

KidWind / Know Energy

# VIII. Siting a Small Wind Turbine Or . . .

What gives small wind turbines a bad name?

First, find an area with lots of  
wind

You Know You Are in Wind  
Country When. . .

There are lots of kites in trees



# Everyone has a new umbrella



All the old farmers have new hats



All the trees lean the same direction







JL PHOTOGRAPHY

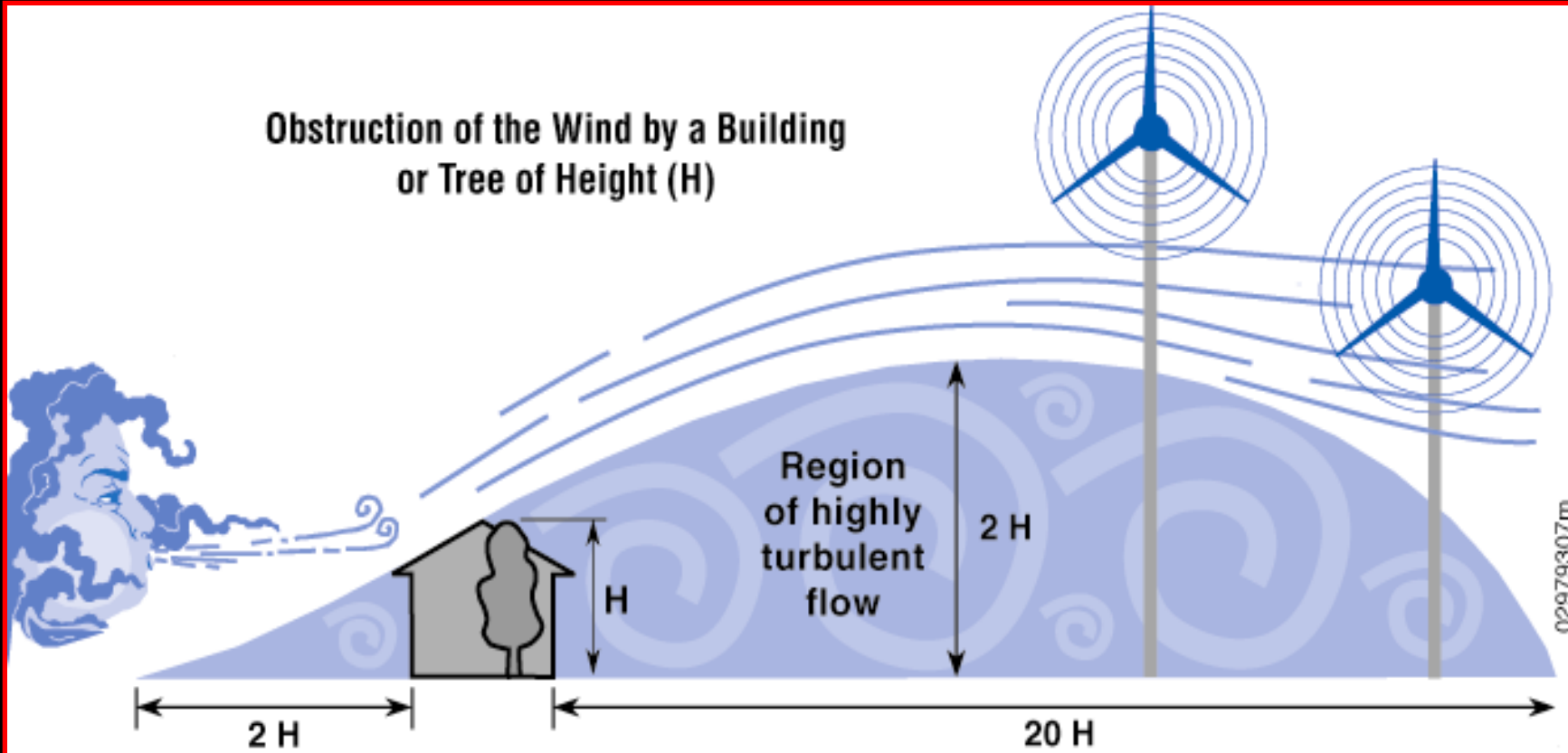
There are lots of  
bad hair days



# Next, find an area with lots of “smooth” air

- “Smooth” air is defined as air relatively free of turbulence
- Turbulence is caused by obstacles in the path of the air

### Obstruction of the Wind by a Building or Tree of Height (H)



# Math Activity 1

## How to determine height of obstructions

- Use the height finder by looking through the tube.
- Move until you can see the top of the obstruction while looking through the tube at the same time making sure the weighted string lines up with the reference line.

- Using similar triangles, the height of the tree is equal to the distance from the tree to where you are standing (plus the distance from the ground to your eye.)

# Math Activity 2

## How to determine turbine height

I want to install a wind turbine near my house.

- My house is 20 feet tall
- My property only goes back 200 feet
- How high should my turbine be for maximum efficiency?

# Calculations

Height of obstruction (H) is 20 feet.

Turbulence will be found within 400 feet of house ( $20 \times H$ )

To be above the turbulence, the turbine should be at least 40 feet tall ( $2 \times H$ ), but 50 feet would be better.

So why don't small wind turbines produce as much electricity as the salesmen promise?





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End of Lesson VIII.