Ex 11   Energy of a soccer ball in flight

The goalkeeper kicks a soccer ball about half the length of the field.

The diagram above shows the system of the ball, surrounding air and planet Earth within the broken line. This system will be considered at 3 stages:
1 just before the ball is kicked,
2 at the highest point of its flight, and
3 part way down.

The work-energy bar chart for the system just before the ball is kicked is shown in Fig. 1. Complete the work-energy bar charts for Figs 2 and 3.

Follow the usual conventions with the work-energy bar charts:
- gravitational potential energy $U_g$ is positive if the object is above the x-axis,
- the object has kinetic energy $K$ if it is moving,
- an elastic object has elastic potential energy $U_s$ if it is stretched or compressed,
- internal thermal energy $U_{int}$ is generated if objects rub against one another, and
- work $W$ done on the system is positive and work done by the system is negative.