

Airborne: Pollution, Climate Change, and Visions for Sustainability in China



This project takes “air” (空气 *kongqi*) as its focal point of departure. Air carries pollutants and greenhouse gases that impact people’s health and the global climate, and therefore also trigger both fears and new anticipations of the future. Human energy consumption has fuelled an economic growth take-off in country after country since the industrial revolution, and is now at the root of global warming. At the same time, human agency is both a response and the source of solution to this global challenge. *Airborne* studies how people’s experiences and imaginaries of the impact of air pollution transform into new visions of sustainability and creative forms of action in China – the world’s largest energy consuming state. *Airborne* will answer the question of how, and to which extent, communist authorities, scientists, rural/urban inhabitants, and environmental organizations *interact* in responding to the inseparable risks of air pollution in China and global climate change. In three carefully designed interdisciplinary case studies we integrate issues of gender, class, and rural-urban distinctions into the study of air pollution. This will generate new knowledge of how institutions, and people of different gender, and with unequal levels of access to power, wealth and education, react and respond differently to experiences and perceptions of risks of air pollution. The cases require new forms of cooperation across the disciplines of sinology, anthropology, media science, political science, and environmental chemistry:

Case 1: The Interface between Air Pollution Science and People

Case 2: Central PM Pollution Policy Goes Local

Case 3: The Class and Gender of Individual Air Pollution Exposure

Discovering Air Pollution in China

In January 2013, inhabitants of China’s capital Beijing woke up to a thick layer of smog. Scientists announced that air pollution, while not a new phenomenon in China, was now the worst on record with more than 40 times the recommended safety level.¹ At this time, the heavy smog that people experienced in northern cities, combined with the considerable increase of information about the degree and effect of air pollution, prompted unprecedented amount of popular debates about health and environment all over the country. The upsurge in public expressions of environmental fear and political anger coincided with a decade of intensification of government concern both with immediate effects of air pollution, and with its long-term negative effects on climate and economic growth.² The link between air pollution and global climate change has been well established, and the Chinese government acts on the conviction that a successful reduction of emissions will benefit the local environment as well as the world.³

Considering the fact that China under leadership of the Communist Party has celebrated almost

¹ Elman 2005; Elvin 2004, and Elvin and Liu 2007 on China’s early environmental history. E.g. Shapiro 2001 and 2012; Economy 2004; Edmonds 2000; Weller 2006 regarding the period of the People’s Republic.

² On the connection between air pollution and economy in China see Nilsen and Ho 2013.

³ IPCC 2013; Bond et al. 2013. See also Aunan et al. 2006; Qian and Zhu 2001.

unrestricted industrialization and exploitation of natural resources for more than 60 years,⁴ the government's new ambitions in the field of environmental protection are indeed remarkable.⁵ The recent ambitious mitigation targets also resonate well – at least in theory – with how ambient air pollution is now presented as a matter of life and death in popular culture on Chinese internet.⁶ As recent as in 2012, the Chinese authorities actually tried to stop the US embassy from publicizing its Air Quality Index in Beijing. However, at the same time it started to reveal some of its own data on air quality, and decided to include PM_{2.5} (fine particles <2.5 μm in aerodynamic diameter, the component regarded most important for health damage) in the Air Quality Standards and in the monitoring network in Chinese cities. This would hardly have happened had it not been for the active interventions of people on social media, NGOs, and engaged scientists. Since then we have seen an explosion of popular interest in smartphone apps that provide (often conflicting) American and Chinese hourly measurements of the concentration of health inflicting particulate matter.

It is also only since 2012 that polluted air over cities like Beijing has commonly been described as health threatening “smog” (*wumai* 雾霾). Our preliminary electronic search in more than 30,000 Chinese periodicals going back to 1833 has revealed that a Chinese term for smog was introduced in the media in 2004, and that it was only since 2010 that the number of occurrences of the term used in Chinese periodicals started to increase.⁷ By 2013, the concept of *wumai* or smog had become everyday language, and many people today seem to have forgotten that smog, until recently, was mostly perceived as less dangerous “fog” (*wu* 雾).

