Air Pollution as a Problem among International Cities in Growth: The Economist and Its Coverage of Beijing Smog (2008-2021)

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Abstract: *This paper uses Corpus Assisted Discourse Analysis to trace the coverage of Beijing Haze in the Economist. Though an in-depth investigation of 2008-2021 reports, the researchers find that The Economist has constructed a comparative framework for Global Urban Haze control, actively reported and affirmed Beijing's haze control, and summarized Beijing's haze control experience as a "command control model". The relevant reports show that the climate change problem represented by haze has become a common problem for the development of all mankind. Through more than ten years of efforts, Beijing's efforts in combating haze have been recognized by the international community and created a more positive international city image.*

Keywords: *Beijing Haze; Air Pollution; The Economist; Media Discourse*

Introduction

During the 2008 Beijing Olympic Game, four American cyclists landed in Beijing Capital Airport wearing masks, which was considered as an insult to China among the Chinese netizens. The public saw the cyclists' behavior aggressive and offensive to the host country. In those days, the public in China has no idea of 'smog', some Beijing citizen even mistaken 'smog' as sandstorm abused the city previously. In 2008, the Chinese government committed itself to meet three environmental issue standards in the bid for the Olympic Games. Beijing municipal managed to deal with four air pollutant, especially with sulfur dioxide, carbon monoxide and nitrogen dioxide etc. During those days, the benchmarking technology in air quality monitoring is PM 10, which was the most common index employed by the monitoring agencies.

With the worsen of the air quality, in 2012, PM2.5 was adapted in the Chinese Air Quality Monitoring Index. On its debut, there was astonishing results in January 2013: the four haze weather during January that year covered 30 provinces, and Beijing was surrounded with smog all the month with exceptions in only 5 days. It is reported that among the 500 cities in China, only 1% can meet with the air quality standard issued by WHO, among Top 10 most polluted cities in the world, China held 7. Since then, smog had become hot social topic in that year. "Smog" stepped into the daily life of the common: "check with the weather report before going out, make sure whether it is necessary to wear a mask."

On the issue of air pollution, much like the public, the Chinese and Beijing Municipal government also took

it seriously gradually. In 2012, the central government adapted the monitoring standard, strengthened environmental law enforcement, incorporated haze weather into natural disaster notification system; In the 2014 NPC & CPPCC (the two session of China), Premier Li Keqiang "declare war to air pollution". Also in that year, Beijing Municipal Government allocated 760 billion RMB to alleviate air pollution.

Since the adaption of PM2.5 into the Air Quality Monitoring Index in 2012, the Chinese government had endeavored in deal with air pollution. It will be ten years for the coming 2022. During the previous ten years, the air quality in China improved steadily. The efforts of central and Beijing Municipal government were welcomed by the international society. With the Chinese making their effort to "fight for a blue sky", international media began to focus their reports on smog in China.

Being a world-famous British periodical, Economist took this issue as far as the 2008 Olympic Game. During the last ten more years, Economist reported the situation of the smog, the improvement of the weather and the measurement Chinese took. In its reports, the Economist constructed a special frame on the Chinese air pollution: air pollution as a problem among international cities in their growth. Climate change and air pollution as problems confronted by community of common destiny for all mankind.

Literature Review

Research on international report on Beijing somg has been a hot topic among Chinese journalism and communication scholars since 2012. In those days, China's air pollution drew great international attention. Chinese researchers used various methods like content analysis, discourse analysis and context interpretation to expose international media's manipulation and distortion of China's environmental image stemming from factors such as economic, political, foreign relations and ideology considerations. Weizhi Yin (2013) conducted a survey on the reports of international media on Beijing somg. She found that the reports were with sarcastic and extreme words, which was the evidence that international media were "Demonization" in their reports on China; Jilong Wang (2016) focused his research on New York Times. He found that the paper constructed a news frame concentrated on politics and legal, which resulted a weak scientific explanation. 74% reports on the topic of air pollution mentioned China and it was the Chinese government's fault, which was biased.

Years on, more thorough reports were made by international media on this topic. Recently, Chinese researchers began to use more innovative methods and techniques besides content analysis, discourse analysis. The time span of these analysis also extended from short term synchronic type to diachronic analysis, which conducted many thought-provoking discoveries.

