

An Investigation report on the policy environment of “clean cooking” in China

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1 Executive Summary

While China has made a lot of progress in providing its massive rural population with access to electricity, there is still room to promote the concept of ‘clean cooking’. The challenge in conveying the idea of ‘clean cooking’ to Chinese authorities lies in the presumably tiny proportion of energy consumption and caused pollution by cooking. The Chinese farmers’ reliance on crop straw makes deforestation an insignificant concern in policy making; yet, there are other angles such as improving people health that could be employed to approach the issue. China’s NDRC has had some initial collaboration with the Clean Cooking Alliance, which could be a useful clue for MECS propose its intention of collaboration. In China, the State Grid is advocating the idea of ‘All-electric kitchen’ while some NGOs are helping farmers to adopt clean stoves at grassroots level. Both could be useful contacts for MECS to explore China.

2 The Situation in General

Out of the 2.8 billion people worldwide without access to clean cooking fuels and technologies, 544 million live in China¹. As of 2018, the population in China that still relies on traditional ways of cooking is only smaller than that of India, according to a joint report by a number of international agencies. Since the vast majority of urbanized Chinese have already for years been cooking with piped natural gas and electricity, it is safe to predict those 544 million in China are almost all from rural areas. Indeed, if someone is to picture folks practicing ‘unclean cooking’, a lifestyle featuring collecting, sorting and burning firewood, crop straw, charcoals or coals, etc., it is hard to imagine any Chinese would still be able to do it in China’s urban settings. The question of ‘clean cooking’ is by and large a subject relevant solely to Chinese rural population as they are where most potential lies in terms of promoting the shift from traditional cooking methods to modern clean cooking.

While the absolute number of 544 million ranks China to be the second among the top 20 countries lacking access to cleaning cooking, the 2014 to 2018 average access rate in China, which stands at 61%, is actually one of the highest, according to the same report. Given the size of China’s total population is larger than 1.4 billion, a simple calculation of subtraction would give us some idea how many Chinese people do have the access to clean cooking. This optimistic way of looking at it is consistent with Chinese numbers too. China’s official statistics clearly reflect the trend of ‘diversification’ measured by the categories of energy sources used for cooking by its rural population. From 2006 to 2016, massive number of Chinese farmers shifted from overwhelmingly relying on grass, firewood and coal to a good variety of cooking energies. Such a change is clearly reflected by the comparison between figure 1 and figure 2.

¹ Chapter 2 ACCESS TO CLEAN FUELS AND TECHNOLOGIES FOR COOKING of *Tracking SDG 7: the Energy Progress Report 2020*, by International Energy Agency, International Renewable Energy Agency, United Nation Statistics Division, The World Bank, World Health Organization.

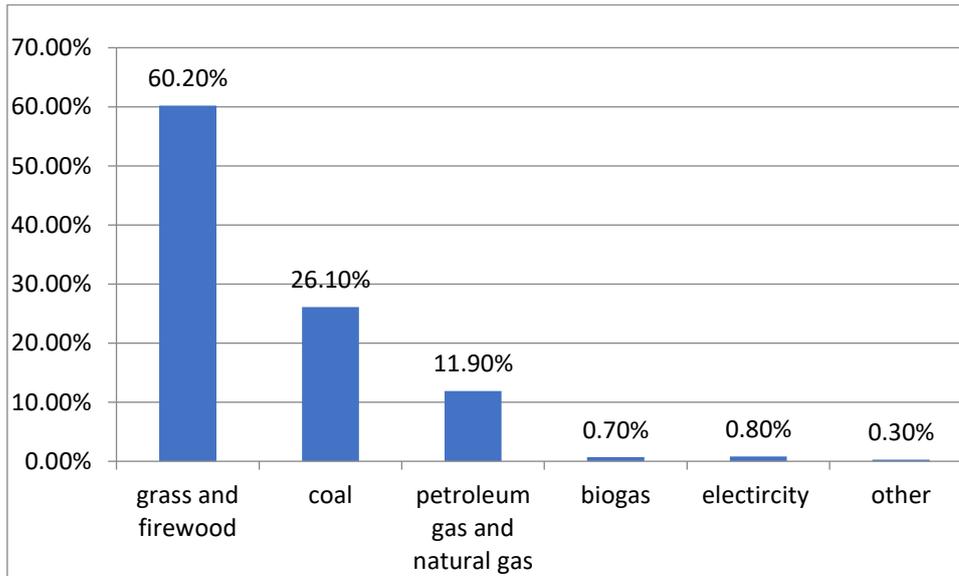


Figure 1: Percentage Breakdown of Energy Sources for Cooking in Rural China in 2006²

