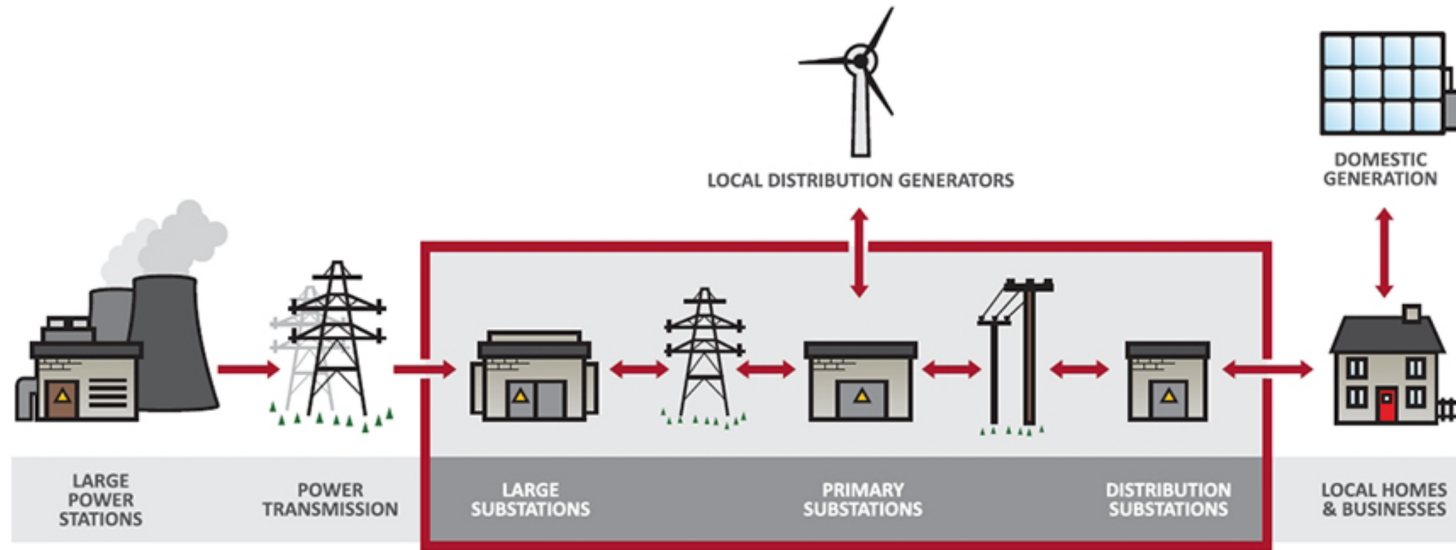


# Northern Powergrid – Engineering: Problem Solving and Power Issues

[www.northernpowergrid.com/education](http://www.northernpowergrid.com/education)





