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LOW-CARBON MANUFACTURING DECISIONS CONSIDERING CARBON EMISSION TRADING AND GREEN TECHNOLOGY INPUT

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Abstract

From the perspective of Micro-Low-Carbon Economy, this paper studies the low-carbon manufacturing decision model of manufacturing enterprises considering carbon emission trading and green technology input under the carbon cap. The paper shows that the manufacturing enterprises have optimal output and this is unique under the carbon cap. The low-carbon manufacturing decision is addressed under three situations: carbon emission trading, green technology input and joint decision. The research shows that carbon emission trading brings more flexibility to manufacturing enterprises and enables enterprises to increase their profits, however, the maximum expected profit of manufacturing enterprises in carbon emission trading (higher than, equal to, or lower than the profit without carbon cap constraint) mainly depends on the carbon cap that initially granted by the government. The marginal cost per unit of carbon emission is the best evidence that manufacturing enterprise carries on carbon emission reduction technology, obtained after green technology input is lower than the price per unit of carbon emission in the market. The good effects of green technology input on reducing carbon emission per unit product is illustrated in more carbon dioxide reduction, so that the profits of enterprises will increase. Therefore, the enterprises will be more interested to input in carbon emission reduction technology.

Keywords: carbon emissions trading, green technology input, low-carbon manufacturing decision, random demand

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