

**A Study Approach of the Utility of the Environment (UE) of the Public Companies on
NYSE, NASDAQ, and OTC Markets
—A foundation to create “UE stock index future contract” and “UE stock index investment funds”**

Dr. Wenyi Yu

Contact information:

Company: American Environmental Energy, Inc. (symbol: AEEI)

Website: <http://www.laei.com>

Mailing address: 14 Wall Street, Office 2090, New York, NY 10005

Email: wenyi.yu@laei.com

Office Phone: (212) 618-1315

Copyright reserved.

Our company will blaze a new trail in global environmental protection and new energy development by creating new environmental finance products.

The author presents an outline of the study philosophy here.

Concept 1. UE as an environmental variable (EV)

The utility of the environment (UE) refers to the value of the environment to human survival and development. It is an economic indicator and an economic concept, but it is politicized because it is related to public interests.

When only the environment and people exist on the earth, the impact of the company on the environment ≈ 0 ; When a company appears on the planet, that is, when a variable is added, the company changes the relationship between the environment and the human. The company affects the environment and then affects the survival and development of people.

Intuitively, the environment is a variable affected by the industry. We define it as an environmental variable (EV).

Because the environment can be changed, the people living in the environment will also be changed, which means human existence and development are also variables. We define it as a human health variable (HHV).

It is assumed:

1. when an enterprise optimizes the environment to human, $UE > 0$;
2. when the company hardly changes the relationship between the environment and people, $UE = 0$;
3. when a company changes the environment to cause harm to people, $UE < 0$.

Time (t) is an important variable, sometimes the response is rapid and violent, and sometimes the effect appears for a long time so that the short-term effect does not appear.

The impact of corporate behavior on the environment is not a new subject, but it is an extremely important and sustainable topic, and it has become an important part of government policies, financial study, and investment strategy.

As a representative company of the industries, a stock-listed public corporation has a major connection and responsibility with the environmental impact of human survival and development.

The purpose of the research of the paper is the utility of the environment (UE) of a public company listed on NYSE, NASDAQ, and OTC Markets.

Concept 2. UE

Definition.

UE refers to the impact of business product and/or service on environment.

The utility of the environment is concerned with the impact of the environment on the survival and development of the human being. It has a dual relationship with life and economic interests.

UE can be expressed as the change in the human life quality (HLQ) during a certain period (t) while the environmental quality (EQ) is changed. This is an intuitive assumption and a subjective theoretical concept to be verified. It is also a marginal concept in economics, which can be expressed as

$$UE = dHLQ/dEQt (t=0 \rightarrow \infty) \dots (1)$$

For example, the asbestos content in the air and lung cancer and respiratory diseases have a certain relationship.

The human life quality (HLQ) is mainly defined by the length of life (lifespan, LS) and the quality of living (QL). QL is measured by physical examination indicators (PEI) and psychological satisfaction (PS). It is expressed as follows:

$$HLQ = \{LS, PEI, PS\} \dots (2)$$

Environmental quality (EQ) is composed of chemical environment (CE), geographical environment (GE), climate environment (CE), and aesthetic environment (EE), which is:

$$EQ = \{CE, GE, CE, EE\} \dots (3)$$

Note:

CE -- The chemical environment includes the chemical components and their weights in air, soil, water, food, daily necessities, houses, workshops, offices, and public buildings;

GE -- There are two indicators for the geographical environment. One is the degree to which geography is beneficial or harmful to human survival (HS), such as landslides, volcanic eruptions, wildfires, etc.; the other is the degree to which geography is beneficial or harmful to human development (HD), such as the obstacles to human travel and industrial transportation. The unique geographical environment is suitable for tourist destinations and is beneficial to the development of tourism industry;

CE -- The climate environment has an impact on human survival and development. The rise of sea level, ice age, and hurricanes affect human survival; cold zone, temperate zone, subtropical and tropical zone affect the development of industry. Different latitudes have different industrial belt layouts. The climate environment is often a long-term, cyclical impact, with a time span of more than 100 years or longer.

EE -- The aesthetic environment mainly acts on human psychology. The relationship between human beings and the environment is mainly in survival, living, and career. The aesthetic environment is an important factor that affects the quality of human living, and it is also one of the decisive factors of industrial positioning. The aesthetic environment includes two parts: natural beauty (NE) and creative beauty (EC). Expressed as:

$$EE = \{NE, EC\} \dots (4)$$

The creative beauty includes the beauty created by people in nature and the artistic beauty created by people in studios and similar spaces, such as schools and homes. Landscaping is to create beauty in nature; oil paintings are created in the studio, or created outdoors and finally finished in the studio.