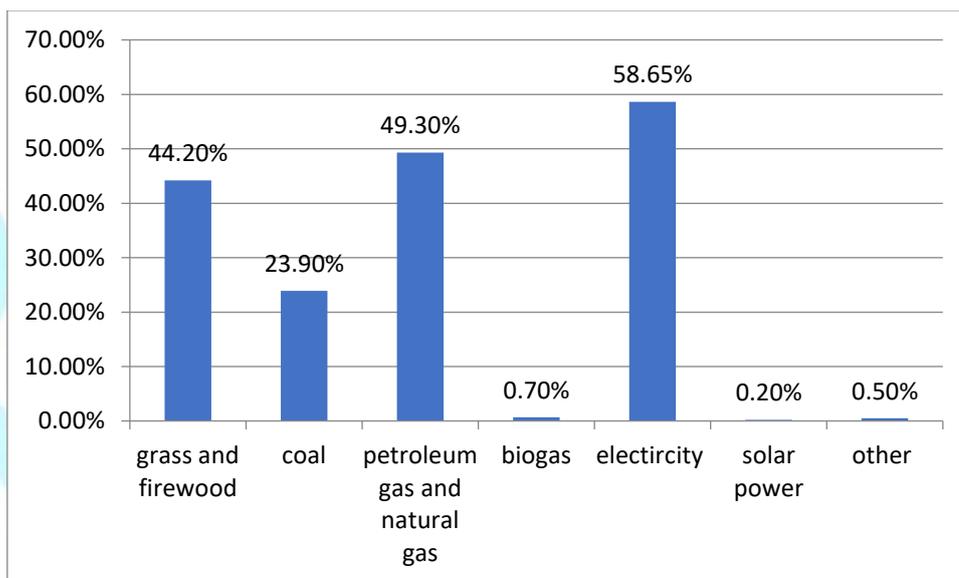


Figure 2: Percentage Breakdown of Energy Sources for Cooking and Heating in Rural China in 2016³

‘Diversification’ is the term used by both Chinese authorities and Chinese researchers to describe what has happened in rural China in terms of energy consumption. If the shift at issue is to be called ‘revolution’, the ‘energy revolution’ has been sweeping Chinese countryside several rounds for the past decades. When collecting and burning biomass was initially realized to be unsustainable in the 1960s and 1970s in rural China, biogas was considered to be a convenient and cost-effective choice to replace it. President Xi Jinping himself is well known to lead his fellow villagers to build the first biogas pool in the village where he was descended to, among the hundreds of thousands young urban Chinese, as part of Mao’s political campaign during from 1960s

² The Public Statistical Brief of the Second Agricultural Census, National Statistics Bureau, 2008

³ The Public Statistical Brief of the Second Agricultural Census, National Statistics Bureau, 2017

⁴ Each surveyed respondent was asked to name two of their major energy sources for cooking, so the addition of the percentages is larger than 100%.

to 1970s. Yet, biogas failed to become an established energy regime due to its lack of reliability. Its usage remained sporadic and minimal today. As China later started to industrialize itself, coal began to be adopted by Chinese rural residents during the 1980s, which proved to be a more efficient cooking energy source. It must be noted though, back then environmental and health issues were barely mentioned when coal started to replace portions of biomass fuels. Efficiency, economy and the symbolic meaning of the coal industry dominated the narrative. Nevertheless, environmental and health concerns, sustainability issues finally made their way to China's policy discourse since the 1990s. So the concept of energy being clean as well as efficient began to take shape. The answer to the problem thus became building infrastructure of clean energy, for instance natural gas pipes and electric grid, in China's rural areas. Overtime, this eventually led to the diversification of cooking energies in rural China.

The most significant contributing factor to such 'diversification' trend is the popularization of access to electricity in rural China, as can be noticed in figure 2. The proportion of residents considering electricity to be their primary source of energy for cooking jumped from 0.8% to 58.65% in one decade. According to China's National Energy Administration, in December 2015, 100% of its rural population had full access to electricity. This was the result of several rounds of grid construction and upgrading. Compared to China, only 47.66% of the people from Sub-Saharan Africa had access to electricity as of 2018⁵. So while acknowledging both Sub-Saharan Africa and China are both major contributors to the worldwide population still relying on traditional cooking methods, there is a big difference between having no access to clean energy and not putting it into practice.

