikes to 650,000. This year China overtook Italy as the nation with the most programs.
- Logistics companies will from October 1 be prohibited from using trucks that fail to meet Shanghai's strict vehicle emission standards. The new ruling is seen as a move to speed up the complete elimination of so-called yellow label vehicles, which are responsible for much of the air pollution generated by traffic.
- Five years after going to court, 394 residents of Qingpuling village in Fujian province finally won a lawsuit against Fujian Solid Waste Disposal Co, which was found to emit cancer-causing dioxins. The company was ordered to pay nearly CNY6 million to the villagers for causing damage to their health and the eco-system.

- Two companies have been punished for dumping rubbish on land near Hangzhou Bay in Zhejiang province, and staff from both firms are helping police with an ongoing investigation. Construction waste, household garbage and textile waste has now been cleared from a 400-square-meter area of land waiting to be developed. An initial investigation found that the Huilong textile plant had asked the Chenhui property management company in Cixi city to handle its waste products and they had been dumped on the undeveloped land without authorization.
- Authorities in Inner Mongolia are investigating reports that illegal industrial waste water is once again being discharged into the southern Tengger Desert. Experts fear the pollution could permanently damage groundwater sources. In a similar case two years ago, several waste water ponds were discovered and factories also buried industrial waste in the sands. The local groundwater level has dropped more than 40 meters over the past few years.

## GREENHOUSE GAS EMISSIONS

### Polluting companies ignore carbon scheme deadline

More than a quarter of all companies covered by Beijing's municipal carbon laws ignored a key reporting deadline, with some powerful companies questioning the local government trading body's authority to regulate them. Beijing's carbon trading market, one of six set up in China to rein in rapidly growing greenhouse gas emissions, caps carbon dioxide from nearly 500 local enterprises. Most of them must hand over permits to the government to cover for their emissions, while some must only report their CO<sub>2</sub> levels. But 140 of them missed an April deadline to submit a verified report of their 2013 emissions, a key to determining how many permits each firm must hand over to the government to cover for CO<sub>2</sub> output. Some of the firms implied that Beijing's Development and Reform Commission (DRC), which operates the scheme, did not have the authority to issue such orders. Companies said they were waiting for a "red-header document" used for orders issued by the highest levels of government, whose name would be printed in red on the letterhead. For example, the Chief Executive of the China Railway Corp, one of the companies supposed to submit the report, is higher in rank than the Director of the Beijing DRC. State-owned enterprises (SOEs) routinely ignore environmental regulations issued by local governments, one of the main reasons why China is struggling to cut soaring pollution levels despite issuing a raft of environmental policies in the last couple of years.

### Emission markets still to be improved

The number of carbon permits traded on China's pilot emissions market in Shenzhen reached 1.57 million in its first year of operations, or about 5% of the total offered for last year. Shenzhen was the first of seven pilot schemes set up by the authorities, with the final one launched in Chongqing, in a bid to curb its greenhouse gas emissions. For all the seven pilot carbon markets, liquidity has been a problem, with the firms covered by the schemes given little incentive to trade large volumes in the first year. While the market has provided valuable experience for policymakers eyeing a nationwide trading platform, improvements were still required, said Ge Xing'an, Vice Director at the China Emissions Exchange, which runs the Shenzhen market. It caps emissions from 635 firms, some of which had not participated initially, saying they were unhappy about scheme rules and planned to appeal to the government about how their emission targets had been set. On an average, less than 1,500 permits were traded per day before May, but this later exceeded 20,000 tons a day after the city government made it clear that it would fine companies that failed to comply. At the end of the first year, 96% of the companies covered by the scheme had met their targets and the price for permits stood at CNY65 per ton, compared with CNY30 last year.

### China and U.S. collaborate on new energy and carbon capture

China and the United States have reached agreement on a series of partnership projects, ranging from clean coal power generation technology to carbon capture and storage, on the eve of the sixth U.S.-China Strategic and Economic Dialogue (SED). The U.S.-China Climate Change Working Group has mobilized resources to realize eight projects, including collaboration on clean coal power generation technology by the Huaneng Clean Energy Research Institute and Summit Power Group; and Northern Shaanxi industrialized demonstration of ultra-cleaning technology by Yanchang Petroleum Corp, Air Products and

Chemicals and West Virginia University. A special session on climate change was also held during the SED in July. Six new eco-partnerships have been chosen for this year, including ones between the Shanghai Municipal Transportation Commission and the Port of Los Angeles, the Tianjin Economic Technological Development Area and the Commerce Department of Philadelphia, and the Shenzhen Low-carbon Development Foundation and the Environmental Defense Fund. U.S. Under Secretary of State Catherine Novelli said the initiatives have integrated governments, academia, civil society and the private sectors from both sides to address climate change and air pollution. Altogether 30 partnerships have been selected to date.

## Foreigners allowed to trade carbon permits in Shenzhen

China will allow foreigners to trade carbon permits in Shenzhen, making it the nation's first emissions exchange to welcome foreign investors. The Shenzhen exchange has yet to set the date or finalize other entry procedures. Foreign investors are expected to bring more experience to the market. The China Emissions Exchange in Shenzhen has granted a trading license to Singapore-based broker Ginga Petroleum, with an additional eight foreign utilities and trading companies waiting in line. Ginga bought 10,000 emission permits in a private deal settled in euros at an undisclosed price. The Shenzhen market, covering about 33 million tons of carbon dioxide per year, is tiny compared to the world's largest – the European Union emissions trading system, which regulates more than two billion tons. But a China-wide market, when fully developed, would dwarf the European scheme, and some foreign carbon traders are eager to get an early foothold in the market.

- Finnish carbon trading firm Greenstream has been granted licenses to operate in three of China's seven pilot emissions schemes, making it the second foreign company to gain entry to what might become the world's largest carbon market. "The licenses give us a right to trade Chinese Certified Emissions Reductions (CCERs) and also Chinese allowances in the pilot schemes on the exchanges," Greenstream Chief Executive Jussi Nykanen said. Greenstream will also seek to invest in projects that can generate CCERs, which are offset credits.
- The Beijing city government will add 120 companies to its emissions trading scheme from 2014. The Beijing scheme was launched last year, covering 490 companies in the power, heating and manufacturing sectors, as well as some public buildings. Beijing MTR Corp, which runs the Beijing subway, and Beijing Capital International Airport Co, are among the new scheme participants.



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