

Sustainability Innovation

A New Public-based Carbon Trade Model-A Case Study On Shared Bike In Transportation System In Wuhan, China

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Summary

It is universal acknowledged that the environmental issue is deteriorating which lead to huge financial loss. To solve the problem, our team designs a new Carbon emission trading system.

Our system is able to establish a won-won situation for user, citizens and businessman who take apart in our system. Meanwhile it involves some effects like reduction of carbon emission, promoting economy as well as energy conservation. Here are more detail to show how it work.

To start with, we set a standard for zero carbon credit. If a person buy something having lower carbon than the standard which means that the person could get certain carbon credit. Based on the carbon credit, the person could use it to exchange something. So he is willing to continue joining in the system and invite others to try since the benefits the system brings. As for the business, we have ample reason to believe they are pleased to do as well. Because not only can the system bring good fame to them, but also they are capable to increase the profit(although they decrease the price of production, the number of people buying is growing. In generally the profit is increasing). Consequently, the government could reduce the cost in environmental protection and spend more money inventing the education or something else so as to improve the average GDP.

To avoid the unfair proportion between carbon reduction and carbon credit, we design a general formula. It will be talked about in the other part.

By the way our system has an interlocking structure. In other words, the system can be used in any business. For example, a person get certain carbon credit from traffic, using it in retail like drinks. It is allowed. In some content, the system can lead to low carbon emission in all areas.

The attachment below is our essay about our new Carbon Trade Model. In this essay, we clearly describe this model, including how it derives,

 [Environthon.pdf](#)

Identify the Challenges

Cars could bring some benefits for people such as convenience. But it also pollute our air and damage our environment. There is a conflict between pros and cons of car. Actually people prefer to enjoy themselves rather than environmental protection since they think the protection have a little to do with their live. Then how to promote a great number of individuals taking part in the protection becomes an essential problem.

Identify a Root Cause

In Taiwan, there are bulletin boards stuck on the wall next to those trash bins. " Anyone who didn't follow the rule of garbage classification will be fined at least 1200-6000 NT\$. Until now, the average rate of garbage classification of Taiwan is 57%, one of the highest garbage classification rate in the world. As the example has showed, the government use punishment to encourage people to classify the garbage and get an great success. So our group wonder the main cause is that the government use money to prompt people' s activeness. So how to explore money is essential for environmental protection. Based on this, we add the financial effect in the solution for the challenges. But not the punishment because we deem that once the region of the solution become large, the punishment is difficult to manage. We contribute to let positive financial effect play a role in environmental protection.

Generate Solutions

Design a new carbon trade model which can act on individual. It is different from the traditional carbon trade model defined by Kyoto Protocol , which is limited by the country or some large companies. We focus on creating a new carbon trade model facing to the public and attracting people to take part in.

Communicating with the government to let it issue a law to punish person who destroy our environment .Publish policy to enforce individual to protect the environment.

Develop a WeChat mini program which can show the data of the total distance of a person' s displacement in a day and their contribution to the reduction of carbon emission. we can publish data to stimulate users. If they make contribution to the environmental protection , they will get a strong feeling of satisfaction. If they don' t, they will know that they need to pay attention to it and continue to reduce carbon emission.

Persuade governments or companies to increase costs of driving cars and decrease costs of riding bikes.

Reinforce the strength of the publicity to let people know that environmental protection need everybody' effort.Try to attract more and more people by public speech or advertisement.

Identify the Criteria

The number of individuals that would agree the solution and take apart in

The feasibility of the solution to exert on the individual.

The fund can be made sure that it is enough to support the solution

Could it solve the problem for a long time or just briefly

Could the solution get support from government

Evaluate the Solutions

Please see attachment

 [Evaluate the Solutions](#)

Make an Action Plan

Since our new model is based on both companies' and individuals' profits, we have to trace in 3 directions:

1. Facing to firms and professionals:

1.1 To find the manager from Mo-bike in Wuhan and contacted the other relevant person in charge, and introduce our carbon trading model to Mo-bike and further seek relevant data.

1.2 To contact Hello-bike and introduce our carbon trading model in detail. Reasons for 1.1-1.2 scheme: this model need closely cooperate with shared bike company, so the design of this model is required to adopt the company's advice and get supports.

1.3 To ask professor Qian Yan-min about our project, a professor of economics at Zhejiang university. Reasons for 1.3 scheme: this model designs an economic theory, consult economics professor to be able to make us gain support theoretically.

1.4 To consult the former director of the traffic engineering institute of Wuhan city construction college, Huazhong university of science and technology, and also the chief engineer of institute of road traffic engineering, school of communications, postgraduate supervisor of traffic engineering: Professor Zhao Xian-yao. Reasons for 1.4 scheme: this model is based on the transportation industry in Wuhan as an example, consulting professor Zhao can help our model to be more suitable for Wuhan transportation.

2. Facing to the public:

2.1 We will send questionnaires and conduct a 20-day survey with a target of at least 300 people. In order to make the survey more representative and diverse, we will not only send questionnaires to people gathered in subway stations, residential areas, shopping malls and other places, but also make online questionnaires and send them to QQ and WeChat groups with different themes, such as environmental protection group-chats, community residents group-chats, student groups and traffic information group-chats. Survey content: the recognition and understanding of the carbon trading model by the citizens in today's society. Goal: to survey people's recognition of original carbon trading model, and design a refined model which meet people's tastes.