Among the many factors Chinese rural residents having gained access to electricity yet not using it to make their food, such as higher cost, lack of awareness, having no proper cooking facilities, 'habits' seem to be a persisting one⁶. The Chinese cooking methods is a way of life deeply enshrined in its culture for generations. This could make it a significant barrier that prevents families from adopting new energies and modern cookware. For instance, a fundamental difference between Chinese cooking and Western cooking is that the seasoning and heating process are done simultaneously in Chinese cooking while they tend to be separate in the West. This explains why stir-frying is used a lot more often in Chinese cooking than in Western cooking methods. The separation of seasoning and heating also makes oven a commonplace facility in western kitchens, whereas in China it is still a rarity. Also, the Chinese cuisine places more importance to flavor than nutrition than the west, which makes many Chinese chefs believe they could only achieve the right taste by using flames.

To sum up, the massive population, the clear rural-urban divide, the rapid progress in building infrastructure, the cultural traits, all of these make China a unique place when it comes to the issue of shifting from traditional cooking methods to modern clean cooking. To delve into the policy environment surrounding clean cooking in China, one must be able to look at China from its own perspective. This would help to understand why some of its policies are more effective than others.

3 The Stakeholders of Policy Making and Implementation

While 'Clean cooking' is only a minor issue against the broad Chinese policy rhetoric due to its apparent narrow focus, it could be related to multiple stakeholders. The methodology used in this report was to find those most relevant stakeholders, and in what ways they are relevant to the subject by going through their official websites and other online resources to search for any reports, studies or stories related to 'clean cooking' in each stakeholders' scope. This exploration was not limited to government bodies as non-governmental entities may play significant roles in influencing and implementing policies.

⁵ <https://data.worldbank.org/indicator/EG.ELC.ACCS.ZS?locations=ZG>

⁶ <https://www.sciencedaily.com/releases/2019/12/191205155319.htm>

As mentioned early, the ‘targets of policies’ in regard to clean cooking in China is inescapably Chinese farmers, because they are the ones who are still cooking with biomass solid fuels and coals. The **Ministry of Agriculture and Rural Affairs (MARA)** is thus the priority in the search list. Every year, MARA issues a document titled *Key Work Plans for the Science and Technology, Education, Environment and Energy Affairs*⁷, which contains MARA’s most relevant work regarding ‘clean cooking’. For example, in the latest 2020 version of this document, it says MARA is to ‘*Vigorously develop rural renewable energy. Promote the transformation and upgrading of rural biogas, strengthen the high-quality utilization of biogas residue and biogas slurry, and accelerate the disposal of waste rural biogas facilities. According to local conditions, promote the technical modes of straw-bundle direct-combustion heating, processed biomass fuel, biogas gas heating and solar energy utilization, and create a number of rural energy multi-energy complementary and clean heating demonstration sites. Hold the Rural Clean Stoves Expo to speed up the promotion and application of high-efficiency and energy-saving stoves.*’

The above excerpt indicates that for MARA, it sees the issue of ‘clean cooking’ to be mainly developing renewable energies and promoting energy-saving stoves in rural areas, a kind of two-fold approach. The 2018 and 2019 versions of the same annual document confirm this two-fold approach and it can be inferred that MARA is mostly involved in ‘advocating’ the adoption of renewable energies and promoting energy-saving stoves. Within MARA, there is this **Rural Energy and Environmental Agency (REEA)**⁸, an affiliate to MARA, which is specifically tasked to fulfill MARA’s duties on these two fronts. Since 2015, REEA has been championing a project called Clean Stove Pilot Villages⁹ across China.

However, it has to be noted MARA’s role in promoting clean cooking is not a powerful one as it is not in charge of China’s energy issues in general. The key word to understand MARA’s role is ‘advocacy’. Since its scope is mostly about agricultural production and rural affairs, it is in a convenient position to inform Chinese rural families to adapt to clean cooking. Yet this does not mean MARA possesses the necessary resources to make the shift happen. According to MARA’s 2018 version of *Work Plans for the Science and Technology, Education, Environment and Energy Affairs*¹⁰, it planned to draft a key document very relevant to ‘clean cooking’, namely *The Rural Area Clean Cookstove Upgrading Plan*. Sadly, this document failed to materialize according to my contact in MARA. It remained a draft till the end because China’s **Ministry of Finance** didn’t agree to allocate the necessary finance to support its implementation. My contact also said for MARA’s most efforts to promote clean cooking facilities, it has to rely on the market force, such as holding expos attended by stove manufactures, to help its adoption by Chinese farmers.

The **National Energy Administration (NEA)** is also related to ‘clean cooking’ as it is the department that drafts China’s national energy strategies, policies and regulates energy sector operations including coal, electricity, oil and gas, and nuclear power. The amount of energy consumed for cooking is tiny in comparison to other major uses such as industrial production, infrastructure maintenance or heating. This explains why NEA’s published documents have no mention of words like ‘cooking’ or ‘stove’. Most of NEA’s policies deal with the general issues regarding China’s energy transition, diversification, and emission reduction, etc.

