

Price per Breath

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In this paper, we discuss the commercialization of air and present fictitious products to speculate about the different kinds of consequences that will emerge when or if 'commercial air' becomes reality. As we present how profitable it would be to invest in such systems in the coming future, our aim is to bring into attention not only future corporate interests but also what can be done to prepare the ground for counter reactions. We would like to call to attention modern civic responsibilities towards clean air practices as we encourage citizens to enjoy the last bits of 'free air' we have today.

1.0 Introduction

'Price per breath' (PpB) is an art project that promotes a fictitious company merchandizing air products of the future where the production of clean air is highly controlled and commercialized. As fictitious company representatives we ask:

Imagine living in a city where air quality monitoring systems dynamically price the value of air per human breath and show us how much we breathe every minute, hour or day and at what cost. Is clean air cheaper on a Sunday morning in Seattle, than on a Tuesday afternoon in downtown Portland? How much would we pay for clean 'branded air' experiences if they are available as off-the-shelf products? Should they be marketed with the same price everywhere? Are there any promotions for developing countries? By visualizing the local air pollution in the city, can we see where it is safe to breathe now and where it will not be safe in two hours? What would it feel like to live in a city where a real-time air-quality map dynamically segregates the urban landscape before the air consumer's eyes? Does this distort the way we 'perceive' pollution without its effects? How does it affect the market price of residential areas? Will you tell your cab driver to avoid driving through certain streets even if you can safely breathe inside the car? What would

your toddler or grandpa pick from a variety of flavored ‘clean-air backpacks,’ as it becomes vital for them to take even a 15-minute walk from the metro station to the bus? Oak mist? Morning dew? Rainbow?

As artists, on the other hand, we fundamentally ask what it means to live in a society with highly commercialized natural resources; what are their social, cultural and economical implications as if they are already in the market? PpB products intend to show the implications of what will happen if we carry over our existing line of thinking and illustrate a future urban landscape with these next-generation air products. These are products specifically designed for cities that realize cleaning the air with little tax money is not as profitable as buying commercial clean air products and services. For those who do not mind paying a little extra for a healthier and comfortable outdoors experience, this is even ‘premium service,’ customized, stylized and served for our ‘ultimate convenience!’

With our dual personalities, we participate in art events, gallery exhibitions, trade shows, product demonstrations and public performances to present PpB products as prototypes in videos, print and online media. The goal is to raise awareness not only to the increasing commoditization of nature, and how profitable it is, but also what is possible to do today to avoid this very likely future to happen. And if this is an unavoidable reality, then what are the best ways to respond to it?

The paper is organized as follows: After introducing the PpB products, we discuss the social, cultural and political context that gave birth to the commercialization of natural resources and its further implications for the emergence of new forms of ‘control’ within the urban environment. The paper proceeds by asking what can be done today to raise awareness about these problems and conclude by identifying possible ways to prevent such highly probable futures to happen.

2.0 Price per Breath (PpB) Products

‘Price per breath’ demonstrates the following next-generation air products:

- Pure-air-walk[®] (urban infrastructure design)
- Pure-air-cabins[®] (clean-air solution for outdoor locations)
- Air-now[®] (real-time air monitoring and visualization software with individual and enterprise level solutions)
- Air-pack[®] (portable air solutions)
- Dynamic Air Pricing
- Breathing-based Identification and Surveillance

2.1. Pure-air-walk[®]

Pure-air-walk[®] proposes a network of clean air paths overlaid on top of the pedestrian traffic infrastructure. Pure-air-walk[®]s consist of a series of transparent air cleaning units that are attached to each other in different geometries to form tunnel-like passageways. The transparent units intend to provide a minimally invasive setting where users can walk inside the tunnels and still be part of the urban experience, stroll around, and do window shopping without suffering from the poor air quality. Pure-walk-units are equipped with a

custom clean air pumping system that utilizes a dynamic pricing scheme, which calculates the cost of the fresh air experience based on current demand and real-time pollution.



Figure 1. Pure-walk-unit scenario. Image render: Huei-Sheng Yu.

