Oil Drilling Problem

Oxenol Inc. owns land in a natural gas-rich area. Some companies in the area have carried out successful natural gas drills on their land, which they have successfully used commercially. Oxenol is therefore wondering whether to drill on its land.

The site itself has a value (price) for which it can be sold without difficulty, regardless of whether or not there is natural gas; if there is a natural gas, the land can be sold without any problems for greater sum without any further investment in the production and control facility.

Exploratory drilling to discover natural gas means an investment. In case a natural gas deposit is discovered, Oxenol can decide to make additional investment to buy the necessary production and control equipment.

The value of a drill equipped with production and control equipment will depend on level of natural gas prices. The company assesses 3 possible scenarios: price growth, price stagnation, price drop.

1. *Draw a decision tree.*

Now, suppose further that:

Oxenol owns land in a natural gas-rich area. Some companies in the area have carried out successful natural gas drills on their land, which they have successfully used commercially. Oxenol is therefore wondering whether to drill on its land.

The site itself has a value of $ 20,000 for which it can be sold without difficulty, regardless of whether or not there is natural gas; if there is a natural gas, the land can be sold without any problems for $ 60,000 without any further investment in the production and control facility.

The cost of exploratory drilling to discover natural gas is estimated at $ 40,000. In case a natural gas deposit is discovered, Oxenol can further invest $ 30,000 to buy the necessary production and control equipment.

At today's gas prices, a drill equipped with production and control equipment will have a value of $ 150,000. If natural gas prices drop by half, the drill will have a value of $ 75,000. But if the natural gas price doubles, the value will be $ 300,000.

The company assumes that the probability of success of the gas deposit disclosure is 30%. At the same time, the company believes that probability of doubling of natural gas prices is 40%, the price drop is 20%, and the price unchanged is 40%.

2. Solve the problem using the tree. What should the company do?