2<sup>nd</sup> International Conference on

## **POLLUTION CONTROL AND SUSTAINABLE ENVIRONMENT**

October 05-06, 2017 London, UK

## Synergy of cleaner production and end-of-pipe treatment of production system

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Synergy is a new discipline that studies the common features of different things and their synergistic mechanisms which has already been used to transportation control, business management and greenhouse gas emission reduction and air pollutant control, etc. With the seriously environmental problems and the more stringent environmental standards, relying solely on the end-of-pipe treatment (EPT) of production system performance is increasingly inadequate. The production system can be devided into two subsystems, namely the Cleaner Production (CP) system and the End-of-Pipe Treatment (EPT) system determing respectively the pollutant production load ( $W_{pp}$ ) and the pollutant emission load ( $W_{ept}$ ), based on the systematic analysis. So the environmental performance of production system has changed from the single system benefit of EPT into the synergies benefits of CP and EPT. The assessment model of synergy of CP and EPT of production system was established under the hypothesis that the production system pollution discharge meet the requirements of the standard and consume the minimum energy. It shows that there is synergistic and optimal combination of CP and EPT. This study uses statistical correlation analysis from eight factors of influencing the CP level screening out three core and quantitative indicators such as purity of raw materials ( $\gamma$ ), raw material yield ( $\varepsilon$ ), and recycling rate ( $\eta$ ), while the pollutant removal efficiency (e) is the only factor of EPT. On the basis of material flow analysis (MFA), the difference of environmental performance of industrial production process under different combinations of four indicators was completed by scenario analysis method, using the above method to complete the case of recycled metal smelting industry.

## Biography

Yanping Li graduated from Peking University in 2005, is the Director of Department of Cleaner Production and Pollution Prevention of Chinese Research Academy of Environmental Sciences. His major research areas are co-control of CP & EPT, eco-industrial assessment, MFA and EMFA, etc. She has aresady published more than 30 articles and 5 books of pollution prevention and control of environmental pollution.

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