

POLICY BRIEF

Communication and Awareness Strategies:

Raising awareness about the health impacts of coal in Indonesia – Examples from India and China

April 2019

Introduction

This policy brief showcases examples of successful awareness-raising campaigns on the health impacts of air pollution in countries like China and India, where coal is the main source of electricity. The public outcry in both countries has been drawing their respective governments' attention; in response they have started taking measures to reduce air pollution from the combustion of fossil fuels, in some cases even shutting down coal power plants.

Indonesia produces 60 per cent of its electricity using coal, while still investing in and expanding coal power plants. Also, while the links between poor air quality and transportation sector emissions and smog from deforestation fires are well established in Indonesia, coal is still not seen as a main driver of air pollution. More importantly, the link between several diseases and air pollution is yet not widely understood and recognized in the country.

It is therefore important that the country's citizens be made aware of these links and the health hazards of air pollution. With increased awareness, civil society can better demand actions that prioritize Indonesians' health and well-being. The examples listed in this policy brief should serve as an inspiration and even be replicated in Indonesia, with the hopes of creating a call for action among Indonesian citizens.

India

In India, coal accounts for more than 70 per cent of electricity generation (Vishwanathan, Garg, & Tiwari, 2018). In addition, the country is the second largest coal producer in the world (IEA, 2017). In 2015, the Centre for Science and Environment (CSE) released the first-ever environmental rating of coal-based power plants in India (CSE, 2015). The two-year research study found that coal power plants in India are performing far below global benchmarks. In terms of air pollution, 55 per cent of the units were violating air pollution standards which were already extremely lax. Not coincidentally, according to the WHO, India hosts 9 out of the 10 most polluted cities in



the world (Musaddique, 2018). Those numbers are alarming not only from an environmental perspective but also from that of health: deaths caused by air pollution in India were estimated at 1.2 million in 2017 (Goldhill, 2018). Also, in 2018, an analysis by Greenpeace indicated that around 76,000 premature deaths could be avoided if the emission standards of the Ministry of Environment, Forest and Climate Change in 2015 were implemented on time (Ministry of Environment, Forest and Climate Change, 2015; Myllyvirta & Dahiya, 2018).

The constant decline in air quality and the increasing awareness about the linked health hazards has resulted in the citizens' demands for solutions and government action. A survey done by Shakti Foundation together with Edelman India in 2017 showed that the majority of respondents across different cities claim to be aware of air pollution and to have a general dissatisfaction with government efforts. The impacts of air pollution on health appears to dominate public concern (Shakti Sustainable Energy Foundation & Edelman India, 2017).

In January 2018, the government released a National Clean Air Program (NCAP) that provided guidelines and plans to prevent, control and mitigate air pollution, while also showcasing ongoing government initiatives and promoting the importance of public awareness (Ministry of Environment, Forest and Climate Change, 2019; Jaiswal, 2019). It also proposes a national target of 20 to 30 per cent reduction of PM2.5 and PM10 concentrations by 2024.

Examples of public initiatives to educate about the health effects of air pollution

To showcase examples of public initiatives, an analysis of the Facebook page of the Lung Care Foundation¹ was done, looking for successful content and its approach to awareness raising on pollution and health. The foundation plays an active role in developing actions and campaigns to alert civil society on the dangers of Indian air pollution, in large part thanks to the involvement of its founder, Dr. Arvind Kumar, who is currently the

A major challenge is the lack of awareness. Indians know that pollution is bad for them and their children, but many do not understand the extent to which the damage carries in the body, with brutal effects. This lack of awareness leads to apathy. Thus, doctors must educate patients and not just after they've been diagnosed with a pollution-related disease.

chairman of the Centre for Chest Surgery and director of the Institute of Robotic Surgery at Sir Ganga Ram Hospital in New Delhi. Dr. Kumar actively advocates for better air quality in India, giving interviews and engaging in campaigns, always publicizing the severe negative impacts air pollution has on Indian citizens. Dr. Kumar's didactic approach to explaining the links between air pollution and health helps the general public understand the gravity of the situation and better engage with the topic.²

There are other Facebook pages engaging with the topic of air pollution in the country, such as Let me Breathe, Help Delhi Breathe and Care4Air, which help mobilize and engage with civil society on actions to fight deadly smog while also disseminating information on air pollution across India and solutions implemented to date. These non-profit organizations or social platforms are engaging with the citizens in the following manner:

Dr. Arvind Kumar (Kumar, 2019)

- **Lung Care Foundation (LCF):** As described on its home page (LCF, n.d.), the LCF was established on May 25, 2015 as a not-for-profit organization dedicated to promoting "Lung Health" in India. The LCF is working toward improving the overall lung health of people by educating them about prevalent health

¹ The page can be accessed at <https://www.facebook.com/foundation.lung.care/>

² Dr. Kumar's Facebook page can be accessed at <https://www.facebook.com/thoracic.surgeon.india/>



hazards of air pollution and also by providing state-of-the-art clinical care accessible to all. LCF's website provides access to its most recent campaigns and events as well as information on its activities, some of which are listed in this policy brief.

