

## The Form of the Case

### Heat Pump (revised version)

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2. The Scenario	
<p>You are running the restructured branch of the bigger company which deliver the heat pumps to the market. You have to compete with other firms to meet the preferences of potential clients and to make the company profitable the same time. Game takes place on 2 markets - Poland and Germany. Companies are obligated to make decisions in following areas:</p> <ul style="list-style-type: none"> <li>- Establishing sales offices, setting marketing actions and product prices</li> <li>- Upgrading production lines, creating new products and modify existing ones.</li> <li>- Products manufacture and its transportation to the sales offices</li> <li>- Managing employees, setting salary policy, establishing trainings and extra benefits for workers.</li> </ul> <p>Game has 10 rounds, after each decision round players get feedback on the results of their virtual company.</p>	
3. The Company	
<p>GEDI SA Company has been a leading global supplier of technology and services in the areas of Industrial Technology and Consumer Goods for over 20 years. The Company was founded in Poznan, Poland in 1990 and today has 50 subsidiaries in 10 countries in Europe as well as Asia. The Production Facilities have been just installed in Hangzhou (China). The Company invests lot in modern technologies, which enabled to achieve a position a global technological leader in the industry.</p> <p>GEDI's green technology is the most environmentally friendly way to cool and heat your home. The systems which they offer, have no carbon dioxide emissions or any other negative effects on environment. With our performance we highly reduce greenhouse gas emission which are responsible for climate change. Our ground loop systems have a life expectancy over 40 years. The equipment is assembled with rigorous standards ensuring high efficiency during operation. We offer also a long time warranty for all products that are delivered and assembled by our staff.</p>	

Using our geothermal heat pump enables to save up to 65% on your energy bills for heating, cooling and hot water due to more efficiency when compared to conventional systems. Simple payback can occur in 5-7 years and you can experience costs savings just from the start.

Geothermal systems use the earth as a heat source and heat sink. In order to transfer heat to or from the house, heat exchangers (ground loops) are installed in the ground. These consist of high density polyethylene plastic pipes. The loops are then connected to the heat pump and fluid is circulated between them transferring the heat between the heat pump and the earth.

#### 4. The Product

A **geothermal heat pump, ground source heat pump (GSHP), or ground heat pump** is a central heating and/or cooling system that pumps heat to or from the ground. It uses the earth as a heat source (in the winter) or a heat sink (in the summer). This design takes advantage of the moderate temperatures in the ground to boost efficiency and reduce the operational costs of heating and cooling systems, and may be combined with solar heating to form a geosolar system with even greater efficiency.

The GEDI 1975 type is used mainly in commercial buildings or where space is limited. Vertical holes up to 100 m are drilled in the ground and a single loop of pipe with a U-yube at the bottom is installed. The borehole is then sealed with grout to ensure good contact with the soil. The vertical ground loops are then connected to a horizontal underground header pipe that carries fluid to the unit. The earth temperature is more stable farther below the surface which is an advantage of this system. GEDI 1975 can be located under the house and garden lots.

##### **Cooling mode:**

In the COOLING mode, the refrigerant, a hot gas, is pumped from the compressor to the water-to-refrigerant heat exchanger via the reversing valve. Water, generally with an antifreeze, flowing through the water-to-refrigerant heat exchanger removes heat and the hot gas condenses into a liquid. This liquid then flows through a metering device to the air-to-refrigerant heat exchanger coil. In evaporating into a gas, the liquid absorbs heat and cools and dehumidifies the air that passes over the coil surface. The cooling cycle is completed when the refrigerant flows as a low pressure gas through the reversing valve and back to the suction side of the compressor. The fluid from the water-to-refrigerant heat exchanger is pumped to the ground loop heat exchanger where it transfers the heat to the earth. The cooled fluid then flows back to the unit.

##### **Heating mode:**

During the HEATING mode, the refrigerant, a hot gas, is pumped from the compressor to the air-to-refrigerant heat exchanger coil via the reversing valve. In the air-to-refrigerant heat exchanger coil, the heat is removed by the air that passes over the coil surface, and the hot gas condenses into a liquid. The air is circulated to the space and provides heating for the house. The refrigerant liquid then flows through a metering system to the water-to-refrigerant heat exchanger. When evaporating into a gas, the liquid absorbs heat and cools the water. The heating cycle is completed when the refrigerant flows as a low pressure gas

through the reversing valve and back to the suction side of the compressor. In the winter the fluid in the ground loop extracts heat from the ground, raising the fluid temperature and circulates back to the heat pump into the house.

Geothermal heat pumps are very sophisticated machines and have many important aspects, but in the Strategic Management Game we decided to group those components which were shown above into 3 attributes:

- Ecology index (Eco)- indicates how environment-friendly are the components of the engine, how much power is needed.
- Technology index (Tech)- indicates amount of heat created, how advanced is the technology.
- Quality index (Quality)- indicates reliability, quality, and resistance to consumption.

## 5. Customers

Group name	Eco freaks					
Description	This group is represented by people who are very sensitive as far as the environmental issues are concerned. They are looking for very ecological solutions for their houses even when it is combined with high price.					
Preferences		Very low	Low	Medium	High	Very high
	Eco					X
	Tech			X		
	Quality				X	
	Price			X		
Group name	Big Fishes					
Description	Big Fishes are mostly corporate's representatives. They looking for ecological solutions which improve their image as a environment's friends. They do not care about price of the product. As located mostly in city centers, looking for systems which do not require much space to be installed.					
Preferences		Very low	Low	Medium	High	Very high
	Eco			X		
	Tech					X
	Quality					X
	Price	X				
Group name	<b>Ordinaries</b>					
Description	This group consists of ordinary people living often day to day life and having not much savings. They are moderately environmentally sensitive, but the most important feature is the price of the system. They can accept installing technologically advanced systems in their house, just only when they can afford the costs.					

Preferences		Very low	Low	Medium	High	Very high
	Eco	X				
	Tech		X			
	Value		X			
	Price					X
<b>6. Market(s)</b>						
Localization	Germany					
Market shares	Group name		Market share (%)			
	Eco Feaks		25%			
	Ordinaries		50%			
	Big Fishes		25%			
Localization	Poland					
Market shares	Group name		Market share (%)			
	Eco Freaks		20%			
	Ordinaries		70%			
	Big Fishes		10%			
<b>7. Events</b>						
There are no events in this scenario						
<b>8. The Game</b>						
Suggested duration (in round)	10					
Suggested number of teams	5					