Nevertheless, awareness of certain forms of air having a negative impact on people's health has a history in China going back at least two thousand years. In pre-modern times humid air and wind (*feng* 风) were considered to be causes of disease.⁸ History literally matters here, because the introduction of modern scientific understandings of air since the mid-19th century has not made local knowledge irrelevant for how people in contemporary times conceive of the relation between nature and health. Today we find trajectories of indigenous understandings of air in widespread practices of medicine, and in popular perceptions about health and environmental impacts of polluted air.⁹

Although popular fears of air pollution in cities have evolved rapidly in recent years, there has not been much concern in media with the socioeconomic inequities in air pollution exposure. It is usually assumed that the air people breathe is the same regardless of social status. Regarding exposure to urban air pollution there is, however, increasing anecdotal evidence that people's capability to protect themselves from air pollution depends on their social background and material welfare: For instance, foreign schools erecting air sealed tents above their yards, or wealthy urbanities buying retreats in China's hinterlands to escape the urban air. Even more important, the burning of biomass and coal for indoor cooking and heating has for centuries been a major pollution source that causes serious health problems to individuals, while also affecting climate change.¹⁰ In spite of China's economic development and a successful campaign in the 1980s to install cleaner stoves in rural homes, more than half of the 1.3 billion Chinese still rely on solid fuels as their main source of household energy. This puts household air pollution (HAP) among the top largest sources of ill health in China, on par with urban air pollution. The more than

⁴ Shapiro 2012; Economy 2004.

⁵ The “Atmospheric Pollution Prevention Action Plan” aims, for instance, at considerable improvement of air quality already by 2017 (The Central People's Government of the People's Republic of China 2013; English summary: http://news.xinhuanet.com/english/china/2013-09/12/c_132715799.htm)

⁶ On environmental activism in China see e.g. Yang 2005; Xie 2009; Sullivan 2009; Sima 2011.

⁷ <http://www.cnbkxy.com> (accessed 17th December 2013)

⁸ See e.g. Nienhauser 1985, 254–255 on how the exiled northern statesman Jia Yi feared that the southern humid air would kill him; Kuriyama 1994 and Hsu 2007 regarding traditional notions of ‘wind’ and ‘air’ in Chinese medicine.

⁹ E.g. Tilt 2010 and 2013; Bunkenborg 2014.

¹⁰ Aunan et al. 2009; The World Bank 2013.

one million premature deaths caused by HAP each year typically occur in the poorest areas of the country, and typically women are more affected than men.¹¹

Thus, in order to understand how some forms of air pollution gain prominence above others in public debates, how political institutions respond to this, and, not the least, how people exposed to health damaging levels of air pollution themselves react to these experiences, we need to integrate issues of class, gender, and rural-urban distinctions in studies of air pollution and climate change. It is the ambition of *Airborne* to do so through our three interdisciplinary case studies. Building on existing research regarding the connection between air pollution in China and global climate change, the inner workings of Chinese politics, the reception of natural sciences in China, and popular perceptions of health and nature, our case studies challenge conventional disciplinary borders by asking questions that can only be answered by crossing them. Thus, we aim at groundbreaking interdisciplinary research that builds on reasonable certainty about the workings of the world, and “explore the manifest uncertainties that are recognizable just beyond the horizons”.¹²

The Theoretical Potential of *Airborne*

Air pollution in China is drawing a lot of attention, partly because of its scale. It has a profound impact on a very large number of individuals, and a potential to transform the world. In this landscape we need to ask how, and with which effect, people of different classes and gender, scientists, and industries, interact with the political authorities to form environmental policies and daily practices related to environmental sustainability. Theories of world environmental risk have argued that anticipations of environmental catastrophes now shape people’s expectations, guide their actions, and become a political force with the potential to transform the world.¹³ How are such changing understandings of nature and its relation to society and individual evolving in China – one of the world’s most rapidly developing countries where indigenous understandings of health and climate continue to inform people’s ways of making sense of pollution?