- **Let Me Breathe:** As described on its Facebook page,³ Let Me Breathe “is a platform that provides space to document and tell stories of living and surviving air pollution in India. These are unbiased stories aimed at helping people make informed decision on the issue.” The platform attempts to make people aware of the increasing air pollution in India and how it affects them, including the actions they can take to contribute to an improvement. To do this, the page shares videos and live sessions promoted in different cities, where discussions take place between experts, policy-makers, scientists, researchers and the general public, fostering communication and conversations about pollution problems in each city. The page has approximately 45,000 followers as of February 22, 2019.
- **Help Delhi Breathe:** Raising awareness and informing civil society about the dangers of air pollution while also fostering action among the general public, Help Delhi Breathe is a campaign formed by “a group of concerned citizens, businesses and organizations working to fight dangerous air pollution and help all residents of Delhi breathe the pure, safe air they deserve,” according to its website.⁴
- **Air Quality in India:** This knowledge platform serves as a means of sharing and disseminating information on the various aspects of air pollution and its consequences for health, environment and economy. The platform facilitates access to a variety of different sources measuring air quality throughout the country, thus providing considerable air quality data. It also contains a section of blog posts, sharing a great deal of information on topics related to air pollution. It is also possible to interact with the platform, sending questions and ideas.⁵

Campaigns

Campaigns Aimed at General Population

- In an initiative of Help Delhi Breathe along with the Lung Care Foundation and Sir Ganga Ram Hospital, a white lung was installed at the prestigious hospital to simulate the consequences of the exposure of a human lung to the pollution in New Delhi. After only 48 hours, the lung had already changed its colour. The initiative was reported across different channels on Facebook (Care4Air, 2019) and also on media (“Delhi pollution,” 2018).

Activities Engaging School-Age Children

- Supported by the Lung Care Foundation, over 5,000 children from more than 35 schools in Delhi-NCR raised awareness about air pollution and health by forming the world's largest human image of an organ: a healthy lung. The record was recognized by Guinness. The video about the campaign had more than 20,000 views on the LCF's Facebook page as of March 25, 2019 (LCF, 2017). The initiative was appreciated by the President of India, Shri Ram Nath Kovind and Prime Minister, Shri Narendra Modi who sent letters congratulating the kids and the organization on the initiative, lauding their engagement with this important topic (“Over 5000 Students Set Guinness World Record,” 2017).
- In November 2017, schoolchildren marched on the streets of New Delhi protesting against air pollution and promoting awareness on the topic. Hundreds of students wearing facemasks carried signs and banners with messages, demanding actions to improve the extremely low air quality in New Delhi (“Delhi students march,” 2017).

Congratulations for organizing the unique initiative in galvanizing the support of the youth and creating awareness on a vital subject which impacts every individual.

Prime Minister Shri Narendra Modi, in a message (“Lung Care Foundation, Petronet,” 2017)

³ The page can be accessed at <https://www.facebook.com/LetMeBreatheIn/>

⁴ The page can be accessed at <https://www.facebook.com/DelhiPollutionSolution/>

⁵ The platform can be accessed at <https://indiaaq.blog/>



Engagement of the Medical Community (“Doctors for Clean Air”)

- The health community in India has been increasingly more engaged in fighting against air pollution while warning the public of the severe damage it has been causing. At the end of 2018, a campaign—Doctors for Clean Air—was launched in which doctors from 12 medical associations, representing more than 150,000 health specialists across India, pledged to advocate for better air quality and publicize the health impacts of air pollution (“Doctors for Clean Air leads,” 2018). The campaign launch was attended by Christiana Figueres, the former UN official responsible for the 2015 Paris Climate Agreement who advocated that air pollution should be treated as a medical emergency.

Specialist Testimonies and Videos for Different Audiences

Short to medium-length videos, with key messages and facts about the links between air pollution and health provided by health specialists have had considerable views and reach. These types of educational videos have proved⁷ very efficient to inform civil society about complex issues, such as the interconnections between low air quality and several diseases, in a way that the general public can easily understand. When uploaded on social media platforms such as Facebook, a good video can be easily shared and spread, having the potential to go viral and reach a very large audience.⁸

Dr. Arvind Kumar has been an avid advocate of air pollution issues in India, participating in several videos and recorded interviews that have reached a significant number of social media users. Table 1 below summarizes these videos, including the main messages communicated.