Guoming Yu (2017) conducted their research from Beijing's image of international metropolis. Their research sampled with 18 mainstream media in seven western countries. They found that the topic of Beijing's somg had ranked the second among the various themes international media reported on Beijing. How the government to alleviate air pollution, the role government played and the relation between the public with the government were three hot issues international media followed closely. The research also found that, among the seven countries (Britain, US, Australia, Malaysia, Singapore and India Canada), the media in Britain and US reported more on Beijing, Britain media showed more interests than US media towards Beijing. Among the

18 media the research sampled, Economist were one of the two media selected standing for Britain media. The two media selected were Daily Mail and Economist.

Ming Liu (2017) conducted a research on Guardians (Britain) New York Times, Times (US) and China Daily (China) from corpus-assisted discourse study. They took Chinese air pollution reports (mainly Beijing smog reports) of the four papers as sample, consisted two corpus that were Anglo-American news media corpus and China Daily corpus. Using Wordsmith (a computer-assisted corpus analysis tool) and critical discourse analysis, the research done quantitative and qualitative research on these contexts. The scholars found that environment issues had already become the most challenging issue in contemporary China, the environmental communication of air pollution and smog not only affected the social stability of China, but also its global image. Through the comparison, the research found Anglo-American news media corpus mainly constructed a negative image on the Chinese government, which failed to deal with the problem. It was the ideological factor which considered China as an enemy that behind. Western media's purposes were to push Chinese government to amend its environmental policy, pressure the Chinese government to apply the unjustified treaty on climate change.

With the birth of a new mode of news production, news content aggregation production and intelligent distribution through algorithms, and a news aggregation platform emphasizing "technology neutrality" appears. Minghua Xu (2020) studied on the machine algorithm of Google News Platform, through the comparison of smog in China and India presented by Western media, the authors found China's haze issues are presented as "Pan politicized multi-dimensional environmental issues", while India's haze is presented as "Pan socialized single-dimensional environmental issues". The study blended semiotics and fantasy theme analysis method (Ernest Bormann). The researchers found the news on Google News Platform on China smog recounted five types of fantasy: Dense fog diffuse type (the current situation and attribution of China's haze problem), Troublesome type (the state of China's society under the haze problem), High-pressure regulation type (the Chinese government's governance means for haze), Rescue Gospel type (China's haze governance under the concern of the western world) and "Uncertain Future type" (prediction of China's haze impact and development prospect).

Research Design and Basic Data

Data Source and Collection

This study is based on the full-text data of the Economist in ProQuest database. Taking Beijing and haze as keywords, the search year is set as January 1, 2008 to December 31, 2021. 95 related results were obtained. Among them, excluding the reports of "economist online" and Beijing specifically referring to the central government, 30 relevant reports were obtained. These reports become the main content of the Beijing part of this study.

Accessing to the full-text data of the Economist in ProQuest database, with haze as the keyword, the search year sets from January 1, 2008 to December 31, 2021, 318 relevant results are obtained. Excluding the reports of "Economist online", 216 relevant reports were obtained. Then take "air pollution" as the keywords to

narrow the search scope, 66 reports were obtained on global cosmopolitan air pollution from the Economist (including 30 previous reports on Beijing haze). That is, from 2008 to 2021, there were 36 reports on smog in other international cities by the Economist. The cities and countries involved include the United States (Los Angeles, Utah, California and the central three states), London, France, Paris, Poland, the United Arab Emirates, Tehran, Seoul, South Korea, European countries, Mexico City, Brazil, Moscow, Southeast Asian countries, Delhi, India, etc. These articles constitute the text of the Economist's haze as the discourse frame of world cosmopolitan development.



Figure 1. Broken line chart of Beijing haze coverage by the Economist from 2008 to 2021

As quality press, the reports of the Economist are mainly in-depth features. The average length of the 66 reports on cosmopolitan air pollution reaches 971 words / article, with the least 388 words and the longest 3988 words. Due to the magazine's stands, weekly edition and stylistic features, the report of the Economist not only covers the basic information, but also involves deeper contexts such as the analysis of the causes of haze, the social impact of haze, government air pollution control measures and so on.

