INSIDIOUS POLLUTIONS : toward a new stewardship

FOREWORD

« Houston, we have a problem... »
Fisrt attracted by living conditions in space, I considered acting in the International Space Station. Volatile Organic Compounds were discovered in the ISS and it launched series of researches that led to the constat that indoor air is much more polluted than the atmosphere. I found this transfert exciting and I was wondering how design could reinvest scientific discoveries made in space on Earth, in our daily life. Thus, I realised that science-fiction is an excellent bridge between sciences, reality, anticipation and dreams.
I am pragmatic-natured and I'm keen on sciences, so I finally let myself be convinced by the really concrete problem of insidious pollutions. I aspire to be a responsible designer that take on realistic problems staying positive, in every sense of the term. I don't pretend that designers are going to save the world, but before going to plan B and sending us on Mars, lets first try to improve our situation.

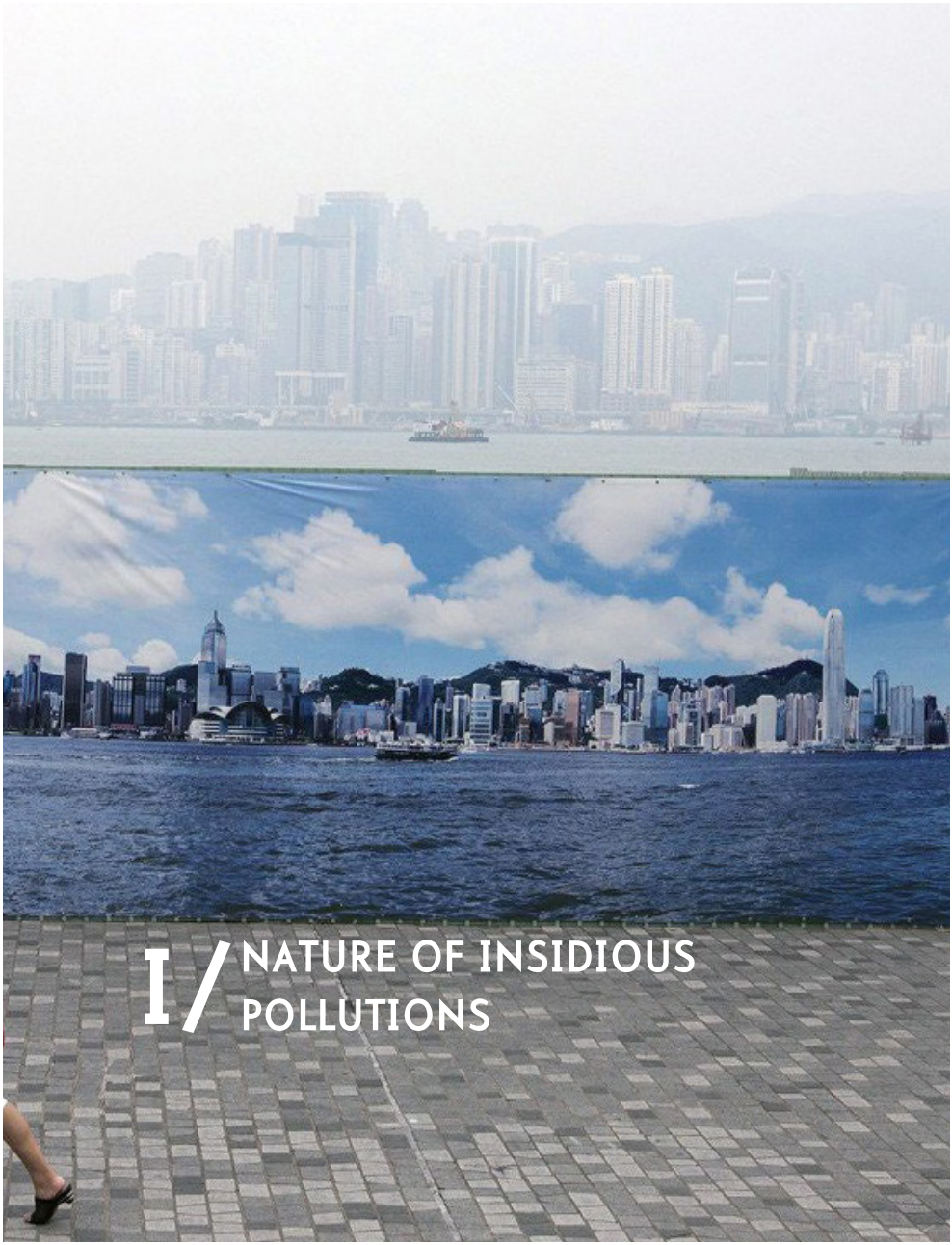
« S'il avait dépendu de moi de ne pas naître, je n'aurais certainement pas accepté l'existence d'aussi dérisoires conditions ».
Fiodor Dostoïevski, *L'idiot*, 1874