Despite having no direct mention of ‘clean cooking’, NEA does consider China’s rural areas to be one of its major battlefields to achieve policy goals. For example, the NEA-drafted 13th Five-Year Energy Development Plan¹¹ called for ‘*fresh round of electric grid upgrading in rural areas*’, ‘*vigorously develop multiple kinds of clean energies in rural areas*’ and ‘*help to achieve poverty-reduction through measures of energy*’.

⁷ http://www.moa.gov.cn/xw/bmdt/202002/t20200225_6337679.htm

⁸ <http://www.reea.agri.cn/>

⁹ http://www.xinhuanet.com//politics/2015-04/28/c_127743391.htm

¹⁰ http://www.kjs.moa.gov.cn/zcjd/201904/t20190418_6184803.htm

¹¹ http://www.nea.gov.cn/135989417_14846217874961n.pdf

Two major state-owned enterprises ought to be included if we look at ‘clean cooking’ from the perspective of energy, the **State Grid (SG)** and **China Southern Power Grid (CSPG)**. These two public utility juggernauts split the Chinese market of investment, construction and operation of power grids, with the SG covering most provinces except Guangdong, Guangxi, Yunnan, Guizhou and Hainan being covered by CSPG. The grid operators are significant to the issue of ‘clean cooking’ not only because they are the pioneers to implement NEA’s policies making sure Chinese rural areas to have reliable electricity provision, but they are very motivated to help ordinary Chinese to adapt to electricity for multiple purposes including cooking. With their local branch companies and technical units, both companies have been championing the use of electricity for cooking. Their motivation is easy to comprehend because as companies they would love to sell more of their products and services while in the meantime help implement national policies.

The **National Development and Reform Commission (NDRC)** is an overarching department in formulating and implementing China’s strategies of national economic and social development, annual plans¹². NDRC is related to ‘clean cooking’ as it is the representative organization to collaborate with the Clean Cooking Alliance (CCA). China joined the alliance in 2012 and NDRC signed a memorandum with CCA representatives in 2013. The CCA agreed that it is going to support China in areas of making standards for stoves and fuels, energy-saving tools, market access, public awareness promotion and strategic planning. I reached out to my contact in NDRC’s international department to ask if there is any following-up activities to substantiate the collaboration, her response indicates there hasn’t been much collaboration in substance. So NDRC is ready to play its part in terms of pushing forward the international cooperation regarding cleaning cooking, yet they don’t seem to have the right implementing bodies to carry out corresponding activities.

Clean cooking is obviously a matter for the sake of the environment too. In recent years, with the deteriorating air quality, especially in North China, to reduce the amount of PM2.5 has become a priority for the central government. The **Ministry of Ecology and Environment (MEE)** is the chief department to champion that course. In an key document published by MEE, the *Action Plan for Comprehensive Treatment of Air Pollution in Beijing-Tianjin-Hebei and Surrounding Areas from 2019 to 2020*¹³, a whole basket of measures were proposed to tackle the air pollution problems, yet no trace of ‘cooking’ or ‘cookstove’ could be found. The most relevant measure to ‘clean cooking’ from the perspective of MEE is that the widespread use of ‘loose coal’ is no longer to be tolerated in rural areas. However, MEE only stresses the coal used for heating, not cooking, again probably due to its insignificant amount relative to other purposes. There had been rumors on the Chinese internet that MEE and its local branches are going to ban farmers from cooking with firewood, straw residuals and coals. The rumors were soon dispelled by MEE. This reflects the insignificance of cooking from the standpoint of MEE.

Other than government bodies and enterprises, there are also NGOs (more commonly called ‘social organizations’ in China) that are involved in ‘clean cooking’. The **Stove Specialty Commission**, which is part of **China Rural Energy Industry Association** based in Beijing, is tasked to undertake the duties of **China Alliance for Clean Stoves**; its members include enterprises and individuals in China that have the expertise in researching and manufacturing clean stoves. Most of MARA-sponsored expo of stoves for rural areas is organized by this social organization. Another NGO associated to ‘clean cooking’ is the **Global Environmental Institute (GEI)** based in Beijing, GEI’s managed to get some funding from various sources to pilot clean stoves in designated Chinese villages. It also organized seminars to discuss the issues surrounding clean stoves¹⁴.