As care providers who are confronted regularly with rising burden of many diseases resulting from air pollution, doctors have to become energetic advocates for clean air. The medical community is best positioned to communicate the gravity of this public health emergency to the policymakers and the public.

K.S. Reddy, president of the Public Health Foundation of India⁶ (“Doctors join hands,” 2018)

⁶ The Public Health Foundation of India (PHFI) is engaged in setting public health standards, promoting research, advancing technology and strengthening evidence-based public health practice and policy, among other activities. More information can be found at their website <https://phfi.org/>

⁷ Based on GSI’s experience on developing communication campaigns around subsidy reform.

⁸ As a way to deliver the straightforward messages of specialists, besides the video, images with short sentences could be used. The American Lung Association shows in a campaign the strong support of the health and the medical community for clean air and climate-related policies. The campaign can be seen here: https://www.lung.org/local-content/_content-items/our-initiatives/current-initiatives/health-pros-climate-health.html

Table 1. Health Videos of Dr. Arvind Kumar

Platform	Link	Key Messages	Reach
Video interview by WHO at the first Global Conference on Air Pollution and Health, shared in YouTube	https://youtu.be/TWP5gMylw1k	<ul style="list-style-type: none"> • Raises awareness about the incidence of lung cancer in younger patients (30 to 40 years) as well as in non-smokers. • Warns of the effects of air pollution in the whole society and compares breathing air to smoking cigarettes 	The video is 2:19 minutes long and was uploaded on November 12, 2018 on YouTube—it had 2,747 views as of March 25, 2019
TEDx talk	https://www.facebook.com/watch/?v=1780722055387816	<ul style="list-style-type: none"> • Raises awareness about the dangers of air pollution and the importance and urgency of talking about its health effects. • Warns of the incidence of lung cancer in younger and non-smoking patients, comparing his data over a period of 30 years. • Warns of the link between air quality and cigarettes, explaining PM2.5 particles and showing a conversion rate between the concentration of those particles and smoked cigarettes.⁹ • Shows how Indian cities are positioned in world rankings of air pollution. 	The video is 15:08 minutes long and was shared on December 6, 2018 on Dr. Kumar Facebook page. It had about 1,200 views and was shared 33 times as of March 25, 2019.
Video testimony to Let Me Breathe	https://www.facebook.com/watch/?v=622335724827813	<ul style="list-style-type: none"> • Mentions that, on the worst days, Delhi inhabitants can equivalently “smoke” up to 50 cigarettes just by breathing. 	The 4:14-minute video was launched on October 15, 2018, has about 109,000 views and was shared more than 1,900 times as of March 25, 2019.
Video testimony to Let Me Breathe	https://www.facebook.com/foundation.lung.care/videos/300131517255532/	<ul style="list-style-type: none"> • Talks about much broader consequences of air pollution in health, affecting not only the respiratory system. • Explains how fine particulate matter can enter our cardiovascular system, causing several diseases. 	The video is 4:37 minutes long and was shared October 20, 2018 on the Lung Care Foundation Facebook page. It had about 23,000 views as of March 25, 2019.

⁹ Since the majority of the population might not be aware of what PM_{2.5} particles are, one possible effective way of approach is to make the link between the concentrations of those particles in the air to equivalently smoked cigarettes. A study recently made conversion calculations, “translating” air pollution into cigarettes (Muller & Muller, n.d.).



China

In 2016, China was the world's leading producer of coal (IEA, 2017). In addition, more than 70 per cent of China's electricity generation came from coal in 2015 (IEA Statistics, n.d.).

The years of coal expansion in the country came at a high cost: in 2013, it faced what was called an “airpocalypse,” when air quality measurements reached values higher than the 500 upper limit of the Air Quality Index (AQI)¹⁰ (Whelan, n.d.). In February 2014, the levels reached again values considered hazardous for almost a week, far above the recommended by the World Health Organization (WHO) (Whelan, n.d.). Moreover, the WHO estimated that 1.1 million deaths were caused by ambient air pollution in 2016 alone (WHO, n.d.a).

The alarming pollution and the ensuing public outcry have made the government start taking action. Moving rapidly toward renewable sources of energy (Frangoul, 2018), greatly strengthening air pollution standards for coal power plants, vehicles and industry and shutting down the smaller and dirtier coal power plants (Stanway, n.d.) have had results. In August 2018, Beijing had the bluest sky in a decade, with some of the lowest levels of PM_{2.5} since the measurements started in 2008 (“Beijing Enjoys,” 2018).