INTRODUCTION

Take a deep breath. Do you smell it? No, you don't, yet if you read this abstract in a room with closed windows, safe from the smog from exhaust pipe, in your new sofa or at your desk coming from IKEA, candle burning on coffee table, you probably inhaled a big dose of VOCs. You didn't know? This is the heart of our topic, these pollutions are insidious. It means that they can't be seen or even perceived. Indoor air pollutions are particularly relevant to illustrate this issue. Indeed, air is full of Volatile Organic Compounds including formaldehyde, that are unwholesome for us. Even at a low rate, they can have bad effects on health with a chronicle exposure. how act on them if we can't notice their presence? But more difficult to apprehend, their is a question of trust toward industry. If we admit that pollutions can be present in product we can buy, does it mean a promise was broken?

Air pollution is a very relevant example to talk about these pollutions. It illustrates perfectly the nature of insidious pollutions : invisibility, imperceptibility, trust towards industry, deny. Indoor air pollutions raise more specific matters as how to make people react at their individual scale? What is going to be their reaction toward a danger that is hidden in their habitat and how to make them take their responsibility?

In China, air pollution is admitted and overlay the level of invisible to reach a physical aspect that can be seen. Does it mean that it is better fought? Design tries to bring an answer to fix the problem of polluting atmosphere but the response is maybe more a question : how to avoid the problem before having to correct it with others technical systems.



I/ NATURE OF INSIDIOUS POLLUTIONS

Everywhere at once without our being aware of it

Water is an element where pollutions can be numerous and very hard to see and identify. For example, endocrine disruptors illustrate quite well the imperceptibility of some insidious pollutions at a large scale. Werner Boote and Gerhard Pretting[1] were among the first scientists to reveal and warn about the omnipresence and danger that plastic can represent. In Plastic Planet, they explain how this polymer poisons us. In 1988, two research workers of the Tuft Medical School of Boston were conducting a research work on the impact of oestrogen on breast cancer development when they found out that carcinogenic cells proliferated abnormally in the Petri dish. After months of testing, they understood that the plastic glasswares used for chemical experiments were releasing endocrine disruptors. This scientific discovery was one of the first to highlight the existence of endocrine disruptors and their impact on the human body. Nowadays, we know that these substances have mutagenic and carcinogenic effect on our health. As they are so bad for our health, why not simply take these pollutions out

1 [3]*Plastic Planet: la face cachée des matières synthétiques.* Actes Sud, Arles, 2010.

of products in order to protect us? First, we have to know that these substances are widely used in plastic manufacturing to bind polymers and make them more stable. Bisphenol A was forbidden in the chemical composition of feeding bottle. Why do we continue to use it in other plastics? We are attached to our plastic civilisation. This matter meets our ideal of hygiene and durability. The invention of plastic led to a new world of forms and applications while producing and discharging a lot of pollutants. There is a toxic reality hiding behind its smooth aspect. Should we highlight the impact of these pollutants on our health?

A lot of manufactured products are dangerous because of their composition. But their use is not about to decrease. As it is written in Plastic Planet, « those who suspect each of these materials of being at the origin of nuisances, of certain evils, of a toxic effect, of an impact on the environment (until proof of the contrary) are scarce, since the use is maintained, the consumption is aroused ». Moreover, we live in a disposable society. We buy, we use and we dispose. There is a paradox in our ideal of progress and cleanliness of these consumption goods. They finally break their promise to become insidiously (and hypocritically) polluting. Manufactured products and industrialised furniture contain harmful substances. They have become commonplace by just being introduced in the manufacturing process and

their commercialisation. Even if there is a lack of transparency from industrialists, they don't try to hide as much as before the composition of their products. Indeed, we get used to them and we put up with them. Side effects are not conspicuous so we don't feel concerned. Should we make pollutants visible in these manufactured objects, even if we have to damage our ideal of consumption?