Authoritarian governments, among them China as a prototype, are often accredited remarkable thrust and effectiveness in implementing environmental policies, and science is seen as a tool of the authoritarian state to legitimize and promote its knowledge system to a largely ignorant population. However, studies that start, for instance, from local experiences of environmentally caused illness suggest that popular understandings of causes and effects of pollution continue to play a crucial role in the everyday lives of Chinese people.¹⁴ Likewise, studies of local governance in China have challenged monolithic perceptions of communist authority, showing how officials at different levels of the administrative hierarchy are subject to very different constraints and incentives, and therefore also respond very differently to centrally decided policies, and to global as well as local pressures.¹⁵ This remains one of the areas where we still need much more empirical research in order to clarify and understand the crucial processes from centrally formulated policies in the field of air pollution and climate change, to local implementations in China.¹⁶

The Chinese government interacts globally with scientists to develop authoritative knowledge about air pollution and its effects on climate change, and to determine how best to meet these risks with new policies. In order to reach their goals China’s policy makers are bound to interact with local levels of the political structure, the industry, and the broader population – be they peasants

¹¹ The World Bank 2013.

¹² Borrowing from Hastrup 2014, loc 202.

¹³ Beck 2009, p. 15; see also Beck 1992.

¹⁴ E.g. Tilt 2013; see also Bunkenborg 2014 about the popularization of the quasi-scientific concept of subhealth.

¹⁵ Ahlers 2014; Schubert and Ahlers 2012.

¹⁶ For some examples of studies of environmental policy making see e.g. Zheng and Kahn 2013; Delman forthcoming; Delman and Odgaard forthcoming; Qian and Zhu 2001; Zhang 1998; Ho 2006; Zhang et al. 2012.

burning coal in their homes, or urban middle class citizens worried about high concentrations of particulate matter in the air. Such interaction between different and changing knowledge systems, between people and institutions with unequal levels of power, is complex in any society; not least so in China.¹⁷ The incidents of high levels of urban air pollution and the subsequent public outcries have suggested that while officials authoritatively formulate ambitious regulations, they are, at the same time and just like officials in democratic societies,¹⁸ often uncertain and vulnerable due to conflicting goals and mandates, and demands from the public.¹⁹

Therefore, through the selected empirical case studies *Airborne* will address the recent theoretical call for a reevaluation of people's environmental experiences and creative interventions combined with an acknowledgement that also environmental science and technology – and we add policy making – are grounded in practices of habitations.²⁰ Scientists are inhabitants too, and inhabitants have formed their knowledge of nature, health and environment over history through experiences and transmitted knowledge. This is clearly the case in China, although we have limited knowledge of how this process has evolved, and how habitant knowledge continues to inform both policy making, interactions with science, and popular demands for environmental action.

With the selected case studies described below, *Airborne* develops a new form of research cooperation that will help close the gap between the *experienced* environment of people's everyday lives, and the *projected* environment of science and policy discourse.²¹ In all our three cases we integrate the perspectives of science, politics, and inhabitants, and place these within the context of China's environmental history. *In sum*, the cases are designed to produce new empirical knowledge of China's path towards sustainability by highlighting the deep conflicts of interests that are vested in this endeavor. This will generate new theoretical understandings of both the limits and possibilities of human creativity in the face of global environmental risks, as experienced within a politically authoritarian state with undisputed importance for global climate change.

Approach – Three Interdisciplinary Cases

Our approach is to organize cooperative data collection and fieldwork, workshops for joint analysis, and finally co-writing of results across disciplines, all within three closely connected in-depth case studies. Each of the cases highlights different key processes of interaction between political authorities, scientists, and the population who respond to air pollution and related risks. The cases require close cooperation between different research methodologies including: historical and political text studies, anthropological fieldwork and interviews, quantitative surveys, media analysis, and measuring, modelling and comparison of individual air pollution exposure in urban versus rural contexts.