¹² https://en.ndrc.gov.cn/mfndrc_8237/200812/t20081217_1193980.html

¹³ http://www.mee.gov.cn/xxgk2018/xxgk/xxgk03/201910/t20191016_737803.html

¹⁴ <http://www.geichina.org/promoting-clean-cook-stove-technology-with-beijings-leaders/>

4 Policies and Initiatives

To understand China’s policies pushing for clean cooking, one must realize there is this contextual difference in China from the international discourse. When it comes to clean cooking, China does have its own narrative. The critical difference is that in China the major impetus behind shifting from traditional cooking to modern clean cooking is not people’s wellness but to achieve national goals. This is why there are very few policies from the perspective of safeguarding people health. Most policies are to address issues of energies, or to tackle the general environmental issues at national level. The issues of household wellness, in particular those living in rural areas, seem to be left to NGOs to take care of.

After reading carefully a number of strategies, plans and policies issued by various government bodies at both central and local levels, three ‘directions’ of policies caught my attention to be most relevant to ‘clean cooking’. I call them directions because in China policies are usually made and implemented in groups. The multi-layered government bodies and various entities involved over the course of implementing the policies means one single policy document can hardly tell the whole stories. These three directions are ‘Electrical energy substitution’, ‘Replace coal with gas or electricity’ and ‘Appliances to the countryside’.

4.1 Electrical energy substitution

Among the many measures being proposed by NEA, the ‘Electrical energy substitution’ scheme is the most worth-noting one as it has established a complete and clear ‘chain of command’ from top government body to end users regarding clean cooking.



Figure 3: The Chain of Command of ‘Electrical energy substitution’ Policies

In 2016, the NEA issued *Guidelines for Electrical Energy Substitution*¹⁵, calling for the achievement of a set of clear goals including ‘by 2020, to let electricity replace the total consumption of bulk coal and fuel oil by about 130 million tons of standard coal, increase the proportion of electric coal in coal consumption by about 1.9%, and increase the proportion of electric energy in terminal energy consumption by about 1.5%, to promote the proportion of electric energy in the terminal energy consumption to reach about 27%.’

¹⁵ http://www.nea.gov.cn/2016-05/25/c_135387453.htm

The general ‘modus operandi’ of Chinese policy is central government agency issuing ‘guidelines’ or ‘principles’ and announcing ‘policy targets’ for a policy scheme, while leaving the rest of the work to local governments to work out specific measures. So in 2017, the Energy Bureau of Anhui Province accordingly announced its implementation policies to NEA’s national guidelines. While ‘everyday life’ and ‘commercial services’ were not designated fronts in the national guidelines, they gained such status in Anhui’s policies. *The Implementation Opinions on Promoting Electricity Replacement in Anhui Province* says ‘In area of everyday life, the province is to promote the use of household appliances, in particular to encourage the use of electric cookers such as induction cookers, microwave ovens, and rice cookers in rural areas to replace coal (firewood) used in kitchen cooking. In commercial services, it is to promote the use of electric steamers, electric ovens and other kitchen appliances in the canteens of enterprises and public institutions to replace gas (coal) stoves.’ The municipal government of Hefei, which is the capital city of Anhui province, issued similar policies in accordance with the provincial policies, also highlighting the substituting old-fashioned cookware with electrical cooking facilities.

The above story of Anhui province and Hefei City is just one demonstration of how ‘Electrical energy substitution’ policy is passed down from NEA to local governments. It can be inferred that other localities have followed suite similarly. Such top-down approach is a basic operating mechanism in China’s governance model when it comes to policy.

To really carry out “Electrical energy substitution’, some further down-to-earth initiatives have to be figured out and it involves persuading end users. In China, this is the job for the local branch companies of SG and CSPG. One prominent initiative by SG and CSPG that has been promoted most recently is the ‘All electricity kitchen’ programs in various settings. My explorations into this program has led to multiple accounts in Shanghai, Zhejiang, Jiangsu, Beijing, Hubei, Hunan provinces. The idea of ‘All electricity kitchen’ is to replace the old cooking facilities, which mostly consume LNG or LPG in school canteens, shopping malls or ordinary households, with complete set of electrical cooking appliances that generate zero emission with guaranteed safety. As part of the general ‘electrical energy substitution’ strategy, the SG and CSPG have been promoting awareness among businesses and individual families, piloting a number of demonstration cases in various settings.

For example, in Shanghai, the local State Grid Company provided a customized solution for a shopping mall’s restaurant section, completely substituting the its traditional cooking facilities in the kitchens with electrical appliances. Prior to the project, the technical unit of State Grid Company Shanghai provided a lot or assurance to restaurant owners and mall managers the cost of initial investment will be offset by the lowered operation cost. After completing the construction work of ‘all electricity kitchen’, SG Shanghai also sent its technicians to check for safety regularly. So far, this shopping mall with ‘all electricity kitchen’ has gained a lot of fame in Shanghai. The idea of ‘All-electricity kitchen’ was well received by chefs as well as restaurants’ customers.