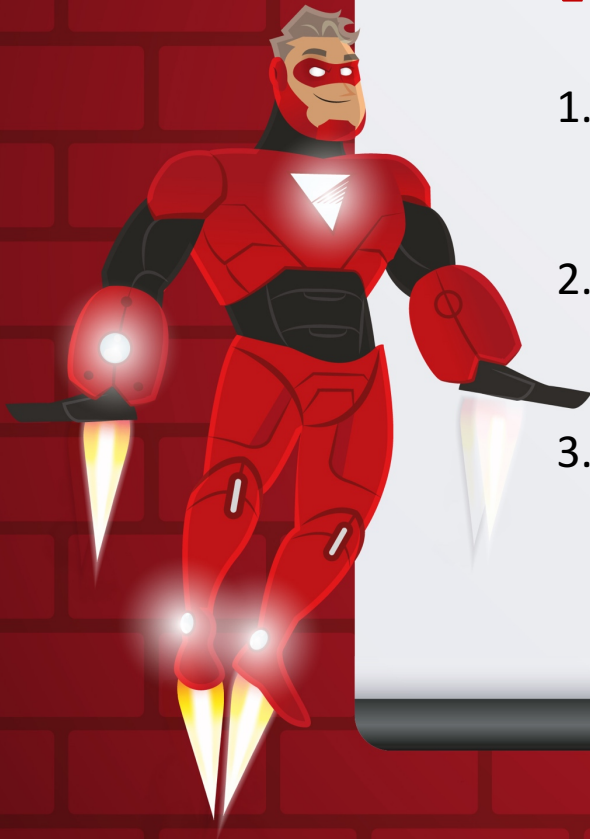
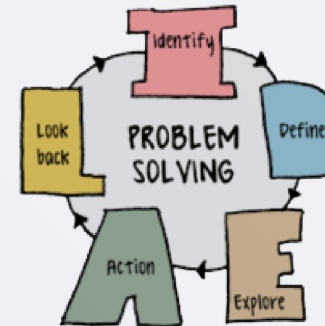
- Northern Powergrid is the Distribution Network Operator (DNO) for the North East of England, Yorkshire and northern Lincolnshire.
- We distribute electricity to 3.9 million homes and businesses.
- As a DNO we do not own the energy we distribute – we charge electricity suppliers for the use of our overhead lines and cables to move energy they purchase from generators to the customers they supply.
- This charge to suppliers represents around 10% of customer's bills.



## Learning Objectives

1. To work in a team to find solutions to real world problems given.
2. To gain understanding of potential job roles in utilities.
3. To justify decisions made when facing a design problem.

## ENGINEERING IS FOR YOU!



Identify potential problems that can be faced during the installation of **electricity** lines.







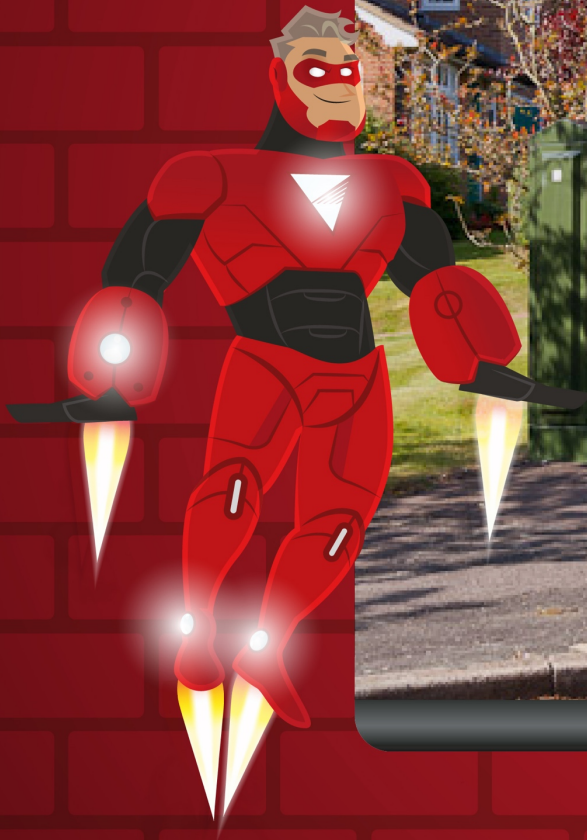












Identify potential problems that can be faced during the installation of **electricity** lines:

- noise pollution
- visual pollution
- diminished access (to homes, amenities, businesses etc.)
- traffic (disruption).

Are there any other issues to consider?







## Scenario

You are the Planning Engineer to supply electricity to a new housing development.

Your substation is 10 miles from the location with green land, a main road, gas lines and other residential and industrial developments in the way.



## Task

Your task is to identify the issues and propose a solution.  
Use the map to route your power and the worksheet to document your decisions.

## Issues to consider:

Generate a list of issues you might face as the planning engineer.

Consider how the electricity will be distributed. Who will see it? What land may it have to pass through? Who might be unhappy? Why? What are the power lines encased in?



## Issues to consider:

### HINTS

Noise Pollution

Disruption to traffic

Visual Pollution

Anything else?





## Issues to consider:

Are there any additional considerations to consider?

