

# The Roles Which Environmental Psychology Can Play in Building Low Carbon City

环境心理学在建设低碳城市中的作为

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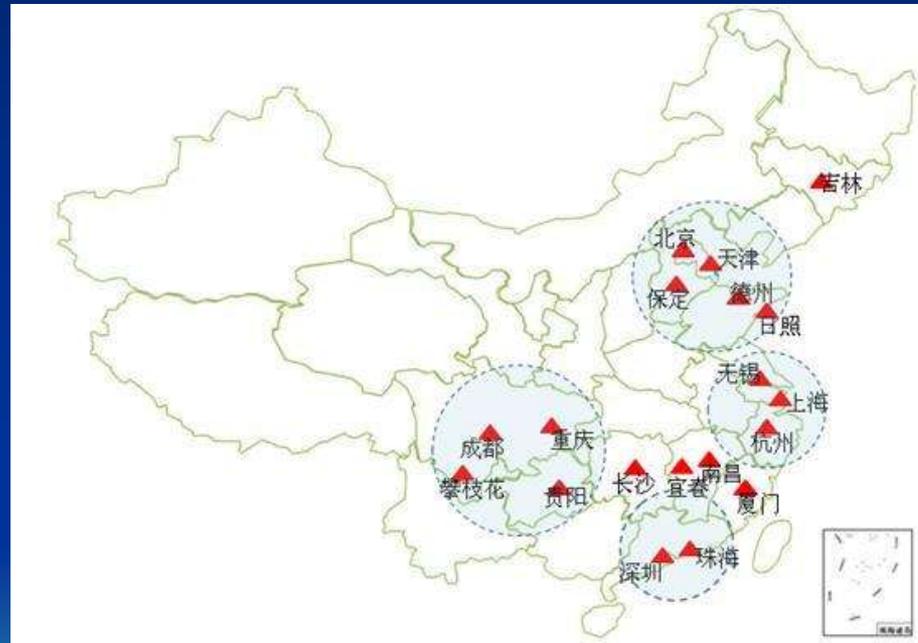
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- In December 2009, the World Environment and Climate Summit held in Denmark, all countries almost reach a consensus that human activities increased greenhouse gases (especially carbon dioxide) in the earth's atmosphere, the climate is changing.
- High levels of greenhouse gases to global warming will have a negative impact on human life. Since the end of the summit, countries all over the world make the greenhouse gas emission reduction and control commitment to the secretariat of The United Nations Framework Convention on Climate Change in 2020.



- As the great powers of carbon emissions, China will face high pressure to reduce the emissions. Therefore, carrying out a low carbon economy is considered the inevitable choice to avoid catastrophic climate change, and keep of sustainable development. In the government's level, "low carbon city" has won the consensus of the official, now has become one of the hottest development goals.



<http://www.ccidconsulting.com/ei/gdcy/jnhb/sdpl/webinfo/2011/11/1322443073607733.htm>

To build a low carbon city, we should solve two key problems:

- The first is to promote low-carbon technologies, reduce fossil energy consumption with high carbon, increase renewable energy consumption ratio. Reducing fossil energy consumption means reduced emissions. This is a technology road to low carbon cities.
- The second is to encourage and develop low carbon behavior; this is the behavior road to low carbon cities. Technologies are operated and used by people. Therefore, the human element in the process of a low carbon development is more important.



# What is Environmental Psychology?

- **Environmental Psychology** is an evolving field studying the relationship between humans and their environment. It is a behavioral science that investigates the interrelationships between the physical environment and human behavior.
- The true goal of Environmental Psychology is to bring improvement to the lives of human beings through ascertaining the good and the bad in our relationship to our environment.
- From the history of the discipline, it emphasized the study on environment impact on human being before, now it emphasizes the study on human impact on environment, especially on natural environment.



# Three respects:

1.Environmental Recognition: the subject can improve people's consciousness of low carbon.

2.Behavioral Intervention: all of cues, encouragement, punishment, and feedback can promote human low carbon behavior

3.Post Occupancy of Evaluation: in the respect of evaluation of low carbon design or policies, P.O.E. can be used effectively



# 1. Environmental psychology can promote people's environment cognition and improve the low carbon consciousness

- Environmental education is the main way to establish people good life style and right values. Environmental education can start from kindergarten through elementary school, high school, college as a series of formal education system. Now in China, the kindergarten, primary and middle school, have achieved good results by the activities of building green campus, many children do better than their parents in green life.



- Residents' environmental concerns present a significant growth trend with the level of education.
- In 2004, CAO Shixiong and other Chinese scholars did a survey to over 5000 respondents from different provinces and cities in China for the national environmental attitude. They found out that the percentage of respondents whose education degree following by the junior middle school considered the environment is degrading heavily were only 61.4%, compared with 96.4% of those whose degrees of university.



- In addition to formal education, some non-governmental organizations and volunteer groups play the supervision role, which are also very important.