As a way to fight for better air quality in China, several awareness campaigns were launched by different civil actors. From the production of a famous documentary with millions of viewers to performance artists, Chinese citizens were able to effectively demand for government action, expressing their dissatisfaction with day-to-day poor air conditions. Chinese research and transparency of air quality data have greatly contributed as well to raising awareness among civilians.

Production of a Documentary Film

A Chinese investigative journalist named Chai Jing produced a documentary on air pollution in China, called *Under the Dome*, which featured a year-long investigation on the causes behind China's deadly air quality. The movie had more than a 100 million views in less than 48 hours when it was released online in March 2015 (Hatton, 2015). *Under the Dome* presents a comprehensive view of air pollution in the country, even tackling how lax the environmental laws can be for polluting industries (Ren, 2015).

Not long after its release, perhaps due to the popularity of the documentary, the movie has been removed from online media by the government, even though it had already reached millions of views, creating a huge debate on Chinese social media and leaving millions of Chinese even more aware of the noxious effects of the country's air pollution (Beaumont-Thomas, 2015).

Research on the Impacts of Coal-Based Air Pollution

Research and clear data are essential to inform policy-makers and society about the several impacts of coal in society and environment. Across the years, China has been enjoying from high-quality research on the many detrimental aspects of coal investment, which has allowed the government and policy-makers to be well informed and therefore, start to take actions. Listed in Box 1 at the end of this chapter, some of the studies and reports conducted in the past years.

Ambient Air Quality Data Apps

The great availability of air quality data can help inform citizens of the air pollution level throughout each day. Thanks to the broad network of air quality monitoring devices set by the government, Chinese citizens are able to

¹⁰ The AQI indicates air quality as hazardous above 300. When the AQI hits 500, the concentration of PM_{2.5} particles is approximately 500 µg/m³, which is 20 times higher than WHO recommendations (WHO, 2018). The guideline value for PM_{2.5} concentration: 25 µg/m³. The AQI calculator can be accessed at <https://airnow.gov/index.cfm?action=airnow.calculator>.



quickly access the air quality in various apps and websites. In the Air Quality Index website,¹¹ visitors are able to access the data of more than 200 air quality stations. All this transparency is extremely important to keep the issue of air pollution in the public agenda.

Moreover, in 2015, the Institute of Public and Environmental Affairs (IPE) launched the Blue Map app, which enables users to access local sources of air pollution, air and water quality and inspect emission from 9,000 polluting companies (Qin, 2015). This easy access to information helps the public to become aware of polluting factories in their surroundings and, as a consequence, create public pressure in case emissions' standards are not complied. The app's users created even further public pressure when sharing the data on Weibo—a popular

What we find is that people don't just access the data, they share that on social media. That part is also powerful.

Ma Jun (quoted in McMahan, 2017)

Chinese social media platform—while tagging Chinese agencies responsible for enforcing environmental standards, which made the problem hard for the government to ignore (McMahon, 2017). Moreover, according to Ma Jun, the founder of IPE and its [Blue Map app](#), Chinese citizens consult the app on Beijing's smoggiest days to see where the pollution is coming from (McMahon, 2017).

Campaigns and Public Demonstrations

Even though the use of certain social media, like Facebook and YouTube, is not allowed in China, citizens have found a way to further demonstrate their concerns about the country's air quality through art and creative manifestations on streets. Some examples are:

I want people to see that we cannot avoid or ignore this problem [and] that we must take real action.

Wang Renzheng, known as Nut Brother (Phillips, 2015)

Nut Brother: Smog Bricks

Nut Brother, a Chinese artist, collected dust from Beijing's polluted air with a Hoover for more than 100 days, creates building blocks out of smog. He hopes to raise awareness of the deadly smog that hits the streets of Beijing.

The performance received media coverage nationally and internationally (including in the *Guardian* [Phillips, 2015], *Daily Mail* [Lyme, 2015], *People's Daily* [Chen, 2015], *New York Times* [Buckley & Wu, 2015], and *Quartz* [Huang, 2015]). The important international coverage suggests that this type of action might be more useful for raising international awareness of issues.

Kong Ning

Kong Ning is a Chinese artist and an environmental activist. She has performed several times on the streets, showing her self-created dresses, many raising awareness on air pollution issues.

In December 2015, she performed in the streets wearing a wedding dress made of air pollution masks while appealing to Beijingers to use public transportations instead of private cars (McGurk, 2018).