Elusive by the collective unconscious

We cannot see insidious pollutions. By definition, they are impossible to perceive, to see, to smell, to identify, without a specific device. But we can also ignore their existence and where they can be. Moreover, we sometimes know they are present but we deny it. Could we imagine a world where every pollution is identified? We probably wouldn't trust our industrialised society. Insidious pollutions are hard to identify so they are harder to deal with. So how is it possible to fight an evil when we don't even know its existence?

Nevertheless, there are domains where invisibility and volatility have been accepted by the collective unconscious. It means that the whole society accept and comprehend the concept and that it is part of the culture and

even defines the society. Take the example of microbes as an analogy. Admittedly microbes are micro-organismSs but they share many common points with invisible pollutants such as VOCs. For example, both are hostile and imperceptible. First, in the 1870s, Louis Pasteur identified bacterium and germs. Then, the whole society struggled against these invisible beings. George Vigarello wrote about the cleanliness role unheard of fighting enemies that became quantifiable, germs. He said that : « this many-sided being, proliferating on colourful sheets, is not discernible to the naked eye. Consequences are inevitable : to have a wash it is like never work on the invisible ». This chapter is called « Invisible monsters » to qualify microbes that are present despite a spotless appearance. The discovery of these elusive germs led to new collective behaviours and a new definition of hygiene. But nowadays, more than one century later, do we wash our hands because of a hygienic reflex or in order to struggle against microbes? This fear of infection brings people together around the same concern and a common behaviour based on hygiene. Why should indoor air pollutions become part of our collective unconscious?

Now, like microbes, pollutants are omnipresent. As George Vigarello said, « it hides in every private sphere, from the most preserved one like our houses, to the mobile one like our cars, and the social one with school, university,

administration full of asbestos ». As we have seen, infection and the nature of insidious pollutions that cannot be managed are worrying because of the feeling of fatality, terror or denial that they entail, as if we couldn't escape from them or protect ourselves.

II/ « AIRPOCALYPSE » IN CHINA

An extreme situation

A word was invented to talk about radical air pollution : « Airpocalypse ». It is the most often used to qualify the situation of China. In this country, air pollution is not insidious. There is most of the time a smog covering the big cities, people cannot even see the blue sky and they have to wear a mask each time they go outside. How have they got to this point?

The Industrial Revolution is very recent in China. Whereas the first Industrial Revolution started almost a couple of centuries ago in Europe, it really started about 40 years ago in China. They have had to deal , in a very short time, with accelerated modernity, which has nothing to do with their conception of life. The Western World has exported a way of living that doesn't match with the conception of life of the Chinese. China defined itself as « everything that is under the sky », but today they don't even see it. Because of the intrusion of the Western World, the country has had to slowly give up Confucian ideas. This philosopher conducted for a long time the Chinese civilisation to look for a vital balance with Nature. They suddenly moved away from it by massively industrialising their country.

Today, China is known to be the "Workshop of the world ». Pollution is admitted and the mask business is thriving. The whole

pollution business occupies a large part of the Chinese economy. Indeed, as the air pollution is not insidious, everyone can see the danger so, paradoxically, it is obvious that you have to protect yourself. In a sense, this pollution creates business. We can see it as an phenomenon of externality. Pollution is harmful but it generates jobs though. Can we consider this business positive on the Chinese economy?

The Government of China tries to fight against air pollution at a large scale. Some factories have been forbidden to work in winter, when the atmosphere pollution is higher, the European Union cannot send its wastes to China anymore for them to be recycled. Coal mines have been closed in big cities, millions of families have had to change their boilers without any other option but to choose a gas boiler. To cut a long story short, China has been trying to combine growth and sustainable development by including all the actors that are concerned. Most of the big decisions are political without leaving a lot of space for individual initiatives, including design. The fight against pollution is almost transformed into propaganda. In a Chinese TV commercial distributed by WildAid, an NGO, we can see people with hairs in their nostrils. Viewers are explained that they have mutated after surviving the pollution age. Their moustache acts as a filtration system. The slogan

says : « Change air pollution before it changes you ». So communication also has its place in the fight against pollution, complementing the policy of the Government. But what solution can Chinese people really apply in their daily life? Who will propose solutions to depollute and avoid air pollution? Option for Design seems to be one of the coherent choices in order to combine political, economical and technological aspects for a comprehensive answer.