- Therefore, there are many research topics such as:  
what should be put into environment education?  
how to update the content of environment education ?  
how to change people's environment cognition?  
, etc.
- Environmental psychologist can cooperate with government and NGO, try to promote people's low carbon consciousness, and choose low carbon way of life.



## 2. Environmental psychology: behavior intervention guide people to do low carbon behavior

- There are two kinds of behavior intervention: the antecedent + the subsequent
- The antecedent intervention mainly means the environment cue;
- The subsequent intervention is the reward, punishment and feedback.



## 2.1. Environmental Cues

- Environmental cues are direct intervention of environmental behavior. For example, water saving tips is posted in water places; in the public space power saving tips remind the last person who will leave the classroom, office, and other public places, turn off electric light and air conditioning. These cues seem simple, trivial, and cost not a lot, however, the energy conservation effect can not be ignored.



- Environment cues needs to be spread by the mass media such as TV, radio, or in place of the city public advertising, and the network media, newspapers, magazines, etc.



- In the use of low carbon building, the environment cues can also play an important role.
- Low carbon building design and construction is a professional work, but general users don't have professional knowledge of low carbon building, they need to learn how to use the low carbon buildings, especially for those passive design or new technology. In order to make these buildings work best, architects need not only to give occupants a manual of building operation, and building managers need to post instructions and attention on the necessary site. The users even need to be trained.
- Otherwise, for users don't know some passive energy saving measures, they may change the building layout, or do some interior transformation, and cause some ventilation path and thermal insulation measures fail.

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## 2.2. Reward, punishment and feedback

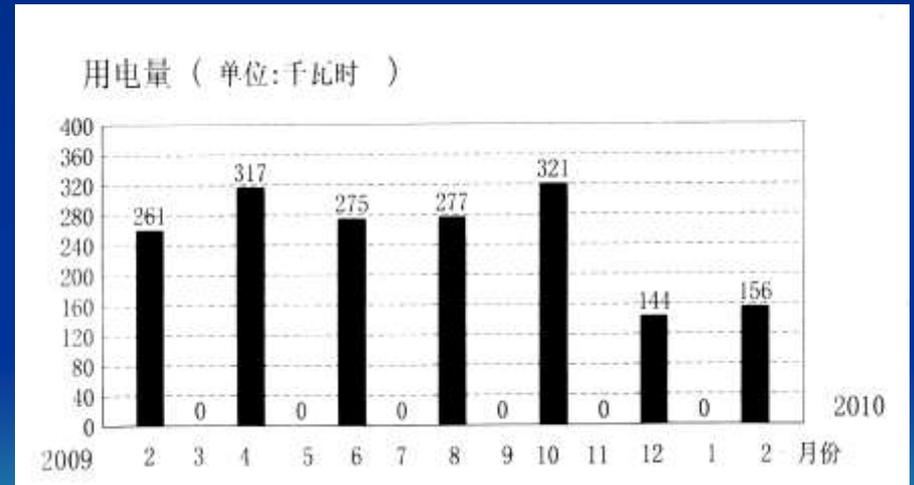
- The major alternatives of subsequent behavior intervention are reward, punishment and feedback.
- Reward, punishment is to establish the relative policy to induce human valuable behavior by economic means.
- In this respect, the government is the execution subject. For example, the government set the low price of electricity policy to encourage users to avoid rush hours; in water price, the ladder price system can improve cost of excess water; to lower public transportation fares, or one ticket police, encourage people to use public transport. These are many cities have implemented policies.



- In this respect, the feedback data of the user's energy is simple and convenient, which can help one understand oneself energy consumption in order to adjust their behavior patterns.
- American scholar research shows that, the more frequent feedbacks of consumption of resources, people tend to save more.
- For example, in 1992 Kaiser and his partners did a research on the use of recycled paper at campus, they discovered that if the weight of the recycled paper used the day before was released every day, recycling weight could increased the most to 76.7%.



- Many new cars are equip oil consumption display instrument, the fuel consumption feedback let drivers develop oil saving habits. For another example, Shenzhen Company of Southern Power Grid in China uses the bar chart to display a user's power data of every month in a year, which is intuitive and favorable for users to evaluate power consumption.



### **3. Post occupancy of evaluation (P.O.E.)- inspect the effect of low carbon policy, behavior and technology**

- P.O.E. is not only an important environmental design research method, it can also be used in all kinds of performance evaluation of policies and measures in actual life, and it uses systemic and precise method to evaluate the actual effect. In construction of low carbon cities, evaluation of the performance of energy saving and carbon emission reduction are regular practice. For some policies, such as performance of waste classification, percentage of renewable energy, downtown congestion charge and so on, can all tested by P.O.E.



- For the policy, planning and design, operation measures for low carbon cities, we can know their performance in actual use by P.O.E. Therefore, it can help us judge if the low carbon goal of planning and design is achieved, or figure out what the problem is, then make right decisions.
- Generally in building low carbon cities, environmental psychology as a cross discipline, whether in environmental cognition, or through the environmental cues, rewards and punishments policy to intervene in people's behavior, or to use P.O.E. to test the performance of low carbon policy, can play important roles.



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*THANK YOU!*

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