Corpus Assisted Discourse Analysis

Corpus assisted discourse analysis not only takes the advantages of corpus quantitative analysis, but also has the critical feature of discourse analysis of qualitative research. It is more and more used in the content research of communication (Alexander, 2010; Bevitori, 2010, 2015). Critical discourse analysis interprets the text from three aspects: the social background of language use, the ideology of media as a discourse producer, and the maintenance and transformation of social power relations by discourse (Fairclough, 1995; Fowler, 1991; Van Dijk, 1998).

In this study, the related reports are imported into the corpus analysis software Wordsmith 5.0. Through the comparison with the basic 5 million corpus vocabulary of British National Corpus (BNC), we get the key words of the Economist's reports. On this basis, the key words are restored to the text background to explore the unique framework of the Economist's air pollution reports. Entman (1993) held that by comparing the existence and absence of keywords, we can clearly analyze the composition of news frame. As for news, the keywords can be classified into four types:

1. Problem definition: Keywords concerning the nature of the problem;
2. Cause: keywords suggesting the causes of the problem;
3. Consequence: keywords pointing to the consequences of the problem; and
4. Solution/action: keywords indicating possible solutions/actions to the problem.

Climate change and environmental problems are common problems faced by all mankind. This study compares the air pollution news frame of the Economist on Beijing with that of other international cities, explores the construction of the reporting frame of environmental issues from the perspective of the construction of a community of common destiny for mankind.

Research Findings

Table 1. Key words of air pollution report in the Economist (part)

	Problem	Cause	Consequence	Solution/action
Beijing	pollution	carbon	economic	government
	environmental	coal	WHO	city, municipal
	smog	emission	hazardous	clean/clear
	greenhouse	power	lung	decline
	climate	cars	fury	encouraging
	PM2.5	energy		protection
	choking	chimney burning		cost
	airpocalpyse	pollutant		plant
other international cities	smog/fog	traffic	warming	states
	smoke	ritual	breath	governance
	dirty	awry	WHO	poor
	choking	carbon dioxide	hazardous	suit
		diesel	lung	court
		vehicles	particles	residents
		pollutant	death	

Problem: Air Pollution as a Problem among International Cities in Growth

Beijing Smog was first reported in Economist in 2012. In January that year, Beijing Municipal Government decided to responded to public concerns and announced that it would publish PM2 5 monitoring data. In the Jan 14th and Feb 11th edition, the Economist reported Beijing air pollution successively. In its reports, Economist revealed that: Yet until recently China's authorities have revealed measurements only for PM10. When people realized this, an online revolt broke out. Such was the public pressure that the government caved in and PM2.5 data are now being published for Beijing and a handful of other cities. World Health Organization guidelines suggest that PM2.5 levels above ten micrograms per cubic metre are unsafe. Indeed, much of the country's population endures air so foul that it registers above 30 micrograms per cubic metre. Beijing averages 35. Shandong and Henan top 50. (20120114 Clearing the air?; Chinese air pollution? 20120211 Clearing the air; Pollution in China)

During the last decade, Economist's air pollution reports only followed that of Beijing China, but also extended its coverage around the world. It is a problem global metropolis encountered during their growth. The international cities besieged by smog in its stories were London (5), Paris (3), European countries (6), Poland

(1), Moscow (1), the United States (Los Angeles, Salt Lake City) (8), Seoul (1), Southeast Asian countries (2), Tehran (1), the United Arab Emirates (1), Mexico City (2) and Delhi, India (10). (note: some reports covered a lot of cities, for example, the European smog report would include London and Paris at the same time, so the total number of articles would exceed 36 pieces.)

Table 2. Collocates words of the Economist's report definition

	Beijing		Other global metropolis		Delhi, India	
	Collocates	Frequency	Collocates	Frequency	Collocates	Frequency
1	heavy	54	foggy	23	toxic	17
2	worse	18	thicky	20	unsafe	14
3	serious	18	dense	19	choke	13
4	choking	17	dirty	19	traditional	9
5	hazardous	13	smoky	16	poorly	8
6	airpocalypse	5	airpocalypse	3	noxious	6

Through the comparison of collocates between Beijing and other global metropolis, we can find that Economist use evaluative words more in its reports of Beijing, heavy worse serious. But in its reports of other global cities, foggy thicky are words that describing a weather condition.