2.2. Pure-air-cabins[®]

As the need for public telephones is decreasing, existing phone booths are upgraded to single-person air cabins to be used for high-quality, fresh and branded-air at polluted outdoor locations. The cabins are equipped with real-time air quality monitoring and visualization system that broadcast the local pollution levels via LCD screens. A user-friendly interface allows the users to browse the particle counts of the current air and project the level of pollution for different times of the day with. Users can plan their paths in the city by estimating how long it will take for them to arrive from one cabin to another on their way home or work.

Special edition cabins also provide different flavors, augmented either with smells or chemicals, for rich and immersive air experiences. Users can purchase instant-air[®], pre-paid gift cards for their different flavors (e.g., spring air, fruity air, etc.)



Figure 2. Pure-air-cabin scenario. Image render: Huei-Sheng Yu.

2.3. Air-now[®]

Air-now[®] is an award-winning real-time air monitoring and visualization software that forms the basis of most of the services in PpB products. The air quality of the city is measured in real-time from a number of mobile and stationary sensing units for 25 factors ranging from CO, CO₂, SO₂, to particle-level measurements that form the basis of a rating and ranking system. Users access the information via their mobile, web or personal media devices as a subscription-based service or view it from the displays presented in air paths and cabins.

2.4. Dynamic Air Pricing

In PpB products, the cost of each breath is not only based on its ingredients (e.g., chemical composition, flavor, etc.) but also the current pollution level of a given location, the current demand for clean air (how frequently one breathes) and the amount of people who shares the same location. As air is dynamically priced, the system allows ‘air customers’ save money by regulating their behaviors (e.g., calming down, breathing slowly, etc.) or by altering their locations such as avoiding dense urban areas. Dynamic pricing schemes allow us to sell customized air services for individuals, groups, enterprise or urban level solutions.

2.5. Breathing-based Identification and Surveillance[®] (BBIS)

BBIS is a brand new, patent-pending technology that allows us to identify “breath-signatures” based on advanced signal processing and computation methods that are used to identify people in public indoor spaces. BBIS is a minimally intrusive and doesn’t require any external marker or identifier (e.g., RFID, QR Codes, etc.). It is virtually undetectable in

public unlike camera and microphone-based solutions. We believe that our custom breath signature extraction techniques set a new standard in biometric data collection and analysis based surveillance techniques for public security applications.

3.0 Where do PpB products come from?

3.1. Commercialization

It is easier and more profitable to sell natural resources than to sanitize and make them available for free. Water was once a vast and free resource. Only twenty years ago in Turkey, one would come across public fountains and could drink the nice cold water coming from the mountains without a second thought. Today the fountains are either polluted or dried up because the springs are privatized. Water companies pump majority of the water to fill large numbers of plastic bottles (two billion liters per year), selling these bottles of water back to the public (Sabah, 2007). For example, Coca-Cola Company owns one of the largest springs in Sapanca, Turkey. The company bottles the water of the region and sells it back in the Turkish market. Public resources are polluted because the surrounding industries dump their waste, mostly illegally, into not-yet privatized water supplies.

PpB fundamentally questions the idea of ownership: what is the process that turns natural resources into profitable merchandise? Who makes these decisions, and who takes the responsibility for the consequences of these decisions, their impact on the landscape, and on people? Water is a well-discussed example. There are documentaries, films, and art projects arguing how wrong it is to make profit out of something that is an essential human necessity. We believe air is another endangered resource that will be highly commercialized not because of its immediate profitability but due to our inherent ignorance about not protecting our rights and our environment.

Natural gas is another similar story. Russia owns the largest gas reserves in the world. Many European countries depend on Russian gas. Whenever there is a price conflict between Russia and Ukraine, “a key energy transit state for producers in Russia and Central Asia to European consumers”, people in such countries will either spend their winters in the cold due to unaffordable prices, or use alternative solutions to stay warm (Ariel and Graham, 2009). The alternatives might be more affordable but not environmental friendly, such as coal. In countries like Turkey, municipalities give out plenty of cheap, contraband coal to low-income families; allegedly to help, but mainly to gain support and ultimately votes before coming elections (Anatolian Agency, 2009).