Figure 3: A typical 'All-electric kitchen' in China. The concave stovetop making sure full contact with the wok is in fashion.



Figure 4: The flagship product 'Electric Flame Cooker' of the Chinese company Dragon Driver, which claims to be the first one globally to have used electric arc to produce cooking 'flame'.

4.2 Replace coal with gas or electricity

Burning loose coal for heating in North China is seen by the Chinese government as a major contributor to air pollution. Households in Chinese cities now rarely burn coal for cooking purposes. The majority of those still doing this are from rural areas. The major reason of coal gaining preference by farmers over electricity and gas in rural China is its economy. Led by MEE, a couple of ministries have been involved in making and implementing policies to reverse this preference. It must be said that none of these measures in the direction of 'replace coal with gas or electricity' is to encourage 'clean cooking' directly. However, it is natural to foresee in preparing food

there is a higher chance for farmers to give up coal for other energies when they are no longer using coal to warm up their houses.

Since 2016, a series of policies targeting air pollution were issued by the Chinese government. The focus to improve air quality is area surrounding Beijing, which has seen the worst deterioration in air quality.

Time	Policy Documents Issued
July 2016	Beijing, Tianjin and Hebei air pollution Strengthening prevention and control measures (2016-2017)
Feb 2017	Beijing, Tianjin and Hebei Work Plan for Air Pollution Prevention and Control in 2017
May 2017	Notice on carrying out central finance to support the Northern China Pilot Cities of Clean Heating in Winter
Aug 2017	Beijing-Tianjin-Hebei and surrounding areas Autumn-winter 2017-2018 Action plan for comprehensive treatment of atmospheric pollution
Dec 2017	Winter heating planning in the northern region (2017-2020)
Jun 2018	The Battle of Blue Sky Defence from 2018 to 2019 Intensified inspection plan for key areas
Jun 2018	Three-year action plan to win the blue sky defense battle

Table 1: Policies published in recent years to tackle air pollutions in China

Although the Chinese central government required the coal to be replaced by either electricity or gas, considering the varying conditions of infrastructure of gas pipes and power grids of different local governments, electricity seems to be the major focus as a substitute. This may be because rural China has better access to power grids than to gas pipes. Construction of gas pipes is also with higher cost than building grids in rural areas.

According to the above listed documents, the general goals of cutting emission and improving air quality is that by 2020, in the areas surrounding Beijing must see emission of sulfur dioxide, nitrogen and oxygen compound decrease by more than 15% compared with 2015. The number of cities below the desired level of fine particle concentrations must decrease by 18% compared to 2015. Proportion of days with air quality above the level of 'excellent or above' in cities of this area must reach 80%, the proportion of days with severe pollution should be lower by 25% than that in 2015.

The major barrier for rural households to give up coal and start using gas or electricity is the initial cost in purchasing facilities and the later increase in consumption. To encourage households to shift to electricity or gas, the governments at central and local levels proposed a series of subsidies program.

Generally speaking, the subsidies come in two-folds. On the one hand, the central government subsidizes local governments for their efforts in advocating clean heating. For example, from 2017, municipalities directly under the rule of central government, provincial capitals, and prefecture-level cities each year shall receive 1 billion yuan, 700 million yuan and 500 million yuan worth of subsidies respectively¹⁶. On the other hand, the government would give subsidies to enterprises that are to implement corresponding projects. The provincial governments and municipal governments are also expected to provide supplements to supporting power grid projects. In addition, the NEA asked for improving the peak-valley time-sharing system and the ladder price system, innovating the electricity trading mode and improving the transmission and distribution price system and other methods to reduce the cost of electricity for clean heating.

¹⁶ Notice on carrying out central finance to support the Northern China Pilot Cities of Clean Heating in Winter

To have a better idea of such subsidies, here is one concrete example on how they matter to ordinary households. As part of the mentioned subsidies, in 2019, the Xiqing District of Tianjin City, which is at the intersection of Tianjin's rural and urban areas, provided a subsidy of 0.25 yuan/kWh to residents who have completed the clean heating renovation and started using clean heating equipment. The subsidy allowed the residents to enjoy the low electricity price of 0.3 yuan/kWh from 8PM to 8AM every day. The maximum amount of electricity to be subsidized per household is E8000kw/h. In addition, Xiqing District added 400 yuan per household as cooking energy subsidies.

Despite all the advocacy and subsidizing efforts, there remain many rural area households who are still using coal for heating and cooking in their everyday lives. The government expects it to be a long battle to change the 'habits' and 'perception' of rural residents to shift to clean energy. The subsidies are subject to rise so as to strengthen the efforts to make the change.