Nonsensical solutions

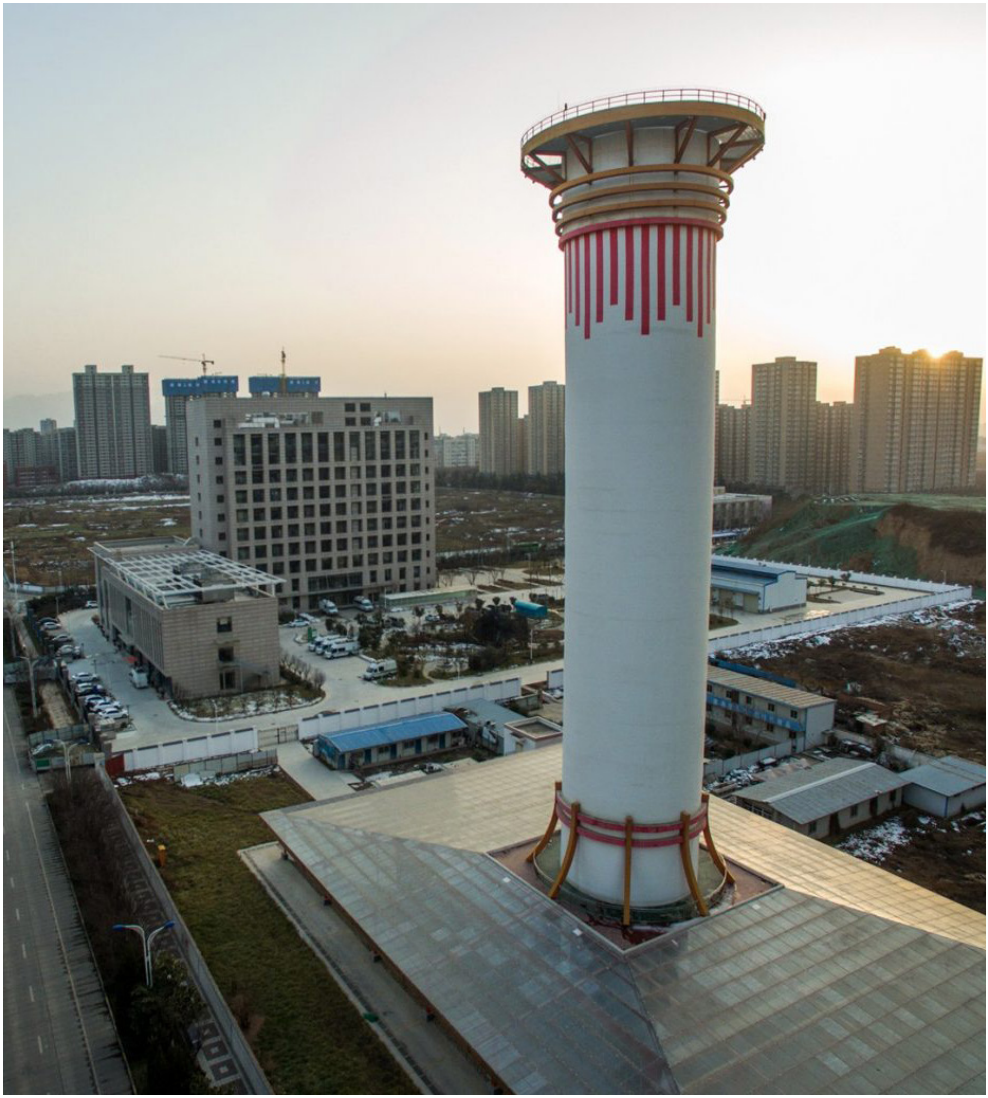
On 13th of March 2014, the Chinese prime minister Li Keqiang declared war on air pollution, in order to « make the sky blue again ». He wants to fight their own development model and their unsustainable and inefficient way of life. The Government of China take this situation really seriously and use their authority and influence on industrialists and inhabitants to reduce air pollution. They use all means to try to reduce the high rate of fine particles released by cars, factories and other sources.