In another occasion, she performed in the streets of Beijing with a dress representing black granules, again raising awareness of the alarming air pollution.

Face masks on Peking University statues

When the air quality reached again alarming levels on February 2014, a student at Peking University covered statues of past scholars with face masks, as if protecting them from the heavy hazardous smog the country had been facing for several days ("China: Statues get face masks," 2014).

¹¹ The real-time Air Quality Index of China can be accessed at <https://aqicn.org/map/china/#@g/33.3868/103.4912/4z>



Street demonstrations

At the beginning of 2014, the streets of Chongqing saw common citizens and performance artists express their dissatisfaction with air pollution using masks and placards (Xiyun, 2014). Acts like those, however small, can bring air pollution into public discussion, attract the attention of civil society, and foster change in local and national policies by pressuring government to act.

Box 1. Research on coal impacts in Chinese society

China Coal Cap Research project (NRDC, 2016)

Launched by the Natural Resources Defense Council (NRDC) in October 2013, the project brings together several Chinese stakeholders, from think-tanks to industry associations, with the objective of developing a comprehensive roadmap for policy-makers to establish and implement a compulsory coal consumption cap (NRDC, 2016). As part of this initiative, the following studies (among others) were produced:

- Report “Co-benefits of Coal Consumption Cap Targets”: This report provides clear data from a health and environmental perspective on the multiple benefits of implementing a coal cap.
- Report “The True Cost of Coal in 2012”: This report tries to quantify the impact of coal mining, coal use and coal transportation on water, ecology, climate and human health. Several Chinese universities, institutions and research centres worked together to present this report, revealing the hidden costs of coal in Chinese society (NRDC, 2014b).
- Report “Coal Utilization’s Contribution to Air Pollution”: This study quantitatively analyzes the contribution of coal burning and industrial processes tied to coal utilization to Chinese air pollution (NRDC, 2014a).

Health Effects Institute

In August 2016, the institute released Special Report 20, called “Burden of Disease Attributable to Coal-Burning and Other Major Sources of Air Pollution in China” (GBD MAPS Working Group, 2016). The report was produced under the Global Burden of Disease–Major Air Pollution Sources (GDB MAPS) project, an international collaboration between different universities and institutes. The study identifies coal combustion as the major source of air pollution-related health impacts, indicating the urgency for action (GBD MAPS Working Group, 2016).

Lessons for Indonesia

It is estimated that 1.3 million Indonesians died from non-communicable diseases (NCDs) in 2015 alone (World Health Organization, n.d.b). Those diseases, such as cancer and chronic obstructive pulmonary disease, are strongly related to air pollution, which can worsen severely through the country’s heavy reliance on coal (Sanchez & Luan, 2018). The prospects for Indonesians’ health are not good, as coal plants continue expanding in the country. On February 20, 2019 the Ministry of Energy and Mineral Resources issued the 2019–2028 Electricity Procurement Plan (RUPTL), in which coal is projected to account for 54 per cent of electricity production in the country. Moreover, the state-owned company, Perusahaan Listrik Negara (PLN), is acquiring coal mines on the islands of Sumatera and Kalimantan, as it prioritizes the development of mine-mouth coal power plants in areas with significant coal resources (Bernarto, 2019).

On the other hand, renewable energy is projected to reach a minimum of 23 per cent of the country’s energy mix by 2025, even though the share of renewables in past years is minor compared to coal (Bridle et al., 2018).

Even though there is understanding in Indonesia of the ill effects on air quality of exhaust from transportation and smog from deforestation fires, the relation between air pollution and related diseases is not explored in the same



way. Likewise, the health impacts of coal are still not addressed nor widespread among civil society. Informing Indonesians about the dangerous effects coal has on their health may help create a call for action, which may then lead the government to acknowledge the health costs of coal and start shifting to renewable sources of energy more quickly. Indonesia recognizes the right to a healthy environment in legal instruments, and therefore citizens have the right to access clean air (United Nations General Assembly, 2019).

Campaigns like the ones presented in this policy brief might well be replicated in Indonesia. The main learnings that we can extract from them are:

- **The importance of engaging with the health community.** As it is apparent in all the cases, the interests of the health community on fighting air pollution align with those of the environmental sector—and this alignment makes it possible to mobilize the population using clear and accessible information campaigns—both to civil society and policy-makers.
- **Data availability and display.** Having air quality monitoring and data sharing allows citizens to be better informed of air conditions, raising awareness on the importance and relevance of the topic. It also provides consistent sources for research on air pollution. A well-informed society will keep air pollution on the public agenda and pressure policy-makers to take action against sources of pollution.
- **Engagement of research institutions and NGOs.** Clear research and data informs policy makers on the urgent need for action and the consequences of long-term reliance on coal. It helps quantifying the costs – to the economy, environment and society – of coal usage, clarifying the reasons why this polluting fuel must be rapidly phased-out.
- **Clear channels of communication with civil society.** It is extremely important to inform civil society about the impacts of coal in a clear and didactic way, also raising awareness about the several benefits of a phase-out. Informing citizens allows mobilization and discussion among civil actors, fostering the participation from society on the fight for better air quality, which can be decisive for government action.