Case 1: The Interface between Air Pollution Science and People

Knowledge of air pollution, and assessment of risks related to deteriorating air quality, have been produced and negotiated at the interface between scientists, intellectuals, enterprises, policy makers and inhabitants in China since the middle of the 19th century. At this interface people's imaginaries of the impact of air pollution become visible; and visions of sustainable lifestyles, both in a local environment and globally, are debated and produced. In Case 1, scholars will study these interfaces diachronically and produce the first historical genealogy of Chinese concepts and debates on polluted air, as they have developed in China from pre-modern indigenous conceptions, through the intellectual debates spurred by the introduction of European sciences in the 19th

¹⁷ Hathaway 2013 has studied such interactions from the perspective of globalized environmentalism in rural areas of Yunnan, Southwest China.

¹⁸ See Mathews 2011 who makes this argument regarding Mexico and Italy.

¹⁹ Ahlers 2014.

²⁰ Ingold 2014, loc 6061. See also Hathaway 2013.

²¹ Drawing on Ingold 2014, loc. 6061.

century.

Early encounters between Chinese indigenous perceptions of the natural world and Western science from the late 19th century have been investigated by a number of scholars,²² but so far too little is understood about how modern air science met with traditional Chinese air knowledge from the 1850s;²³ and even less has been published on how indigenous pre-modern Chinese knowledge on air pollution and human health was challenged when modern health science was introduced into China in the latter half of the 19th century.²⁴

The study in Case 1 evolves from the hypothesis that whereas these historical debates of health and environmental causes and effects of air pollution up to the 2000s mainly unfolded in intellectual and popular science journals and relatively closed policy debates, the recent intense upsurge in global and local media and popular concern with air pollution has created – and now further requires – entirely new forms of interactions between policy makers, scientists, industries, and population in China. Therefore, in addition to the production of a genealogy of *kongqi* based on historical text studies, Case 1 will also include a synchronic sub-case of what seems to be an entirely new form of science-population interaction.

We therefore introduce an approach we call “map the app”. We set focus on an interactive app that is currently under development in Zhejiang Province. It is initiated and partly financed by the provincial government that now cooperates with a large local company. The content of the app is developed by scientists, and the dual aim is to spread information to the population while, at the same time, mobilising people and NGOs to add views and information regarding environmental damage “back” to the app. Our mapping of the app will use interviews with investors, developers and users as one of its methodologies, combined with a detailed visual mapping of the complex processes of interaction among different interest groups that led to the development of the app, and that further evolve when the app is promoted through media, and used by people and NGOs. Thus, through the process of mapping the app, both in its initial stages and after its launching, *Airborne* will be able to follow and explore how it is developed, received, negotiated, and eventually adapted to people’s and policy makers’ needs. This approach will show how experiences of air pollution and risks of climate change now have the capacity to generate new forms of science-policy-population interactions, and what these imply.

Scholars working on Case 1: Rune Svarverud, Gao Fangfang, Bryan Tilt, He Yi, Mette Halskov Hansen.

Case 2: Central PM Pollution Policy Goes Local

Closely related to Case 1’s study of scientist and intellectual debates on air pollution, and the recent turn to new forms of interfaces between science, policy, industry and population, Case 2 will focus on policy interactions. The central Chinese government’s design of a new PM_{2.5} policy (formulated in the “Atmospheric Pollution Prevention Action Plan”) is one of several examples of how resolutely the authorities now aim at reducing air pollutants and climate gasses. Our hypothesis is that the centrally announced battle against air pollution now requires highly skillful mediation of various political, social and economic interests, *including* participation of local actors such as NGOs and new media; and that this happens in much more diverse ways than often assumed. Local governments are pressurized, often against their own ambitions, to tackle highly contentious issues and they may act very differently depending on local economy, local leadership, and level of NGO and media engagement.