On the other hand, as human beings, we usually have the tendency to think short-term and assume that the world’s resources are infinitely renewable. When the first gasoline-powered vehicle was invented in 1875, people probably didn’t imagine that one hundred years later countries would go to war in order to secure the remaining oil reserves. When water was first bottled and marketed as a luxury product in 1583 in Belgium, one would not imagine that “a significant portion of freshwater resources would have become unusable” (Medalye and Hubbart, 2008) in the future, with the tap water in many countries contaminated and un-drinkable, and therefore, bottled water would become a ubiquitous part of the daily life, being far from luxury. Finally, oxygen products have started to bloom

since 2007. Inventors of those products are not saying that the air surrounding us might become un-breathable one day: portable personal flavored O₂ dispensers, oxygen drops, and oxygen bars, are peculiar products invented not out of necessity – not as solutions to pollution, but more of a marketing extravaganza. They serve as detox products, energy boosters for night-long parties, etc...

1.2. The City

Downtown neighborhoods are usually the most polluted regions of cities. Surrounding commercial centers, neighboring residential areas, high numbers of public and private transportation, and lack of enough green areas, contribute to air pollution. In the US starting from the 1950's, we observe migration from downtowns to suburbia. People who wanted to avoid the chaos of city centers moved outside of the city boundaries. People chose to live in the suburbs, where there is a better habitat and more space for bigger houses. The economy, particularly low gas prices, endorsed this comfortable life style; people could easily commute to work downtown and live in the suburbs. In developing countries, for example Turkey, the suburban life-style is rather a newer concept. The construction companies are in a race building condominiums outside the city centers. It's always the same marketing strategy: A healthier living space away from the stresses of the city.

However, with the weakened economy, the suburban life style is becoming unaffordable and less desired. The 9/11 phenomenon, the invasion of Iraq and the recent stock market and mortgage crises and the rumor of oil-reserves coming to an end have had a huge impact on the gas and housing prices, thus affecting the suburban commuter. We believe counter-migration is expected. Construction companies are already taking action, renovating the abandoned industrial buildings in rust-belt cities into expensive loft apartments and converting garbage dumps into green parks. A large scale decorating project is taking place at the moment to attract the upper-middle class suburban families to move into these luxury condos flourishing in once abandoned downtown areas.

Are downtowns – already struggling with air pollution – ready for a population increase? The answer is no. We already observe a selective removal process within the urban landscape. In order to be able to accept new residents, cities 'purify' their existing populace by forcing the poor to move out. In most cities, homeless citizens are losing access to open to public places. In the name of crime prevention there is a high growth of video surveillance in public parks and on street corners. Most of public parks are closed to the public at night. Many US cities have ordinances criminalizing laying, or sleeping on public property. Furthermore, these new classy apartment complexes raise the cost of living, attracting expensive stores and high-end grocery markets into the area, thus making life for lower middle-class families unaffordable as well (Carlsson, 2008).

Nevertheless, even though the population demographic changes as the rich replace the poor, air pollution will remain a constantly increasing problem. We believe, Pure-air-walk[®] and Pure-air-cabins[®] will be vital elements of the urban landscape. The luxurious lifestyle will not be complete without these exclusive roads built with transparent walls within the urban landscape. Our products might attract criticism at the beginning but, before long,

people will get used to them. Eventually, they will not be perceived as peculiar, or luxurious.

1.3. Control

Security in public places has been an on-going concern. New technologies are always adopted for enhancing the quality and efficiency of surveillance. With PpB products, we not only discuss the design and use of new technologies, but also discuss their political implications and the ways they transform the perception of control in public places.

The Pure-air-walk[®] system proposes a new pedestrian infrastructure that connects the streets to each other with over-the-ground paths. Inside these paths, the air is purified and served as a commercial product. Pure-air-walk[®] recognizes customers via Radio-frequency identification (RFID) chips inside their pre-paid cards. Similar to IP addresses that uniquely identifies each computer on the Internet, every card is given a unique number so the system keeps track of each individual: where they enter the tunnel, how much time they spend inside and at what location they leave. The system can thus monitor pedestrian traffic. The data gathered from the daily activity of the inhabitants can be used to profile people. This information can be used not only for security purposes but also mined for commercial applications. For example, the data concerning how long one spends at a storefront can be a valuable investment for not only advertising companies, but also urban developers who would be willing to dynamically price the value of their street.