References

- Beaumont-Thomas, B. (2015) *Smash-hit Chinese pollution doc Under the Dome taken offline by government*. Retrieved from <https://www.theguardian.com/film/2015/mar/09/chinese-pollution-documentary-under-the-dome-taken-offline-government>
- Beijing enjoys the bluest skies in a decade. (August 19, 2018). *Bloomberg News*. Retrieved from <https://www.bloomberg.com/news/articles/2018-08-19/xi-s-clean-energy-drive-paints-bluest-sky-over-beijing-in-decade>
- Bernarto, B. (2019) *Indonesia announces new electricity procurement plan*. Retrieved from <https://www.nortonrosefulbright.com/en-us/knowledge/publications/66c608e1/indonesia-announces-new-electricity-procurement-plan>
- Breathe Life. (2018, December 04). *Doctors for Clean Air leads India's medical community in fight against air pollution*. Retrieved from <http://breathelife2030.org/news/doctors-clean-air-leads-indias-medical-community-fight-air-pollution/>
- Bridle, R., Gass, P., Halimajaya, A., Lontoh, L., McCulloch, N., Petrofsky, E., & Sanchez, L. (2018) *Missing the 23 Per Cent Target: Roadblocks to the development of renewable energy in Indonesia*. Winnipeg: International Institute for Sustainable Development. Retrieved from <https://www.iisd.org/sites/default/files/publications/roadblocks-indonesia-renewable-energy.pdf>
- Buckley, C., & Wu, A. (2015). Amid smog wave, an artist molds a potent symbol of Beijing's pollution. *New York Times*. Retrieved from <https://www.nytimes.com/2015/12/02/world/asia/beijing-smog-air-pollution-artist-brick.html>
- Care4Air. (2019). SHOCKING! Lungs turned grey on the very next day of installation. [Facebook update]. Retrieved from <https://www.facebook.com/vcare4air/photos/a.510536115786424/1142385162601513/?type=3&theater>
- Centre for Science and Environment (CSE). (2015, February 21) *India's first-ever environmental rating of coal-based power plants finds the sector's performance to be way below global benchmarks*. Retrieved from <https://www.cseindia.org/indias-first-ever-environmental-rating-of-coal-based-power-plants-finds-the-sectors-performance-to-be-way-below-global-benchmarks-5685>
- Chen, S. (2015). Man turns Beijing smog into building bricks. *People's Daily*. Retrieved from <http://en.people.cn/n/2015/1201/c90000-8983804.html>
- China: Statues get face masks to battle smog. (2014, February 26). *BBC News*. Retrieved from <https://www.bbc.com/news/blogs-news-from-elsewhere-26353898>
- Delhi pollution: White-coloured artificial lungs put up outside Ganga Ram Hospital turn black within 48 hours! (2018, November 5). *MirrorNow News*. Retrieved from <https://www.timesnownews.com/mirror-now/in-focus/article/delhi-pollution-artificial-lungs-erected-outside-sir-ganga-ram-hospital-turn-black-within-48-hours-aqi-noida-aqi-delhi-today-air-quality-index-delhi/309733>
- Delhi students march in support of 'Right to Breathe' campaign, demand action to reduce pollution levels. (2017, November 15). *FirstPost*. Retrieved from <https://www.firstpost.com/india/delhi-students-march-in-support-of-right-to-breathe-campaign-demand-action-to-reduce-pollution-levels-4211097.html>
- Doctors join hands to advocate for clean air. (2018, December 05). *The Hindu*. Retrieved from <https://www.thehindu.com/news/cities/Delhi/doctors-join-hands-to-advocate-for-clean-air/article25666890.ece>
- Frangoul, A. (2018). *China becomes a 'driving power' for solar energy with \$86.5 billion invested last year*. Retrieved from <https://www.cnbc.com/2018/04/06/china-becomes-a-driving-power-for-solar-energy-with-86-point-5-billion-invested-last-year.html>