²² E.g. Needham and Wang 1954; Wright 2000; Elman 2005; Lackner, Amelung and Kurtz (eds.) 2001.

²³ This should, for instance, be further explored through studies of early encounters of the different knowledge systems as expressed in Chinese translations of European books on science and chemistry, e.g. *Bowu xinbian* (1855), *Gewu rumen* (1868), *Gewu tanyuan* (1875-1880), and *Huaxue Chanyuan* (1882), and in China’s first scientific journal *Gezhi huibian* (1876-1892).

²⁴ Shown for instance in publications like *Huaxue weishenglun* (*On Chemical Hygiene*) from 1890.

For the purpose of investigating the complex interactions resulting from this new centrally decided core policy, we turn again to concrete local cases and study the *implementation* of PM_{2.5} reduction measures in two very different cities, Hangzhou (Zhejiang Province) and Tangshan (Hebei Province). Tangshan is one of the most heavily polluted industrial centers of China with enormous economic issues at stake under the new policy framework. Hangzhou, on the other hand, is polluted but also popularly regarded as a socio-economically well-developed model embodiment of Chinese cultural and ecologic civilization, with an energetic civil society landscape.

In these two locations different angles of the implementation process will be analyzed in a comparative approach that will reveal how nationally and globally prioritized policy measures are shaped, sometimes even remade, by local contexts and demands. In each site we follow how the new PM_{2.5} policy is received, concretized and executed by local political leaders and involved government units, and we analyze their interactions with local industries, societal organizations and the public. Methodologies will include in-depth interviews with implementers and addressees of the local PM_{2.5} policy, the study of policy documents, an analysis of conventional and social media in the two sites, project site visits, and exchange with local experts and NGOs on the subject. Project participants (especially Wang Shuxiao and Kristin Aunan) have long experience in studying local implementation of national air pollution policies in China from a natural science perspective.²⁵

Thus, through cooperation the team will be able to examine how the new PM_{2.5} policy framework complements or overrules existing local approaches, and, most importantly, how the various parties, cleavages and conflicts are addressed and/or included in what then materializes as the ultimate PM_{2.5} policy “on the ground”.

Scholars working on Case 2: Anna Ahlers, Wang Shuxiao, Li Hongtao, Postdoctoral researcher.

Case 3: The Class and Gender of Individual Air Pollution Exposure

Closely related to the research of Case 1 with its main focus on science, and Case 2 with its main focus on politics, Case 3 explores how gender and social class may determine critical differences not only in actual levels of exposure to air pollutants, but also in people’s ways of making sense of and reacting to pollution. There has been an explosion in news and media debates regarding ambient air pollution in Chinese cities. However, the topic of household air pollution in poor rural areas remains practically invisible in both Chinese and global media, and China’s official air policy.

This suggests that not merely science, but also gender and social class are key constituents in the processes by which some forms of pollution get prominence above others in public debates and in policy making. In order to understand the significance of gender and social class in the context of air pollution science and politics, scholars with competence in air pollution chemistry and health effects, anthropology, and media science will work closely together to collect comparative data from one polluted urban city, and one rural village. The hypothesis is that especially rural women in poorer areas may be exposed to more health damaging air pollutants due to household cooking than the urban middle class in polluted cities; and that gender, power, and educational hierarchies, combined with media influence, account for crucial disparities in how different kinds of air pollution are treated by policy makers, in public debates, and even in household negotiations of economic investments.