2.2 We will select 20 volunteers from various situation and then simulate a tracing survey. We will contact them every day to collect a large amount of data and further improve our model. This step will be: volunteers will tell us the idea of choosing a vehicle every day, the time and distance of riding, and then we will act as the sharing bike company and give some rewards according to the new carbon trading model designed by us. Before and after the experiment, we will assemble their opinions of the carbon trade model. Goal: to help us design models that are public friendly, and enhance the measurability.

3. Reliability and Environmental Integrity

3.1 Measure carbon reduction by tracing users' transportation preferences through mega data.

3.2 Quarterly analysis, including survey on people's opinion and future improvement.

Prototype and Test

| Feedbacks learnt from users

This model takes Wuhan as an example, so the practice range is within Wuhan. However, the model is designed to target regions and groups of people across the country, to the extent that the model would improve citizens' environmental awareness and reduce carbon emissions.

Our plan has finished on time and even beyond:

1. We obtained the data by sending questionnaires to 176 members of the public (with a 100% collection rate), we get: about 80% of people are not aware of our model and even the model applied internationally (original), but over 90% of the public are willing to participate in this carbon trading activity.

We tracked down 20 volunteers for a week and investigated their satisfaction rate of our design of model before and after the pilot operation. The pilot went well, and the satisfaction increased from 40% to 80%. People were generally willing to actively participate in the carbon trading model. In spite of this, we create a satisfaction index with independent variable "i" (carbon value - RMB ratio). We can clearly see that the index will rise up as "i". Goal: this diagram will provide a reference for the future carbon trading companies. Furthermore, we've acquired some other information: (1) students and office workers are more willing to participate in this model and have a stronger awareness of environmental protection and social responsibility; (2) the higher i (carbon value - RMB ratio) is, the higher public participation will be.

3. Tracking survey shows that: before the experiment, 18% of the citizens use Shared bikes every day, 27% of the citizens often use Shared bikes; After the experiment, 40% of the citizens are willing to use Shared bikes every day, and 40% of the citizens often use Shared bikes, an increase of 22% and 13% respectively. Meanwhile, citizens' awareness of environmental protection has been improved. About 50% of citizens ride and share bicycles for the purpose of saving energy, reducing emissions and protecting the environment (see the figure at top).

4. Mo-bike and Hello-bike companies were very interested in our proposal and gave us some support, such as providing data and suggestions for improvement.

5. Professor Qian Yan-min and professor Zhao Xian-yao highly appreciate the carbon trading model designed by us and proposed Suggestions for us.

| Improvement for next iteration

3. Future Propaganda & Combination:

3.1 To make project-videos to publicize the scheme, and then send it to video websites.

3.2 To found a WeChat public account and website, and to further glean public's view and opinion, and boost our popularity.

3.3 Continue to consult professor Qian Yan-min and professor Zhao Xian-yao, and adopt the advices for sustainable development. Our project and content are really appreciated by professor Zhao, and he will offer to help us in future.

3.4 Continue to contact with the relevant sharing bicycle companies to carry out our model into real-life, and further combine it with the market, and collect opinions, finally we will use the data provided to further improve our model.

3.5 To conduct a larger social survey and apply it to society with data collected.

3.6 To contact with My Nanjing APP and the Nanjing municipal government for support.

Appendix

| Presentation File

 .ppt

| Team Credits

Gao Yuehuai is responsible for overall organization, the project idea, most of the experiments of the project, making PPT presented in the final presentation and team's speaker in the final presentation with another team member.

Song Yueshan is responsible for the advertisement of the project.

Wang Siyuean is responsible for searching background information.

Li Bairui is responsible for partially completing the project paper.

Guan Yesheng is responsible for the final presentation with a group member, project text, weekly meetings and experiment of the project.

Judge Comments

" General comment: What makes this research different is that it involves creative thinking on your side. Furthermore, you go the whole way from this idea to its adoption to the field of climate change, and then develop an economic model and a carbon-trading scheme. Well done!

Comment on the report: Behavioural change to reduce carbon emissions is identified as a major challenge. Under "root cause" , not as much the driver for this challenge is identified, but rather what made the group develop the carbon trading scheme at hand. As a solution to overcoming the behavioural change challenge, you want to address three actors: the government, the economic sector as well as citizens. Well done for pointing at the need to involve a variety of stakeholders in such a scheme! You identify criteria that shall assess the feasibility of carbon trading, which is also well done. Under "solutions" , you compare the solutions you identified before. It is not clear why you evaluate them because they all form part of your action plan. The action plan is comprehensive and at the same time remains focused on the goal to look into the feasibility of a carbon trading scheme. Well done! The feedback from users is foremost positive, - what could you learn from possible criticism? A lot of activities are listed for the steps ahead.

Comment on presentation: The motivation for this research is well introduced, as well as how the idea for a carbon-trading scheme came about. The introduction of the model was not as clear, but the remainder, i.e. how the idea was tested in practice, was well done. From the report, it seems that much more data was generated and could have been presented, - if not in the oral presentation, then at least as figures on the slides.

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" I applaud the team for tackling a challenging topic such as carbon trading systems and figuring out a way to apply it at the individual level.

It is also commendable that you chose a diverse set of people to engage as part of the surveys. The paper submitted along with the project also has done a good job of citations and references.

Creating an environmentally grounded tradable individual level reward market is a good start. I feel that the details of how the system works still needs to be thought through further. Here are some key questions to answer further – Who is paying for the credits if a user bikes? The government? Other individuals? If it is not the government, what incentive do other people have to pay? If it is the government, how long does the government subsidize good behavior?

I encourage your team to take this idea further as it is very promising and with the right tweaks could be successful in changing people' s behavior.

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