- GBD MAPS Working Group. (2016, August). *Group burden of disease attributable to coal-burning and other air pollution sources in China*. Health Effects Institute. Retrieved from <https://www.healtheffects.org/publication/burden-disease-attributable-coal-burning-and-other-air-pollution-sources-china>
- Goldhill, O. (2018). *Air pollution in India caused 1.2 million deaths last year*. Retrieved from <https://qz.com/1489086/air-pollution-in-india-caused-1-2-million-deaths-last-year/>
- Greenstone, M. (2018). Four years after declaring war on pollution, China is winning. *New York Times*. Retrieved from <https://www.nytimes.com/2018/03/12/upshot/china-pollution-environment-longer-lives.html>
- Hatton, C. (2015) *Under the Dome: The smog film taking China by storm*. Retrieved from <https://www.bbc.com/news/blogs-china-blog-31689232>
- Huang, Z. (2015). A Chinese artist vacuumed up Beijing's smog for 100 days and made a brick from what he collected. *Quartz*. Retrieved from <https://qz.com/562319/a-chinese-artist-vacuumed-up-beijings-smog-for-100-days-and-made-a-brick-from-what-he-collected/>
- International Energy Agency (IEA). (n.d.). *Electricity production from coal sources (% of total)*. Retrieved from <https://data.worldbank.org/indicator/EG.ELC.COAL.ZS?locations=CN-IN>
- International Energy Agency. (2017). Key world energy statistics. Retrieved from <http://www.iea.org/publications/freepublications/publication/KeyWorld2017.pdf>
- Jaiswal, A. (2019). *India Launches a National Clean Air Program*. Retrieved from <https://www.nrdc.org/experts/anjali-jaiswal/india-launches-national-clean-air-program>
- Kumar, A. (2019, February 13) *I'm a chest surgeon in India. It's clear that pollution is a health emergency*. The Washington Post. Retrieved from https://www.washingtonpost.com/opinions/2019/02/13/im-chest-surgeon-india-its-clear-that-pollution-is-health-emergency/?utm_term=.55ae0ca9689a
- Lung Care Foundation (LCF). (n.d.). *Home page*. Retrieved from <http://lcf.org.in/>
- Lung Care Foundation. (2017). *Lung Care Foundation & Guinness World Record* [Facebook video]. Retrieved from <https://www.facebook.com/watch/?v=1121694764673014>
- Lung Care Foundation. (2018, November 9). *Effect of six days of air pollution on lungs*. [Facebook update]. Retrieved from <https://www.facebook.com/foundation.lung.care/photos/a.369074629935035/1129551427220681/?type=3&theater>
- Lung Care Foundation, Petronet LNG bag Guinness award for creating largest image of lungs [News release]. (2017, December 23). *Hindu Business Line*. Retrieved from <https://www.thehindubusinessline.com/business-wire/lung-care-foundation-petronet-lng-bag-guinness-award-for-creating-largest-image-of-lungs/article22316943.ece>
- Lyme, C. (2015). China's smog as thick as a brick: Artist turns toxic fumes into a building block after collecting dust from Beijing's polluted air with a Hoover. *Daily Mail*. Retrieved from <https://www.dailymail.co.uk/news/peoplesdaily/article-3340884/China-s-smog-brick-Artist-turns-toxic-fumes-building-block-collecting-dust-Beijing-s-polluted-air-hoover.html>
- McGurk, A. (2017). *5 Chinese "artists" that took on China's air pollution*. Retrieved from <http://www.greenpeace.org/eastasia/news/blog/5-chinese-artivists-that-took-on-chinas-air-p/blog/58468/>
- McMahon, J. (2017) *How an app is stopping pollution In China*. *Forbes*. Retrieved from <https://www.forbes.com/sites/jeffmcmahon/2017/11/17/how-an-app-is-stopping-pollution-in-china/>