Concretely, the team will assess and compare daily life exposure to air pollution among a sample of rural inhabitants using biomass and coal for indoor cooking, and a sample of middle class urban

²⁵ Zhang et al. 2012.

inhabitants exposed to high levels of ambient air pollution. On the basis of this assessment, we investigate how adult inhabitants of different gender and social class anticipate air pollution's impact on their own health and future; how scientists and policy makers address the issues of risks related to indoor (rural) as compared to ambient (urban) pollution; and whose voices are heard in the media. The urban field site will be a polluted city in a county of Zhejiang (the city where the app of Case 1 is developed), and the rural village site will be in a mountainous areas close to this city.

Scholars working on Case 3: Mette Halskov Hansen, Liu Zhaohui, Kristin Aunan, Shi Yao, Cuiming Pang (8 months), PhD student.

We are aware that the three cases that we intend to investigate may seem difficult to pursue in the context of China. However, *Airborne* is made up of a combination of experienced scholars and very promising junior researchers. All have profound knowledge of China (and most are fluent in the Chinese language), have established local contacts, and understand how to carry out research in China. Each case is designed in a way that we believe will grant us access to sufficient amounts of relevant data, even if we encounter unexpected challenges or problems – something that is indeed not uncommon when doing fieldwork in China.

Academic Publication and Public Dissemination

The concrete academic output will be:

- At least nine co-written academic articles targeted at international journals (three within each case), and a special volume of a high level international interdisciplinary journal edited by the project coordinator.
- One book-length interdisciplinary monograph (rather than an anthology) will be co-written by the project coordinator and 2-3 participants. The University of Washington Press has expressed initial interest in this.
- One PhD (article based or monograph) thesis.
- One book length manuscript or 4 international articles written, or co-written, by the postdoctoral candidate.
- One edited book written especially for a broader Chinese readership, including policy makers, journalists, and NGO activists. One of China's major publishers (*Shangwu Yinshuguan*) has shown initial interest in such a book.

Other plans for public knowledge exchange:

- Participants are committed to active media participation in Norway *and* China, and our media scholars will organize an interactive project webpage with updated news and presentations of research in both Chinese and English.
- Senior scholars with teaching obligations will organize joint master courses at Zhejiang University and the University of Oslo (for Chinese and Norwegian students) based on topics, methodologies, and results of *Airborne*.
- One yearly publicly open *Airborne* seminar will be organized in Oslo or in Hangzhou to disseminate results and discuss topics of general interest with policy makers, NGOs, individual activists, journalists, and academics.
- We will launch a Twitter account called “Air News” with updates from the project, and an equivalent account on Chinese Weibo (with news from the project in Chinese).

Project Coordinator and Participants

Airborne is directed by Professor Mette Halskov Hansen who has a record of international publications in the field of contemporary China studies (<http://www.hf.uio.no/ikos/english/people/aca/mettehh/index.html>). Her most recent work focuses on dynamics of education and processes of individualization, combining theories of risk and

individualization with theoretical perspectives of governmentality. The fieldwork behind Hansen's latest book (2014) started in a rural area in Zhejiang in 2008 – the province where a major part of *Airborne's* fieldwork will take place. At that time there was scattered local concern about polluted rivers especially, but hardly any interest at all among school teachers and administrators in environmental education or scientific knowledge about the environment. This situation changed considerably by 2012, and the public demand for scientifically based information, not the least regarding air pollution in Hangzhou and major industrial areas of Zhejiang, has since then become a burning political issue, directly connected to debates about how to educate youth to become environmentally conscious without compromising political loyalty.²⁶

Hansen speaks and reads Chinese, and has more than twenty years of experience with academic cooperation and anthropological fieldwork in China, especially in rural areas which is important especially in Case 3 and in “map the app” of Case 1. Hansen has initiated and directed international research projects including Chinese scholars and institutions. She will have the overall responsibility for ensuring interdisciplinary and international cooperation between the participating researchers, and for reaching the targets of academic output. Hansen's own research in *Airborne* will be financed by the University of Oslo (IKOS).

