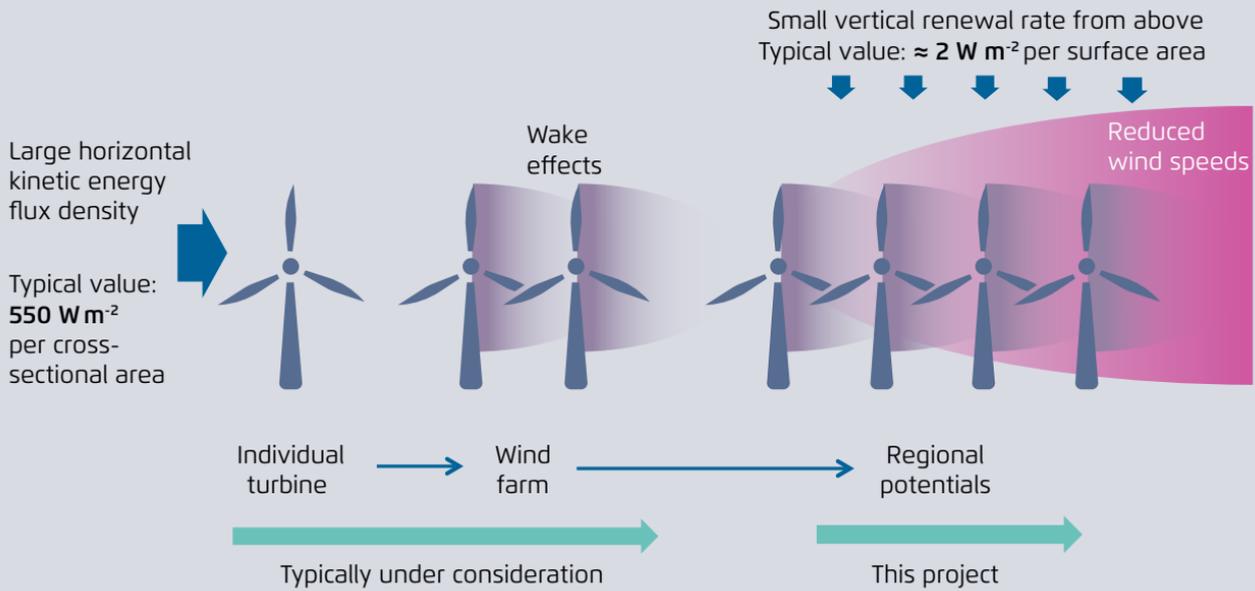


The yields of many wind turbines decline by different factors relative to an individual turbine

Figure 3



In a wind farm (middle), wake effects (indicated by the purple shade) of turbines reduce yields of turbines located downwind. At regional scales (right), the effect of turbines of removing kinetic energy from the atmosphere (indicated by pink shade) lowers wind speeds and yields in downwind regions. The values shown in the figure are based on typical values for the annual means for the North Sea, but the actual values show large variations due to varying wind conditions. Note that the magnitude of the vertical renewal rate is limited by the comparatively low generation rate of kinetic energy by the atmosphere, which is set by thermodynamics.