- Ministry of Environment, Forest and Climate Change, Government of India. (2015, April). *Notification of emission standards*. Retrieved from <http://envfor.nic.in/sites/default/files/draft%20Notification%20forinviting%20the%20public%20comments%20for%20the%20Coal%20BTPP.pdf>
- Ministry of Environment, Forest and Climate Change, Government of India. (2019). *National Clean Air Programme*. Retrieved from <http://moef.gov.in/wp-content/uploads/2019/03/NCAP-Report-Full.pdf>
- Muller, A. R., Muller, A. E. (n.d.) *Air Pollution and Cigarette Equivalence*. Retrieved from <http://berkeleyearth.org/air-pollution-and-cigarette-equivalence/>
- Musaddique, S. (2018). *Here are the world's 10 most polluted cities – 9 are in India*. CNBC.com. Retrieved from <https://www.cnbc.com/2018/05/03/here-are-the-worlds-10-most-polluted-cities--9-are-in-india.html>
- Myllyvirta, L., Dahiya, S. (2018) *Health and environmental benefits of implementing the emission standards for coal-based TPPs*. Greenpeace India. Retrieved from https://storage.googleapis.com/planet4-india-stateless/2018/12/21b5f97a-health-and-environmental-benefits-of-implementing-emission-standards-for-coal-based-tpps_final.pdf
- Natural Resources Defense Council (NRDC). (2014a). “Coal Utilization’s Contribution to Air Pollution” report released [Press release]. Retrieved from <http://coalcap.nrdc.cn/work/info?id=32&type=2>
- Natural Resources Defense Council (2014b). “The True Cost of Coal in 2012” report released [Press release]. Retrieved from <http://coalcap.nrdc.cn/work/info?id=29&type=2>
- Natural Resources Defense Council. (2016, March 14). *China Coal Cap Research Project*. Retrieved from <https://www.nrdc.org/resources/china-coal-consumption-cap-plan-and-policy-research-project>
- Over 5000 Students Set Guinness World Record By Forming Largest Human Image Of A Lung (2017, December 24). Retrieved from <https://www.outlookindia.com/website/story/over-5000-students-set-guinness-world-record-by-forming-largest-human-image-of-a-/305892>
- Phillips, T. (2015). *China’s vacuum-cleaner artist turning Beijing’s smog into bricks*. Retrieved from <https://www.theguardian.com/world/2015/dec/01/chinese-vacuum-cleaner-artist-turning-beijings-smog-into-bricks#comment-64319254>
- Qin, L. (2015). “Blue Sky” app to get China’s public thinking about solutions to pollution crisis. *ChinaDialogue*. Retrieved from <https://www.chinadialogue.net/article/show/single/en/7870--Blue-Sky-app-to-get-China-s-public-thinking-about-solutions-to-pollution-crisis>
- Ren, Y. (2015). *Under the Dome: will this film be China’s environmental awakening?* Retrieved from <https://www.theguardian.com/commentisfree/2015/mar/05/under-the-dome-china-pollution-chai-jing>
- Sanchez, L., & Luan, B. (2018). *The Health Cost of Coal in Indonesia*. GSI Report. International Institute for Sustainable Development. Retrieved from <https://www.iisd.org/library/health-cost-coal-indonesia>
- Shakti Sustainable Energy Foundation and Edelman India. (2017). *A survey of public awareness, perceptions and attitudes on air quality in urban India*. Retrieved from <https://shaktifoundation.in/wp-content/uploads/2017/12/A-Hazy-View.pdf>
- Stanway, D. (n.d.). Beijing shuts big coal-fired power plant to ease smog. *Scientific American*. Retrieved from <https://www.scientificamerican.com/article/beijing-shuts-big-coal-fired-power-plant-to-ease-smog/>
- United Nations, General Assembly, Report of the Special Rapporteur. (January 8, 2019). Issue of human rights obligations relating to the enjoyment of a safe, clean, healthy and sustainable environment. Retrieved from https://www.ohchr.org/EN/HRBodies/HRC/RegularSessions/Session31/Documents/A%20HRC%2031%2052_E.docx



Vishwanathan, S. S., Garg, A., & Tiwari, V. (2018). *Coal transition in India. Assessing India's energy transition options*. IDDRI and Climate Strategies. Retrieved from <https://www.iddri.org/en/publications-and-events/report/coal-transition-india>

Whelan, L. (2014). *Artists in China strike blows against the smog*. Retrieved from <https://grist.org/climate-energy/artists-in-china-strike-blows-against-the-smog/>

World Health Organization (n.d.a). *Global Health Observatory data repository*. Deaths by country. Retrieved from <http://apps.who.int/gho/data/node.main.BODAMBIENTAIRDTHS?lang=en>

World Health Organization (n.d.b). *Global Health Observatory data repository*. Total NCD Mortality. Data by country. Retrieved from <http://apps.who.int/gho/data/node.main.A860?lang=en>

World Health Organization. (2018). *Ambient (outdoor) air quality and health*. Retrieved from [https://www.who.int/news-room/fact-sheets/detail/ambient-\(outdoor\)-air-quality-and-health](https://www.who.int/news-room/fact-sheets/detail/ambient-(outdoor)-air-quality-and-health)

Xiyun, D. (2014). *Speaking out against air pollution through "smog art."* Retrieved from <https://www.chinadialogue.net/culture/6822-Speaking-out-against-air-pollution-through-smog-art-en>

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