Through retrieval of these collocates, the study finds, most of these evaluative words were used in 2012 and 2015, that was the time when Beijing's haze was in the prominent stage and that Beijing issued the first red warning on air pollution. It is worth noting that since then Beijing Haze had become a sign post in Economist's report on air pollutions in global metropolis, mentioned in almost every smog stories thereafter. Through comparison of reports on Beijing and other metropolis, there are 29 out of 36 mentioned Beijing, 114 times that Beijing appeared in the stories. 2015 was the watershed point, when Delhi broke out an even more serious haze. After that time, Delhi substituted for Beijing as benchmark of bad air quality (mentioned 64 times in total 36 stories).

By constructing the text structure topic model of news aggregation on Google news platform, Minghua Xu (2020) found that western media's report of Beijing Somg was aligned with their traditional new frame, making a political interpretation and explanation. However, the news frame on Indian smog were confined to social issues, a news frame "Pan socialized single-dimensional environmental issues" that was social in large unitary environmental issue explaination.

In fact, through comparison between Economist's coverage on Beijing and Delhi, we can find that Economist's news frame on Delhi haze are more diverse in nature: traditional way of life (burning straw), poor administrative efficiency, toxic gas emitted by diesel without desulfurization treatment...

Cause: Multiple Factors that Led to Global Metropolis Haze

Keyword aggregation through Wordsmith helps to summarize Economist's explanation of the causes of global metropolis haze, that are: emission 184, coal 129, cars 87 vehicles 42, traffic 23, carbon 195 besides pollutants 34. Still there were season 9, winter 32, (wind) still 69 and other geographical factors. It is a multi-

ple-factor news frame.

Through a thorough in-depth investigate from context and discourse analysis, we find Economist's explanation of the causes of global metropolis haze are mainly rounded up into two categories: the natural factors and the human factors.

(1) The natural factors resulted to the global metropolis haze. Seasonal factors: in winter and spring when the temperature is higher than the normal season, the static/still air state makes the solid particles in the air accumulate continuously. Geographical factors: cities with high mountains as a barrier and with no wind blowing away the solid particles in the air. In fact, most of the cities confronted with haze are partly for their latitude and landform condition.

London, in its river basin ringed by hills, has always had what the Scots call "dreich"; cold, wet winter mists that in early November (20151107 Grey and dreichy; Foggy days)(Mexico City) The city's site, at an altitude of 2,250 metres and surrounded by mountains, makes that difficult. Solar radiation, more intense at high altitude, encourages the formation of lung-damaging ozone. The mountains trap the gas (20160507 Pollution in Mexico; Blocking traffic); Six of the ten most virtuous metropolitan areas are on the west coast, where Pacific breezes lessen demand for heating and air-conditioning. The worst scores for energy use go to places like Cincinnati and Washington, which have appallingly humid summers and bitter winters. Urban areas in the Midwest receive black marks because so much of their electricity comes from coal (20080531 United States And the winner is...; Carbon emissions); (Northern India is surrounded by the Himalayas, Hindu Kush, Suleiman and Gilbert mountains)(Various pollutants in Delhi, India) All this gets chucked up into the air where, in early November, rising humidity combines with falling temperatures and an almost complete lack of wind to produce a clammy, smelly suspension of ultrafine toxic dust. It hangs over the city like congealed smoke (20171118 under a cloud; Banyan).

Beijing's geography and landform are similar to the above cities. The fetid smog that settled on Beijing in January 2013... For several weeks the air was worse than in an airport smoking lounge. A swathe of warm air in the atmosphere settled over the Chinese capital like a duvet and trapped beneath it pollution from the region's 200 coal-fired power plants and 5m cars. The concentration of particles with a diameter of 2.5 microns or less, hit 900 parts per million--40 times the level the World Health Organization deems safe. You could smell, taste and choke on it (20130810 The East is grey; China and the environment).

(2) The human factors resulted to the global metropolis haze. Excessive human activities are the main cause of haze.

