The filter and the funnel

Problem sheet

The funnel problem

A company makes funnels from moulded plastic.
What is the best shape cone to make if they want to use plastic efficiently?

If the funnel had to have a capacity of 500 cm^3, what would the radius and height have to be to minimise the surface area?

How about a capacity of 2000 cm^3?

Can you explain the relationship of your findings to the original problem?