Are there any environmental concerns above or below ground?

What might they be?



## Issues to consider:

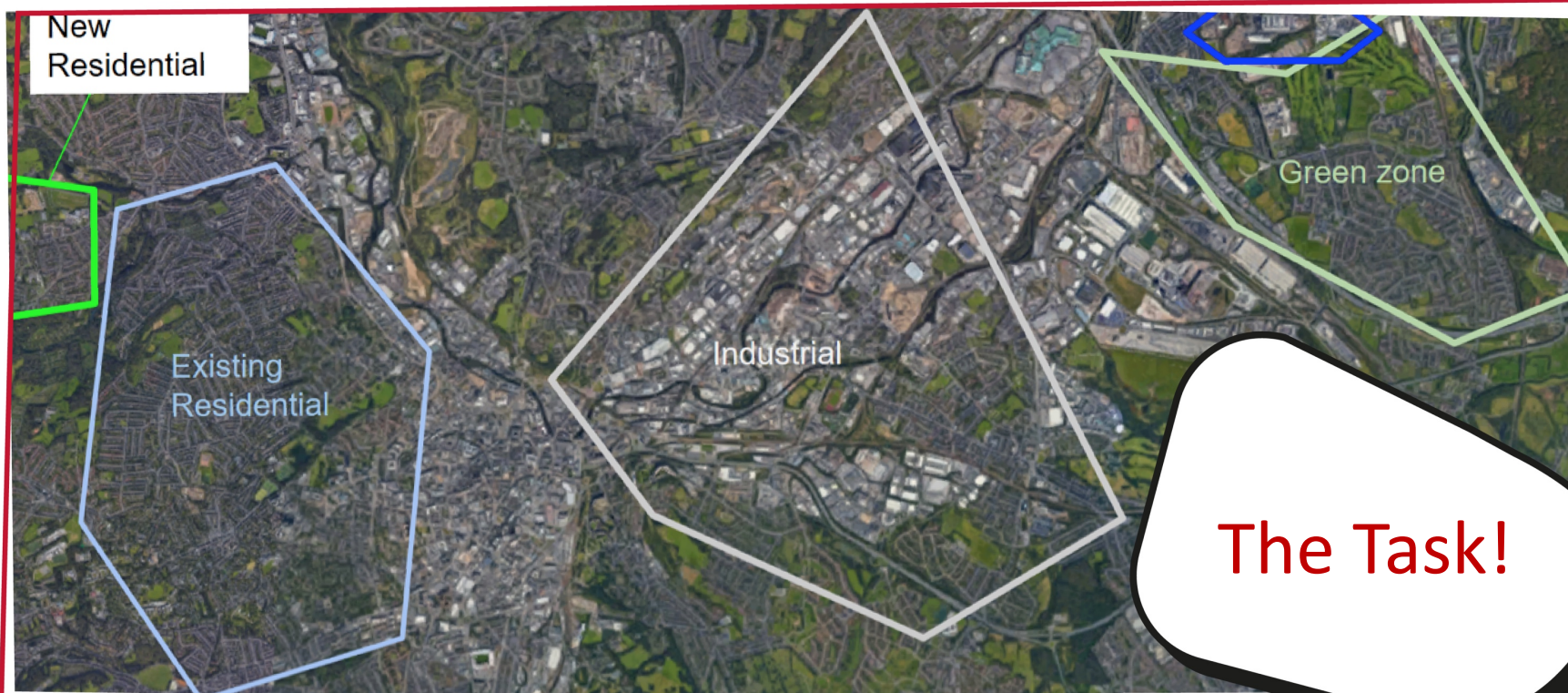
Where might additional cost incur?

What other teams of people need to get involved?

Would this change the costing?







The Task!