Coal consumption is the main cause of haze solid particles and toxic and harmful components. Coal consumption is the focus of the world climate conference on carbon dioxide and greenhouse gas emissions, it has become the primary cause of concern in the Economist's haze report. The country's energy use is similarly gargantuan. This is in part because, under Mao, the use of energy was recklessly profligate. China's consumption of energy per unit of GDP tripled in 1950-78—an unprecedented "achievement". In the early 1990s, at the start of its period of greatest growth, China was still using 800 tonnes of coal equivalent (tce, a unit of energy) to produce $1m of output, far more than other developing countries. Energy efficiency has since

improved; China used 390tce per $1m in 2009. But that was still more than the global average of 300tce and far more than Germany, which used only 173 tce. Despite a huge hydroelectric program, most of this energy comes from burning coal on a vast scale. China currently burns about half the world's supplies. In 2006 it surpassed America in carbon-dioxide emissions from energy (20130810 The East is grey; China and the environment).

Most of the toxic and harmful gases in cities come from the exhaust emissions after the combustion of petrochemical fuels such as gasoline and diesel. The second source (of pollution in London) is nitrogen dioxide emitted by cars. Heathrow airport has the worst air quality in the suburbs of London. Nitrogen oxide concentrations continue to accumulate and exceed EU standards in some places (20180630 Problem in the air). Poor air quality is a localized problem that can be caused by nearby airports, factories or power plants. But curbing vehicle-use helps in all cities--and traffic is one area in which Britain's generally feeble city mayors have some power (20170211 All choked up; The environment).

India and Southeast Asia have unique characteristics in the human factors of the formation of international urban smog. The haze in Southeast Asian countries is more caused by the opening of mountains and deforestation in Indonesia and Myanmar. The haze in Delhi, India, stems from farming habits. Farmers in northern India have the custom of burning straw and clearing the land for the winter after the autumn harvest every year. The burning straw caused a lot of smoke, which spread south to Delhi (20161112 Worse than Beijing; Pollution in India /20171118 under a cloud; Banyan).

Through the analysis of natural and human factors of the causes of haze, the Economist has constructed a multivariate analysis framework. In this news frame, all the global metropolis has some disadvantages geographically. It is perspective out of professional environmental reporting. The differences are made in the interpretation of human factors. For Beijing's haze, the Economist attributed it more to excessive carbon emissions under the rapid economic development; For London, the magazine has explained smog more as a local and small-scale problem; For India and Southeast Asian countries, the journal is more inclined to attribute the causes of haze to customs. These three different attributions make sense. Ming Liu (2017) held that western media's emphasis of the economic development factor in China's smog cause, including industrial production, coal consumption and use of fossil fuels, constantly exaggerated that China's carbon emissions are about to reach a peak, is to pressure chinses government to set out carbon emission reduction targets as soon as possible and fulfill commitments; The purpose of the explanation framework of local and small-scale problems is to appeal to people to change their living and travel habits; Attributing the causes of haze to customs and culture reveals a kind of helplessness, a kind of "others", which implies their dissatisfaction with other cultural types.

Consequence: Negative Impact of Haze on Public Health

On the consequence haze resulted socially, Economist paid special attention to its negative impact to the city residents. Keyword aggregation are pollution 447, lung 43, cancer 13, health 82, public 71 and resident 30. Combinatorial analysis of health 82 with the cities, we find the coverage volume, Beijing 28, London 23 and Delhi 32.

Historically, smog in Britain triggered a public health crisis, which was analyzed in detail and fully by the Economist. In April 2014, London was shrouded in haze, which was called "Sahara dust" by the media. The nitrogen oxide concentration in Oxford Street has exceeded the standard three times for a long time. In 2013, the nitrogen oxide concentration in this street ranked first in Europe (20150110 The big smoke; Air pollution). Researchers at King's College London have found that a child born in London in 2010 can expect to have his life cut short by nine months as a result of breathing its high levels of PM2.5 (20151205 Choking on it; Air pollution). Air pollution "plagues" Britain, says one UN official. The capital is particularly nasty, and compares poorly with other European cities. On some days last month particulate levels in London were higher even than in Beijing (20170211 All choked up; The environment).

The Economist also quoted the views of Chinese scholars to on the increasingly prominent environmental problems in developing countries caused by the unfair global division of production. Research just published in Nature by Zhang Qiang, of Tsinghua University in Beijing, and an international team including environmental economists, physicists and disease experts, suggests the problem has a global dimension, too. in 2007 more than 3m premature deaths around the world were caused by emissions of fine particulate matter. the team reckon just under an eighth were associated with pollutants released in a part of the world different from that in which the death occurred, thanks to transport of such particles from place to place by the wind. Almost twice as many (22% of the total) were a consequence of goods and services that were produced in one region (often poor) and then exported for consumption in another (20170401 Trading in mortality; Global air pollution).