4.3 Appliances to the countryside

The policy direction of 'Appliance to the countryside' literally means to send domestic appliances to Chinese rural residents. Domestic appliances used to be a privilege mostly enjoyed by city dwellers in China. Starting from 2007, there have been several phrases of 'Appliance to the countryside' policies in order to boost demand of Chinese rural families. This policy instrument has been left idle for several years and there are new signs it might be adopted again. Compared to the last two directions I have just analyzed, research on this policy direction is more of a futuristic approach to look at what might happen next.

The policies on rural purchase of consumption matter to 'clean cooking' as shifting from burning straw residuals and coals to clean cooking invokes not only use of new energies but new tools. The very reason 'Appliance to the country side' was withdrawn in 2013¹⁷ was because after several rounds of stimuli, mainly in the form of purchasing subsidies, households in rural China have already owned rich categories of domestic appliances. These include TV sets, air conditions, fridges, washing machines, mobile phones, etc.

Boosting consumption has always been a major policy direction for the Chinese government as it has the largest domestic market in the world. The situation now in regard to Chinese rural consumers is that new potential for consumption must be exploited so as to break the deadlock after several rounds of 'Appliances to the countryside'. In 2019, the state council issued the *Implementation Plan on Further Optimizing the Supply to Promote Steady Growth of Consumption and the Formation of a Strong Domestic Market (2019)*¹⁸, in which it calls for 'promote the replacement of household appliances. Where conditions permit, consumers can be sold old appliances (refrigerators, washing machines, air conditioners, televisions, **cookware**, water heaters, stoves, computers) and appropriate new subsidies can be purchased to promote the sale of high-quality new products.' The policy specifically mentioned cookware as a domestic appliance to be promoted.

In the meantime, the Beijing Municipal Government initiated a new round of energy-saving subsidies' for a new list of domestic appliance. What is worth noting is, for the first time, 'electrical rice cooker' and 'induction cooker' were added into the list to promote their purchase¹⁹. Other than these two developments, there have been widespread calls from Chinese scholars for the governments to reexamine household needs so as to pinpoint commodities more accurately with the strongest potential demand. It looks increasingly the central government is going to highlight electric cookware in the upcoming round of 'Appliances to the countryside' policies.

¹⁷ <http://www.xiangcun.com/news/show-1786.html>

¹⁸ Further optimization of supply to promote steady growth of consumption and implementation plan to promote the formation of a strong domestic market (2019)

¹⁹ <https://hc.suning.com/help/channel-153319811153626357/K15350090425711300.htm>

5 Progress

The International Energy Agency (IEA) recorded that China made continuous progress from 2000 to 2018. According to IEA' numbers, China's proportion of population with primary reliance on clean cooking facilities reached 71.3% in 2018 (Table X)²⁰.

Year	Percentage
2000	46.8%
2005	50.8%
2010	54.9%
2015	66.3%
2018	71.3%

Table 2: China's proportion of population with primary reliance on clean cooking facilities (2000-2018)

Much of the progress made by China could be attributed to the improvement on access to electricity, LPGs and LNGs, as these are the fronts related to clean cooking where China has been making its efforts. While admitting the progress, there still exists this difference between having the right facilities and practicing 'clean cooking'. Again this reflects the unique situation in China: despite the wide access to clean energy and facilities, the entrenched old cooking habits might still prevents clean cooking being practiced.

The health threat caused by traditional cooking is still serious. In 2017, the premature deaths caused by indoor pollution caused by solid fuel cooking in China stood at 271,100 people, and 11% (81,400 people) of chronic obstructive pulmonary disease patients were attributed to household solid fuel burning. The situation is more serious in the central and western regions, where 9% of neonatal deaths (7 to 365 days) in the country are attributed to household solid fuel combustion. This stark situation is echoed by the general response to the government advocacy to cleaning cooking. While there is no official statistics on how many Chinese people have abandoned traditional cooking methods in China, there is widespread opposition on the internet against any suggestions farmers should give up burning crop straw and other traditional cooking methods.

This is understandable as in most remote areas in China, the commercial fuels like natural gas and LPG are expensive in comparison with nearly free biomass fuels and cheap coals. This could give us some clue on why the pace of Chinese rural residents shifting to clean cooking has been slow. The factors influencing the decision to abandon or not abandon traditional cooking include location, income, switching cost, education, and family structure, as suggested by scholars studying this²¹. While noticing the general reluctance to change, geographical variances do exist. For example, since easiness and cost of solar energy is influenced by local conditions like sunlight intensity, Chinese people from different regions show different attitudes. Residents in Tibet seem to be more willing to switch to solar energy.