When the Chinese Government said they wanted to clean the air, they meant it in a literal sense. In the city of Xian, in Northern China, a 100 meter high purification tower was built.

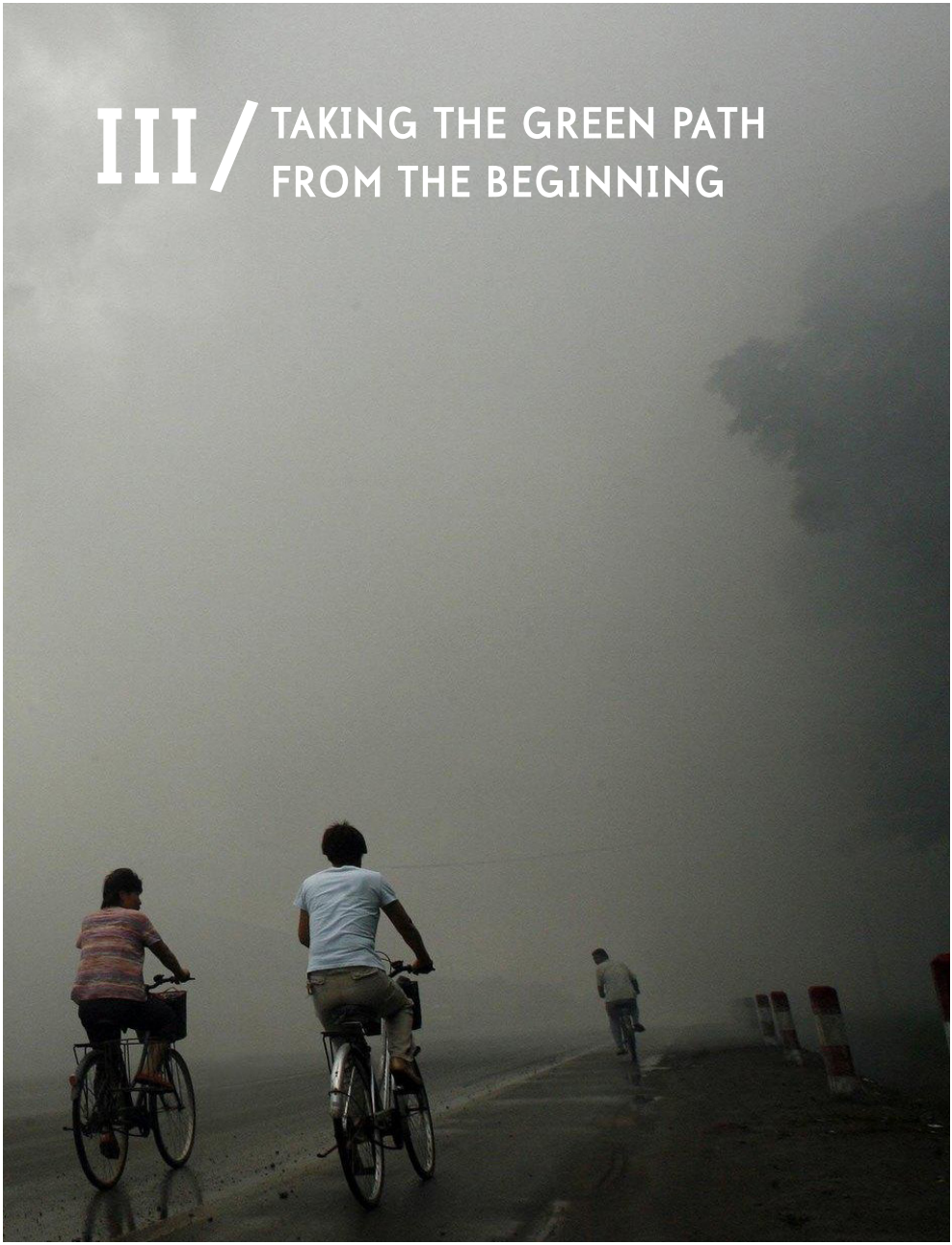
Its goal is to depollute the air. It was designed by Junji Cao, research worker of the Chinese Academy of Sciences and expert in atmospherical chemistry, and is not supposed to consume a lot of energy. The polluted air goes into the tower and when it gets out, the particles contained in this air have been stuck up in a filtration system. What is better than a very elaborate building to avoid Airpocalypse? The tower can purify 10 million cubic meters per day. Its benefits would be felt from 10 kilometres around. So if we can just erase the pollution in the air, why even try to reduce it at the source? This answer is not coherent with what the Prime Minister said. He wants to develop a sustainable industry and they just filtrate the air with a whole tower. We can think it is a disproportionate building to only filtrate pollution in the atmosphere. But the installation is only a prototype on a reduced scale of the definitive system. Indeed, the final project is meant to measure 500 meters high. This installation should purify the air up to 30 kms around. The authorities say this technology means hope but maybe a solution should be found not to produce such pollution instead of building a new architecture.