In terms of the results caused by smog, the Economist is more inclined to report the negative impact of smog on public health. The reports quoted authoritative professional journals and experts to present it objectively. The Economist pioneered the interpretation framework of economic operation with the "Big Mac Index". Here, the Economist pioneered the concept of "two kinds of haze".

The consequences air pollution raised can be divided into two categories: smog can be seen (solid particles in air) and those invisible smog (colorless and odorless toxic gas in the air). Air pollution used to be a visible killer. The "great smog" that accumulated over London in the winter of 1952 was so bad that people had to feel their way home along railings. Thousands died, driving politicians to pass a Clean Air Act in 1956. In the 1970s, acid rain caused by the use of petrochemical fuels caused great damage to the environment. With the progress of environmental technology, although the perceptible haze is gone, the colorless, tasteless and imperceptible toxic components rise instead of falling. The harm caused by invisible air pollution is not immediate, so it has not become a hot political topic (20150110 The big smoke; Air pollution/ 20151205 Choking on it; Air pollution).While focusing on the visible haze, the Economist also focuses on the invisible smog, tracking the impact on public health under the "low pollution" air state of "low in index" but "over concentration" for a long time.

Solution/Action: A Comparative Framework

Under the coverage of Economist, global cities differ in their handling with the air pollution issues. It is a news frame of comparison which the magazine constructed. Keywords extracted from the corpus on the Bei-

jing's endeavor to deal with air pollution were government 98,city 87 (municipal 4, clean 29, clear 21, decline 6, encouraging 7, while states 128, governance 7, poor 24, suit 9 on other cities. Chinese government's high efficiency was praised in Economist's report.The plan seems to be working. The concentration of pollutants with a diameter of 2.5 microns or less (PM 2.5—the most deadly kind) fell from over 100 micrograms per cubic metre in Beijing in 2012-13, at the time of the city's notorious "airpocalypse", to around 75 in 2016. That is comparable to London's clean-up after the "pea soup" fogs of the 1950s, but quicker (20171216 Awry in the sky; Pollution). But at the opening on March 5th of this year's nine-day meeting the prime minister, Li Keqiang, in his maiden speech, deviated at least a little from the usual stodgy fare. China, he said, must "declare war" on pollution. Mr Li also said the amount of energy consumed per unit of GDP growth would be cut this year by 3.9%, after a 3.7% drop last year (2013). Smog notwithstanding, researchers at Harvard University last year said China's cuts in sulphur-dioxide emissions in recent years may have been "one of the most swiftly effective air-pollution policies ever implemented anywhere" (20140308 The smog of war; China's parliament).

Meanwhile Economist concludes that Beijing's mode to deal with air pollution were Command-and-Control Suits (20171216 Awry in the sky; Pollution), which the magazine explained in detail:

(1) Collaborative Cross Regional Effort

In 2015, the reporter of Economist went to Hebei province near Beijing to investigate China's collaborative cross regional effort to fight against smog. The journalist came to Shijing County Baoding, found that Tyre Repair Works were in slump for the dusty rock-mining was closed. Next door a wholesale coal business has closed. So too have a small family-owned barbecue restaurant and an alcohol, tobacco and grocery store. Red characters posted by their entrances still forlornly proclaim their "grand opening". The closures may be having some effect. The environmental ministry reported that in the region encompassing Beijing, Hebei and the city of Tianjin the average level in the air of PM2.5, the smallest measured particles which are most harmful to health, was 93 micrograms per cubic metre last year, down from 106 in 2013. In Beijing itself the level dropped by 4%, to 85.9 micrograms per cubic metre. Dutifully, Hebei, which surrounds Beijing, has been trying to clean up. Since the beginning of 2013 it has reported closing down 18,000 polluting factories. Hebei's economy has suffered. But as China's GDP growth slowed from 7.7% in 2013 to 7.4% last year, Hebei's fell much more sharply, from 8.2% to 6.5%, according to official figures. The slowdown in Hebei's industrial sector last year was particularly severe, from 10% growth in 2013 to just 5.1% last year, compared with a much gentler decline nationwide from 9.7% to 8.3% (20150207 The cost of clean air; Pollution). In 2016, the reporter came to Tangshan also in Hebei province. The city of Tangshan, the source of about one-tenth of China's steel output and (literally) eye-watering levels of pollution. To keep the air clean for the event, the local authorities have sporadically suspended steel production. Their efforts look like a crafty way of disguising the effects of the country's economic slowdown and industrial overcapacity, which have undoubtedly taken a toll on Tangshan's steel industry (20160709 Beijing v belching chimneys; Pollution).

