Ämnesprov, läsår 2014/2015



Årskurs

Delprov A2

engelsk version

Elevens namn och klass/grupp

Prov som återanvänds av Skolverket omfattas av sekretess enligt **17 kap. 4 § offentlighets- och sekretesslagen**. Detta prov återanvänds av Skolverket t.o.m. **2021-06-30**.



11. Choice of heating system

About one third of the energy used in Sweden is used for heating. A municipality has decided to build a new indoor arena. The municipal government has not yet decided which type of heating system to use.



Your task is to write a proposal where you recommend which heating system the municipality should choose. You will recommend either geothermal heating, a pellet boiler or district heating. The purpose of your proposal is that the municipality government will be able to make a decision based on scientific arguments.

In your proposal, you will:



| Fact sheet | | Heating system | | |
|------------|--------------------------------------|--|---|---|
| | | Geothermal heating | Pellet boiler | District heating |
| Aspects | Energy Source of energy | Bedrock | Waste products from trees. | For example household waste and biofuels. |
| | Thermal efficiency | 1 KWh of electrical energy provides 2.7 KWh of heat. | 1 KWh energy from pellets provides 0.85 KWh of heat. | 1 KWh energy from fuel provides 0.9 KWh of heat. |
| | Electrical energy | Added electric energy, see diagram. | Added electric energy, see diagram. | Added electric energy, see diagram. |
| | Capacity | On cold winter days, geothermal heating may have to be supported by electricity. | Can deliver the same amount of heat all year round. | Can deliver the same amount of heat all year round. |
| | Installation | | | |
| | Life span | 15-20 years | 15 years | 25 years |
| | Function | Extracts energy from the bedrock by sending fluid into a borehole through a hose. The fluid is heated, comes back up and heats the water for radiators. | Extracts energy by burning pellets (compressed saw dust) and heats water for radiators. | Extracts energy by burning household waste and biofuels and heats water that is transported in underground pipes to radiators. |
| | Environment | | | |
| | Transports | None | Pellets are transported once every two months by truck to the indoor arena. | Household waste and biofuels are transported daily by truck to the district heating power plant. |
| | Emissions | None | When burning pellets, carbon dioxide and water are formed. | When burning household waste, carbon dioxide and water is formed, along with some nitrous oxides and sulphur dioxide. One residue is heavy metals. |

Added electrical energy to heating system



Electricity production in Sweden









Institutionen för tillämpad utbildningsvetenskap