The aesthetic environment is an indicator that is difficult to measure, but it is generally valued. Perhaps the detection of brain waves can identify the strength and durability of the impact on the human body and the direction of behavioral changes.

Concept 3. UEB

The utility of the environment of business (UEB) is divided into three categories:

1. positive utility of the environment by business products and/or services (PUE);
2. Neutral (zero) utility of the environment by business products and/or services (ZUE);
3. negative utility of the environment by business products and/or services (NUE).

Therefore,

$$EU = \{PUE, ZUE, NUE\} \dots (5)$$

Business in the PUE includes:

1. PUE-P – business that manufactures PUE produces and/or distributes, such as LNG plant, solar panel plant, wind power equipment producer, R&D, and production of environmental protection material, Energy-saving product manufacturing;
2. PUE-S -- business provides PUE services, such as environmental information service, weather station; environmental education and training; environmental R&D, environmental development planning, environmental public policy consultation; environmental products exhibition, and conference sponsor and service; environmental projects construction; landscaping; ecological park, afforestation, desert control and similar environmental optimization projects; sewage treatment plant; environmental culture and arts; environmental protection foundation and financial services, etc.
3. PUE-D -- business supplies PUE produces and/or service, such as environmental products supplier and distributors, including online environmental services; independent environmental products/service stores.
4. PUE-C -- business that doesn't produce PUE products nor provide PUE service but donates in environmental protection or sponsor environmental events, which takes the realization of PUE as its social responsibility.

Business in the ZUE includes: Business that does not alter significantly the status of local ecology or macroscopic environment. Most business belongs to this category. For example, a CPA company or a law firm that rented a space in an office building and hired twenty employees, a garment factory that doesn't have the emission of three wastes; e-publishing; construction machinery assembly company, and pharmaceutical factories with very high air cleanliness and strict emission treatment, etc.

Business in the NUE includes: Almost all manufacturing and transportation industries have environmental pollution problems (industrial pollution) -- industry associated pollution (IAP), including factories that manufacture environmentally friendly products, but the degree of pollution is different so it does not become an industrial pollution issue. A semi-quantitative method can be used to classify industrial pollution into five categories: minor pollution, light pollution, moderate pollution, severe short-term pollution, and long-term pollution and are evaluated by 0 points, -1 points, -2 points, and -3 points, and -4 points, respectively. For example, paper mills can pollute to varying degrees due to the technical level of wastewater treatment.

The mining, smelting, and logging industries involve environmental damage, such as oil fields, gold mines, and metal smelting.

Agriculture that uses chemical fertilizers, pesticides, and herbicides on a large scale for long time is also an industry that pollutes the environment.

Some services are of environmental issues, such as a hospital that discharges polluted water and materials; the animal laboratory that does not process the waste completely before it is put out, etc.

Concept 4. UE Volume

The environmental impact of a product and service includes the breadth (EU-b), the depth or strength (EU-d) of the environmental effect and the time of the impact (EU-t), which together constitute the product's environmental impact dimensions – a UE volume (UEV). It is described as follows:

$$UEV = \{UE-b, UE-d, UE-t\} \dots (6)$$

In general, the environmental content of annual reports or related reports of listed companies can be characterized as +, 0, -, namely PUE, ZUE, and NUE.

The UE score formula

$$\begin{aligned} \text{Business UE score} &= \{\text{UE direction, environmental impact dimensions}\} \\ &= \{UED, UEV\} \dots (7) \end{aligned}$$

Parameter semi-quantitative description:

UED=Environmental direction =the UE attributes in the annual report or related reports, PUE is attributed to “+”; ZUE to “0”; NUE to “-”.

UEV =the multiples of the environmental impact dimensions (EID) =the product and service's environmental impact dimensions = {UE-b, UE-d, UE-t}, which has positive correlation with the market share and scale of the products and services. The dimensions are expressed by volume (UEV) as follows:

$$UEV=UE-b \times UE-d \times UE-t \dots (8)$$

For example, the environmental direction of a clean energy automobile manufacturing plant is +, its sales volume ranks first in the industry, and it has sold more than 500,000 vehicles distributed all over the world, and has strong R&D capabilities and market potential and industry-leading role, its UE-b can be scored 2 (the highest is 3 points, the lowest is -3 points), UE-d is scored 2, UE-t is scored 2, its UEV is $2 \times 2 \times 2 = 8$

If an enterprise has multiple environmental projects with different impacts, the cumulative method can be used to calculate the overall environmental score of the enterprise. See below:

$$\begin{aligned} \text{The UE score of a company with 2 or more environmental projects} &= \\ (UED1, UEV1) + (UED2, UEV2) + (UED3, UEV3) + \dots (UEDn, UEVn) & \\ = \dots (9) \end{aligned}$$

For example, an oil tanker company has polluted the coast due to a crude oil spill, but invested a lot of money to compensate, deal with sequelae correctly and in time, and optimize the environment in the future. These are two facts. Taking care of the future, including a more optimized environmental treatment plan and good results that can be expected, the company's environmental score may be positive and negative, and the overall score is zero, if the company's other projects have no NUE.