While there remain many challenges and barriers to overcome, there have been encouraging signs. In recent years, the State Grid has been conducting the latest round of grid upgrading in some poverty-stricken areas in China. Its statistics suggest that in these areas the category of 'electric cookware' has been fastest growing purchases among local residents, as a result of the awareness raising efforts and policies of local governments. From 2018 onwards, residents of this poor areas bought 266,000 items of cookware, as opposed to 72000 fridges, 127000 washing machines, 211000 TV sets and 143000 electrical processing devices²².

²⁰ <https://www.iea.org/reports/sdg7-data-and-projections/access-to-clean-cooking>

²¹ <https://www.sciencedaily.com/releases/2019/12/191205155319.htm>

²² https://www.sohu.com/a/405268319_362042?_trans_=000019_hao123_pc

In the meantime, in those relatively more advanced areas in China, especially in the towns and cities, sporadic demonstrations of replacing old-fashioned kitchens with all-electric devices are being seen (Table 3). These are just some of the examples I gathered of searching in public media, there should be more than this in reality.

Location	Project Description	Stakeholders
Shanghai	The kitchens of the restaurant section in ‘Momao 580’ shopping mall were completely electrified. The solution is dubbed ‘Energy Manager’ and to be copied in other premises.	State Grid Shanghai, Shopping mall and restaurant owners
Beijing	1000 households in ‘Caochang’ Hutong, a neighborhood near the Forbidden City, had their kitchens transformed to ‘All-electric kitchens’, as part of the efforts to reduce the risk of nearby cultural sites.	State Grid Beijing, local residents, Beijing Municipal Administration of Cultural Heritage
Huai’an City, Jiangsu Province	Local government document required a number of ‘All-electric kitchens’ of school canteens are to be built by the end of 2020. All school canteen kitchens are to be electrified by the end of 2021.	State Grid Huai’an, Huai’an Municipal Government, local schools
Qingyuan County, Zhejiang Province	A number of local school canteen were turned into ‘All-electric kitchens’, as part of the ‘Green energy action plan’.	State Grid Qingyuan, local schools, Qingyuan County Government
Suzhou City, Jiangsu Province	All restaurants along the ‘Pingjiang Road’, a popular tourist attraction with many small businesses, were turned 100% electric, a measure by local governance to reduce the risk of historical sites.	State Grid Suzhou, local businesses, local cultural heritage authority
Loudi City, Hunan Province	The canteen kitchen of Hunan Yukun Mining Group was renovated to be ‘All-electric’. It was the first such project at a company by State Grid Hunan.	State Grid Hunan, Hunan Yukun Mining Group
Haiyan County, Zhejiang Province	The ‘firewood replaced by electricity’ program is to be implemented in 100 households, as and pilot program to demonstrate the safety and efficiency of ‘All-electric kitchen’.	Sate Grid Haiyan, local residents

Table 3: Some of the reported demonstrations of electrified kitchens in China

If the Chinese government is to take ‘clean cooking’ seriously, it will have to adopt a completely new narrative to champion this course. More influence from the international community is needed to let policy makers realize the seriousness of this matter. With the efforts from stakeholders of various local governments and Stage Grid branches, we could see more resources and a more coordinated approach at central government level to advocate ‘clean cooking’ explicitly.

6 References

1. An Jiakun, etc., ‘Analysis and Suggestions on Coal to Electricity Policies’, Shanghai Electrification Technology, 2019
2. Chen Xiaofu, ‘The Development of Global Clean Stoves and its Cooperation with China’, Industrial Forum, 2013

3. Clean Cooking Alliance, *'2019 Annual Clean Cooking Alliance Report'* 2020
4. International Energy Agency, etc., *'Chapter 2 ACCESS TO CLEAN FUELS AND TECHNOLOGIES FOR COOKING of Tracking SDG 7: the Energy Progress Report 2020'*, 2020
5. Liao Hua, *'Residential Energy Consumption in Rural China : Situation, Problems and Solutions'*, Journal of Beijing Institute of Technology (Social Sciences Edition), 2019
6. Simon Batchelor, etc., *'Two Birds, One Stone—Reframing Cooking Energy Policies in Africa and Asia'*, Energies, 2019
7. Tian Yishui, *'Studies on China's Energy Policy, Current Situation and Direction of Development'*, Rural Energy, 2020'
8. The World Bank Group, *'China Accelerating Household Access to Clean Cooking and Heating'*, 2013
9. Vania Vigolo, etc., *'Drivers and Barriers to Clean Cooking: A Systematic Literature Review from a Consumer Behavior Perspective'* Sustainability, 2018