Shouldn't Chinese people limit polluting emissions by stopping using cars? A car manufacturer proposes a purifying system to have a clean air in the passenger compartment.

To sum up, you drive and emit pollution, nevertheless you can breathe pure air in your car. As long as the driver is protected, it doesn't matter if he creates air pollution. The president of the company explains that « inside a Volvo, we breathe as if we were in Scandinavia and as soon as we open the car door we find the air of Beijing ». Nissan also proposes a filtration system that makes you breathe a forest smell in your car. All these technologies are clearly marketing strategies and don't solve the air pollution problem. Beyond the absurdity of cleaning the air in your passenger compartment, produced by the car you are actually driving, these technologies seem to highlight a recurrent problem in the fight against air pollution by our industrialised society. We don't know how to fight the problems created by the industry without introducing new manufactured products.



III / TAKING THE GREEN PATH FROM THE BEGINNING



Not introducing a technical object and an immediate answer

Indoor air purifiers have never been so trendy in China. As everybody wants to protect themselves against indoor air pollution, the first solution they have found is to build an object to filtrate polluted air. This is a logical answer coming from an industrialised society. In China, indoor air purifiers are about to become as essential as a fridge. Nowadays, almost half of the Chinese population own one. This reaction is due to a question of timing. They are in danger and want an immediate response to their pollution problems. We do the same thing in France. Instead of finding sustainable solution to automobile carbon emissions, we turn down the speed limitation on ring roads when the air pollution rate is too high. We have to fix the problem right now. But maybe there are two different levels of action that can be managed simultaneously : an immediate solution and a more sustainable one .

Earlier, we talked about the collective unconscious dictated by industrialisation. It means that today the only answer we give to a technical problem is a technical response. But sooner or later, this other object will probably create another problem that will have to be corrected too. In the end, we have an

accumulation of correcting systems (stacking upon each other) that never fix the original problem. Why not avoid the need for corrections at the beginning of a project? Philippe Rahm is an architect that thinks differently. He thinks that the basic issues of air and temperature generate new interior landscapes, as second nature, geological, vegetal, atmospheric. It means that, instead of correcting problems, he wants to anticipate on them. You don't need to heat the living room if it is situated upstairs and the roof is properly isolated. Warm air rises and cold air goes down. Philippe Rahm proposes to distribute rooms according to their function and to these technical data. His goal is to avoid remedying systems like air conditioners. The indivisible flows are very important to him, that's why he said that : « if the smart materials are often in the visible, we would enhance the work on the invisible, the climatic and the thermal quality of the air ». This quotation summarises his wish to avoid absurd situations in projects that were not designed with an overall vision. If indoor air pollution can be considered as an invisible flow, it means that they maybe can be avoided during the building of architectures and the choose of furnitures. What is invisible in houses is at least as important as their enveloppe. He tries to bring a new vision of the traditional building.

In the case of China, why not try to anticipate problems before they occur? If energy

is going to be a problem in a few years, maybe they should produce some green energy from the beginning as long as their Power Park in not completely developed. Instead of making an energetic transition, they should assess their needs for green electricity, gas, matter... So they would give sensible answers instead of expedients and maybe have a much healthier economic model. By wasting less time finding remedies they would be more efficient. Sometimes, the more obvious and simple the solutions are, the better.