Six scholars will spend between 50 and 100 percent of their research time, financed by the University of Oslo and Zhejiang University (ZJU), on *Airborne* research:

Rune Svarverud, UiO, <http://www.hf.uio.no/ikos/english/people/aca/runesva/>

Anna Ahlers, UiO, <http://www.hf.uio.no/ikos/personer/vit/annalah/index.html>

Li Hongtao, ZJU, China <http://mypage.zju.edu.cn/en/hongtaoli>

Liu Zhaohui, ZJU, China <http://www.cpa.zju.edu.cn/eng/show.aspx?id=149&cid=9>)

Gao Fangfang, ZJU, China <http://csp.zju.edu.cn/default/content/index/id/387>

Cuiming Pang, UiO, (8 months in 2015), <http://www.hf.uio.no/ikos/personer/vit/cuimp/index.html>

Two environmentalist chemist from ZJU will spend 20 percent of their research time, financed by ZJU. They have long-term experience in working with air pollution and related policies in China and the US, and the necessary contacts to local authorities, including the company developing the app we study in Case 1:

Shi Yao, ZJU, <http://mypage.zju.edu.cn/en/119>

He Yi, ZJU, <http://mypage.zju.edu.cn/en/yihe/0.html>

Bryan Tilt, environmental anthropologist, <http://oregonstate.edu/cla/anthropology/tilt> , joins the project as a senior advisor and participant in Case 1. His work includes long-term field studies of local perceptions of air pollution and health, and relations of science and popular perceptions, and he supervises a PhD student who is doing fieldwork on air pollution in Tangshan, one of *Airborne's* two main field sites.

Airborne depends on funding research time for two natural scientists, both internationally leading experts in the field of air pollution:

Kristin Aunan, Centre for International Climate and Environment Research, CICERO

http://www.cicero.uio.no/employees/homepage.aspx?lang=EN&person_id=14

Wang Shuxiao, Tsinghua University, China (her funding will be in the form of guest research scholarship in Norway)

http://www.tsinghua.edu.cn/publish/enven/6309/2011/20110215211647847219770/20110215211647847219770_.html

Three other senior scholars from Germany, Denmark and Norway are connected to the project as academic advisors with long-term international experience in working with air pollution and

²⁶ e.g. Hansen 2013 and 2014.

climate change globally (Stordal), the introduction of Western sciences to Europe (Amelung), and climate change policies in Chinese contexts (Delman). They will join our workshops, serve as advisors in connection with fieldwork and data collection, and take part in research when possible: Frode Stordal, UiO, <http://www.mn.uio.no/geo/english/people/aca/metos/frodes/> Jørgen Delman, Copenhagen University, <http://ccrs.ku.dk/staff/profile/?id=115128> Iwo Amelung, Goethe University, Frankfurt am Main, https://www2.uni-frankfurt.de/43089859/amelung_veroeffentlichungen

The project needs one postdoctoral and one Phd researcher. The postdoc will work closely together with senior scholars in Case 2. The case compares two sites (Tangshan and Hangzhou) that are geographically very far from each other, and require considerable fieldwork and local networking. The PhD student will do long-term fieldwork as part of Case 3, studying how rural men and women experience indoor air pollution, how they prioritize different sources of energy in daily household activities, and how they view and engage in activities to improve the quality of air both in the short run and in a long-term perspective. These junior positions are crucial for the research of *Airborne*, and they are important for competence building in Norway and beyond. The junior researchers will work in close cooperation with senior scholars in all the processes of collecting, analysing, and disseminating data.

Gender Balance and Ethical Concerns

Six participants (including the project director) are female, and there is a good balance too between junior and more established senior scholars. The issue of gender has rarely been integrated in research of exposure, and public and political responses to air pollution and especially for our Case 3 this is a key topic.

Airborne will follow the standard ethical Norwegian research guidelines (e.g. expressed in NESH). All field research in China will be carried out in close cooperation with Chinese scholars who have profound knowledge of Chinese requirements of ethical considerations and are based at two of China's highest ranking universities where such issues are well established among scholars.

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