Concept 5. UE parameters in the annual report of public company

The annual reports or the president letters to the shareholders of listed companies are divided into two categories: the annual report with environmental report content, and the annual report without report content. Among them, the annual report with environmental report content is divided into three types -- with PUE, ZUE or NUE contents.

Keyword search related to UE (KWUE) in annual reports or the president letters to the shareholders of listed companies. It can be summarized as follows:

$$KWUE = \{UE-P, UE-S, UE-D, UE-C\} \dots (10)$$

Notes:

UE-P, a product that has the utility of environment, no matter the impact is positive, zero, or negative;

UE-S, a service that has the utility of environment, no matter the impact is positive, zero, or negative;

UE-D, a distributor or supplier that has the utility of environment, no matter the impact is positive, zero, or negative;

UE-C, a company that donates for the benefits of the environment and human health but its business has no relation to UE.

The UE credit of a public company. It is formulated as follows:

$$UE \text{ Credit} = + \dots (11)$$

Notes:

UE-item includes all items, projects, and programs that relates to UE in a public company in a certain period, as reported in the annual reports or the president letters to the shareholder;

UE-event includes all event and activities that relate to UE in a public company in a certain period, as reported in the annual reports or the president letters to the shareholder.

The assessment is the sum of the semi-quantitative scoring of the parameters.

While you make the assessment of the UE credit of a public company, please pay attention to:

1. The client scale of the company. The size of the company, the impact on the environment can be divided into four categories: micro impact, low impact, moderate impact, and high impact, with 1 point, 2 points, 3 points, and 4 points, respectively. For example, the sales scale of environmentally friendly products are large. The top three in the industry can be given 4 points; while the new product users are few, and the product that has not been generally accepted by the market, for which we assign 1 point...

2. The stage and the consequence of a project. The direction of the environmental impact of listed companies changes dynamically with time and the project they are involved in and the project period (in progress). For example, the construction industry will destroy the environment during the construction period of a project, but the impact on the environment after the completion of the project may be PUE, ZUE, or NUE. For example, (1) the planning and

construction of a nature reserve park are beneficial to the environment; (2) after the completion of a university campus, a large amount of domestic garbage and wastewater will have a negative impact on the region; (3) after a private house is built, continuous life pollution will be generated, but the degree is light.

3. The overall UE. At the same time, a public company may have both items with both PUE and NUE. For example, A high-tech company with mild NUE may donate to an environmental protection fund. If its PUE and NUE are almost equal, and the resulting environmental impact score is 0.

Therefore, in period t, the direction of UE is:

$$UE = d(PUE + NUE)/dt \dots (12)$$

Outlook: UE stock index

The United States Environmental Protection Agency (EPA) has established Environmental Finance Centers (EFC) across the country for regional services. Universities and companies also have their EFCs. Bank loans also take the UE into consideration. Environmental finance is not only a theory but also a practice. It has had an inspiring history.

Our research is a little different from the above works and peers in the area. The focus is to exhibit a general picture of the UE of businesses in NYSE, NASDAQ, and OTC Markets. Our orientation is the introduction of “UE stock indexes” covering the three security markets, as NASDAQ 100 index for NASDAQ markets. I believe the job will set a foundation for the creation of new financial products, including the development of 1. “UE stock index future contract” and 2. “UE stock index investment funds.”

The vision of the program is to provide one more choice for the investors and the financial sector, and presents the investment criterion other than EPS hence challenging the traditional investment philosophy.

Partnership opportunity

We welcome partners from The U.S. and around the world, including security exchanges, future commodity exchange, NGO in environmental protection, investors, financial research institutions, and universities.

Our “AEEI Environmental Finance Institute” enthusiastically invites colleagues from all over the world to join us, including professors, researchers, engineers, policy researchers, editors, government officials, investors, economists, mathematicians, and students in environmental protection, securities, and futures trading, future commodity contract R&D, investment funds, and other financial fields. Please send your information to info@laeei.com.

We need a 100-member team. Some of these members are volunteers and provide unpaid work. A few specific studies are paid.

Regardless of a free or paid partnership, we request your resume. If qualified, you are asked to sign an agreement with AEEI. AEEI will issue a letter of appointment to you.

Thanks for your comments in advance.

Wenyi Yu, Ph.D.

President of AEEI, Director of AEEI Environmental Finance Institute.

14 Wall Street, Office 2090, New York, NY 10005

June 19, 2021