Besides geographical factors, to many cities there are transfer factor for their smog to accumulate. For the metropolis troubled, they can solve their own problems through resource allocation and other means. But smog is an area issue can not be dealt with solely. Collaboration between the cities are difficult. Nowadays, cities can implement harsh environment protection methods, cutting emission and energy consumption, but

when the winds blow, somg comes again. In comparison, Economist's coverage of the US failure on Cross-State Air Pollution Rule is an typical example.

October 11th 2011, no fewer than 36 separate entities--states, cities, power companies, trade associations--had petitioned the United States Court of Appeals for the DC Circuit to review or stop the Environmental Protection Agency (EPA) from implementing the Cross-State Air Pollution Rule (CSAPR). The rule at the centre of this scrum requires power plants in 28 states—everything from Texas eastwards, except Delaware and the six New England states, and including Oklahoma, Nebraska and Kansas—to reduce emissions that contribute to ozone and fine-particle pollution in other states. (Other states' emissions do not have enough of an effect on air-quality in neighbouring states to trigger a reduction.) The rule is scheduled to take effect from January 1st 2012. By 2014 these states' sulphur-dioxide emissions must be 27% of what they were in 2005, while nitrogen-oxide levels must fall to 46% of their 2005 levels. The governors of Georgia and Texas wrote to Obama and resolutely refused to comply because they touched on the interests of the upper states and enterprises. Paradoxically, in 2008, four years ago, 18 downwind states collectively sued the US Environmental Protection Agency under George W. Bush for inaction on carbon dioxide emissions. As it involves partisan disputes and vote contests, the status of the U.S. Environmental Protection Agency is embarrassing. It is difficult to act and not act, "both ends are angry" (20111015 United States Don't hold your breath; Air-quality regulations).

(2) Multiple Measures to Fight against Smog

The Economist built the news frame of China's response to air pollution and Beijing's alleviation of haze under the background of global climate change and China's energy conservation and emission reduction. Its attitudes toward chinses endeavor changed from worries and wait-and-see, expectation and recognition.

Worries and Wait-and-See (China leads the world in coal production and consumption. It mines over 3 billion tonnes of coal a year, three times more than the next-biggest producer (America), and yet last year overtook Japan to become the world's biggest coal importer. Over four-fifths of China's electricity comes from coal-fired power plants. Burning coal is a big cause of the severe air pollution afflicting parts of China, and, through waste from coal-washing and underground leakage, of contaminated water and degraded soil (20120225 Old king coal; Banya). China's greenhouse-gas emissions were about 10% of the world's total in 1990. Now they are nearer 30%. Since 2000 China alone has accounted for two-thirds of the global growth in carbon-dioxide emissions. While America and Europe are cutting their emissions by 60m tonnes a year combined, China is increasing its own by over 500m tonnes (20130810 The East is grey; China and the environment).

Expectation: China has concentrated on reducing carbon intensity--emissions per unit of GDP (see chart 3). This fell by about 20% in the past five years and the government is aiming to cut it by 40-45% by 2020, compared with 2005. According to the World Bank, better operations and the closure of clapped-out plants helped to push the average thermal efficiency of its coal-fired power stations from 31% in 2000 to 37% in 2010; America's remained flat, at 33%. The other big energy change is China's vast renewables program. The government aims to get 20% of its energy from such sources by 2020, the same target as in richer Europe. The largest slice will come from hydropower, which accounted for around 15% of total energy in 2012 (with nuclear power at 2%). But the big rise comes from wind and solar: the government will roughly double in-

vestment in these two in 2011-16, compared with 2006-10. Chinese investment in renewables puts others to shame (20130810 The East is grey; China and the environment).