PpB identification and surveillance products are equipped with sensors that can measure breathing patterns. The breathing irregularity detection of an already known customer would allow the system to alert 911 and seek medical help. A thorough breathing signature analysis, on the other hand, correlated with real-time information from crime databases, can classify if this is a regular anxiety or a sign of suspicious activity. As the system informs the authorities, if the suspicious pedestrian is within a cabin, using air-walk system, or using one of the mobile air product, he/she can easily be tracked with his/her exact whereabouts and monitored until he/she leaves the system.

Agnes Heller defines home as “geographical monogamy” and travel as “geographical promiscuity” (Morley, 2000). PpB products will undeniably affect urban mobility patterns. People who often do not want to leave their usual neighborhoods due to being afraid of violence and illegal activities will have a newer criterion to avoid travelling to other places. We suggest that this would be a new kind of dynamic segregation that will negatively influence the “heterogeneous mixing” of urban residents based on current pollution and particle levels, leading to more geographically monogamous residents. As new ‘threat’ zones emerge from the patterns rendered PpB visualizations, it would not be hard to imagine why parents would not be willing to send their children to the neighborhoods, where the average dust, pollen and other particle levels fall behind PpB limits.

Representation of air quality patterns will not only transform our immediate experience of our cities, but also shape our long-term views about the quality of living in particular neighborhoods. The cost of residential areas would not only reflect the proximity to immigrant or working class neighbourhoods, but also the distance to the nearest Pure-air-walk[®] entry points or the number of Pure-air-cabin[®] machines deployed on the block

4.0 PpB Product Demonstration

PpB products are introduced in a number of venues. The first installment of this project will be a Pure-air-cabin[®]. The cabin will be exhibited at the Emerging Media Invitational, an exhibition organized by University at Buffalo Art Galleries in 2010.

Like a typical tradeshow showroom, the installation will consist of product demonstrations and an information booth where we feature videos of selected products. Here, as artists, we will perform as if we are sales representatives of Pure-air Co. and engage with the audience in a number of ways to inform them about the company and its products.

5.0 Conclusion

The PpB project provides us with two parallel identities: First, as fictitious company representatives who celebrate the commercializing of air in glory and describe the benefits of its merchandising via a number of next-generation products ranging from urban air paths, mobile air units, air cabins and flavored-air experiences. Secondly, as artists who aspire to raise awareness to the social, cultural and political implications of such thinking in order to identify the reasons of such commercialization to seek ways to prevent such futures from happening.

PpB products do not intend to find a place within post-apocalyptic scenarios of the near future. To the contrary, by demonstrating their very reality, we would like to highlight what type of user profile such products would expect. How much can they rely on passive consumers who would be willing to trade control over convenience, similar to the way we have traded public fountains for the bottled vitamin water experience?

As artists, we are hopeful that we can remind everyone about our current responsibilities towards the environment. There is still time for bottom-up approaches to urban community development where these very technologies that can be designed and commercialized by corporate interests can be reversed and utilized for community actions. If real-time air quality monitoring technology is on its way, it can be also be utilized for civic engagement that can work against mitigating the sources of the pollution (e.g., documenting corporate pollution, grass-roots traffic congestion management, etc.).

If breathing-based surveillance is on its way, it should also face its counter-technologists. Those who master the art of using the diaphragms should teach others how to breathe.

If we are going to live in urban settlements marked with air path infrastructures, valued with air cabin deployments, or vending machines that dispense over-priced mobile-air solutions, it will not only be due to greedy corporate interests that will sooner or later figure out how profitable this business is, but also due to our inherent ignorance about what we experience for free and abundantly from nature (so far).

Before we once again immerse ourselves into decreasing our CO₂ emissions, lowering our energy consumptions and recycling our water, the usual practices for sustainable living,

we can still enjoy a deep, fresh, unbranded breath and think a little more carefully about what we can do to keep it cleaner for future generations.

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