Remaining on stewardship

Before the invention of air purifiers, occupants, most of the time women that would not work, would open windows everyday to renew indoor air. Occupants were in charge of their homes and its health. They valued stewardship, they were literally « guardians of the house ». Stewardship is the responsibility of looking after one's property. Thus, people would avoid problems of pollution and dampness in their houses because they maintained a wholesome air. Design should give the key to users to take care of their homes by themselves, without using a device that tells you what you have to do. The concept of stewardship encapsulates the idea of responsibility. Solving our pollution problem with appliances doesn't make us more responsible.

Moreover, we can easily avoid using these systems with the same result. Sometimes it is better to apply simple gestures than use an expedient technical system that cannot even be as efficient. Can design prove to be relevant proposing a new manufactured product or leading users toward stewardship and a self-management of pollutions? What if his role was not to propose a way of depolluting but to generate new behaviours about insidious pollutions that need to be tackled differently. Maybe the best way to get rid of such pollutions on the long term is to directly involve users in the process so that they can act on their own without needing any product.

With stewardship we have to ask ourselves fundamental questions that are obvious and are based on common sense. By asking these kinds of questions, we would certainly avoid nonsensical products. Why should we buy air purifiers when we can simply open our windows to renew the air? As design is at the beginning of the production chain, designers have a role to play when they imagine a product. First, they have to wonder if there introducing a new product is really necessary, then they should think about common sense questions. For example, if I want to pack an object to sell it, what is going to happen to thE packaging in the end? A basic but essential issue. So stewardship relies on common sense. Is it a way of not using design? Or can design play a role in the implementation of stewardship? If

it can, how? We might need a product to help implementing stewardship. Maybe design is a link between common sense and users.

CONCLUSION

The case of China opens a new way of thinking. Why if they had been taking the green path from the beginning? And so do us? Design could have anticipated it if it hasn't been in such an industrialised and consumerist logic. It is a naturel response for us to create a new product to answer what we see as a problem or a lack of something. As China illustrates an alarming situation, we might transfer in our own country its mistakes due to the invasion of the Western World and a matter of time. The fight against insidious pollutions has to be engaged in order to avoid them at the root as long as we still have time to change. Thinking about consequences before it is too late is a matter of common sense. As design take into account a lot of parameters and actors such as economy, technology, politics or social, it plays a role of coordinating a lot of informations and point of view to anticipate the future. According to Sophie Fétro, their is no eco-design, because design should already take care of the environment. She calls this phenomenon tautology. Design is about changing behaviours not creating a new product at all costs. We have to reconsider what we already have and how we could act before introducing a new manufactured object.

BIBLIOGRAPHY

Plastic Planet: la face cachée des matières synthétiques. Actes Sud, Arles, 2010.

https://www.latribune.fr/entreprises-finance/industrie/energie-environnement/pollution-de-l-air-interieur-un-danger-meconnu-un-marche-croissant-600135.html

http://www.philipperahm.com/data/projects/deterritorializedmilieus/index-f.html
Philippe Rahm

https://www.sciencesetavenir.fr/nature-environnement/pollution/pollution-en-chine-une-tour-de-100-metres-pour-epurer-l-air_120268

https://www.20minutes.fr/planete/1360557-20140425-20140425-chine-pollution-air-combat-aussi-voitures

https://www.futura-sciences.com/maison/actualites/batiment-purificateurs-air-il-faut-mefier-53511/

https://www.paruvendu.fr/auto-moto/1/Volvo-s-attaque-a-la-pollution-a-bord-de-ses-vehicules-en-Chine-i34280

http://www.bfmtv.com/mediaplayer/video/l-etonnante-publicite-chinoise-pour-lutter-contre-la-pollution-768427.html

http://www.rtl.fr/actu/debats-societe/pollution-les-chinois-respirent-enfin-mieux-7791686021
(mesures prises par le gouvernement)

https://www.francetvinfo.fr/monde/asie/pollution-en-chine/le-premier-ministre-chinois-declare-une-guerre-sans-merci-pour-preserver-le-ciel-bleu_2082051.html

http://www.lemonde.fr/idees/article/2017/01/24/nuit-des-idees-anne-cheng-et-si-la-chine-se-souvenait-du-ciel_5068454_3232.html