Recognition: Along with reducing the targets it sets for energy intensity, China is setting up a pilot carbon-trading scheme in seven cities and provinces. Next, it plans to cap the amount of energy consumed, probably at 4 billion tce in 2015. That would require a sharp reduction in energy growth. The third stage is to turn the energy cap into a national emissions target. This is supposed to happen in 2016-20. The aim is to pave the way, in 2021-25, for provincial carbon budgets and a national carbon-trading system (20130810 The East is grey; China and the environment.

(3) The Interplay between the Governments and the Public

According to the reports of the Economist, Beijing's air pollution issue has gone through such a process: public attention, but the Chinese and Beijing governments initially worried about affecting Beijing's international image and "deliberately avoided" relevant issues for maintaining stability, to (the government) accept (the people) supervision and act actively, then there is a consensus between the government and the municipal people under the common goal of controlling haze.

Ma Jun, a prominent environmentalist who heads the Institute of Public and Environmental Affairs, is using the NGO's "Blue Map" app, with the help of real-time data released by the government, to show which industrial complexes are violating air-quality standards. Users can then denounce polluters through social media. This year (2016) the central government launched its first crackdown, sending inspectors to Hebei province, home to Tangshan. Reportedly they closed down 200 companies and ordered the arrest of 123 people, some for allegedly fabricating information about pollution-control measures. On July 5th Hebei responded to the inspectors' criticisms by pledging to "put environmental protection in a more prominent position" The central government has begun to use environmental law as "a stick" to encourage the shift to a service-oriented economy, says Mr Ma (20160709 Beijing v belching chimneys; Pollution).

Conclusion

The Economist opened its China column in Jan 28, 2012 for providing more space for articles about China. It has been 70 years since the magazine set the first special column for the United States in 1942. In 2022 it would be the 10th anniversary of the debut of "China Column". During the past 10 years it increased its coverage of China in the magazine. In 2012, The Economist published over 200 reports about China, three times the volume as compared with 10 years ago. Meanwhile, the content of coverage also has extended from politics and economy to areas like society, culture and science. With the deepening of its China reports, the theme of the reports are becoming more and more diverse, and the perspective of the reports cover more aspects of Chinese society, correspondents, no longer confined in big cities like Beijing and Shanghai, they went to small villages and western provinces, around China.

Through the Corpus Assisted Discourse Analysis, through the analysis of the content and reporting frame of the Economist's coverage on Beijing's air pollution for more than ten years, it is not difficult to find that the

journal is different from many western mainstream media in terms of reporting intention, perspective selection, reporting methods and analysis of haze. It is positive while alternative in nature:

(1) In its coverage, the Economist extends the explanation frame, puts Beijing Smog into the issue global metropolis encounters in their way to develop. It is a worldwide problem not only Beijing endures. Thus the journal holds a universalism position in treating with the air pollution problem.

(2) The Economist uses scientific narrative in its reports. It concentrates that air pollution is a problem of climate change first, then it is a problem countries around world should deal with from political, admirative means. It is different from other media's politicization of the problem in nature.

(3) The Economist's coverage of smog is both diachronic and synchronic. Through comparative between the past (London), now (Beijing) and future (Delhi) and comparative between countries (Britain, China, US etc.) it constructed the Beijing Smog with historical background taking into account other countries and regions in the world. The countries and cities besieged by smog are London, Paris, European countries, Poland, Moscow, the United States (Los Angeles, Salt Lake City), Seoul, Southeast Asian countries, Tehran, the United Arab Emirates, Mexico City and Delhi, India, not only Beijing.

(4) It is from the above three perspective that Economist's attitude towards Beijing's dealing with air pollution is more positive which is different from other international media. In the research on the emotional distribution of China's haze reports from Google News 2011 to 2017, Minghua Xu (2000) found that the ratio of positive emotion index of China's haze text from 0 to 0.31, increasing year by year, the neutral emotion index is gradually increasing from 0.171 to 0.422, and the negative emotion index is decreasing from 0.829 to 0.248 year by year. This shows that China's environmental endeavor has achieved practical results and has been recognized by the international community and international public opinion.

In the process of shaping the city image, the changes of political relations between countries, the geographical factors of the city itself, cultural characteristics, economic development and other factors all play an important role. When the environment problem becomes an issue related to the future development of all mankind, it is natural that Beijing, as the capital of China, becomes the focus of world attention. The Economist's coverage stands for the possibility of the formation of an alternative international public opinion.

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