## Discussion

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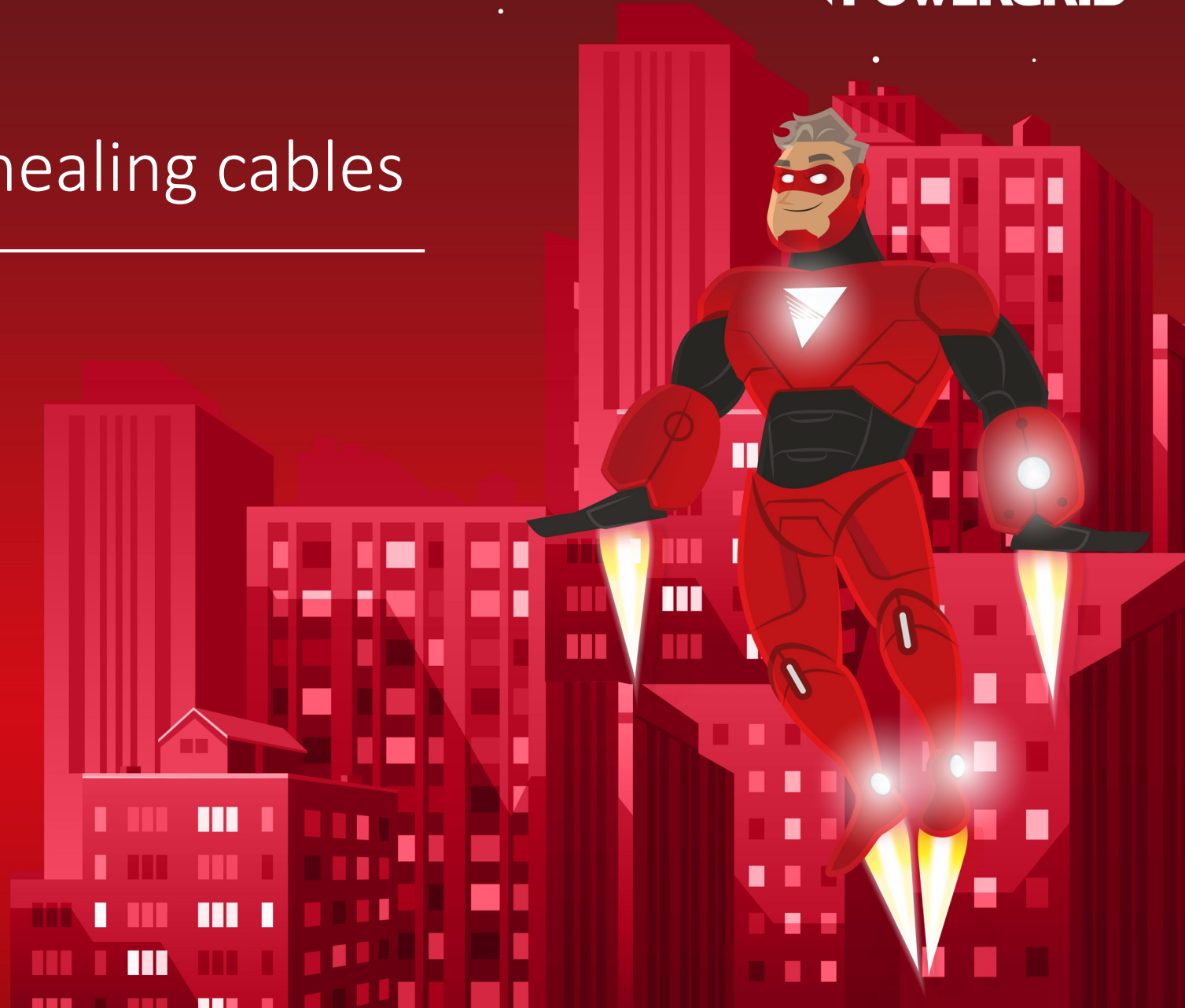
Share the issues you've identified and solutions you've suggested with the rest of the class.



# Real life example: Self-healing cables

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Possible solution: Northern Powergrid have collaborated with a science and technology innovation company called Gnosys Global to research self-healing cables. These cables will have an additive in the fluid used to cool and insulate a regular cable. Now, when a crack or hole appears the fluid will react with the air and plug the gap.

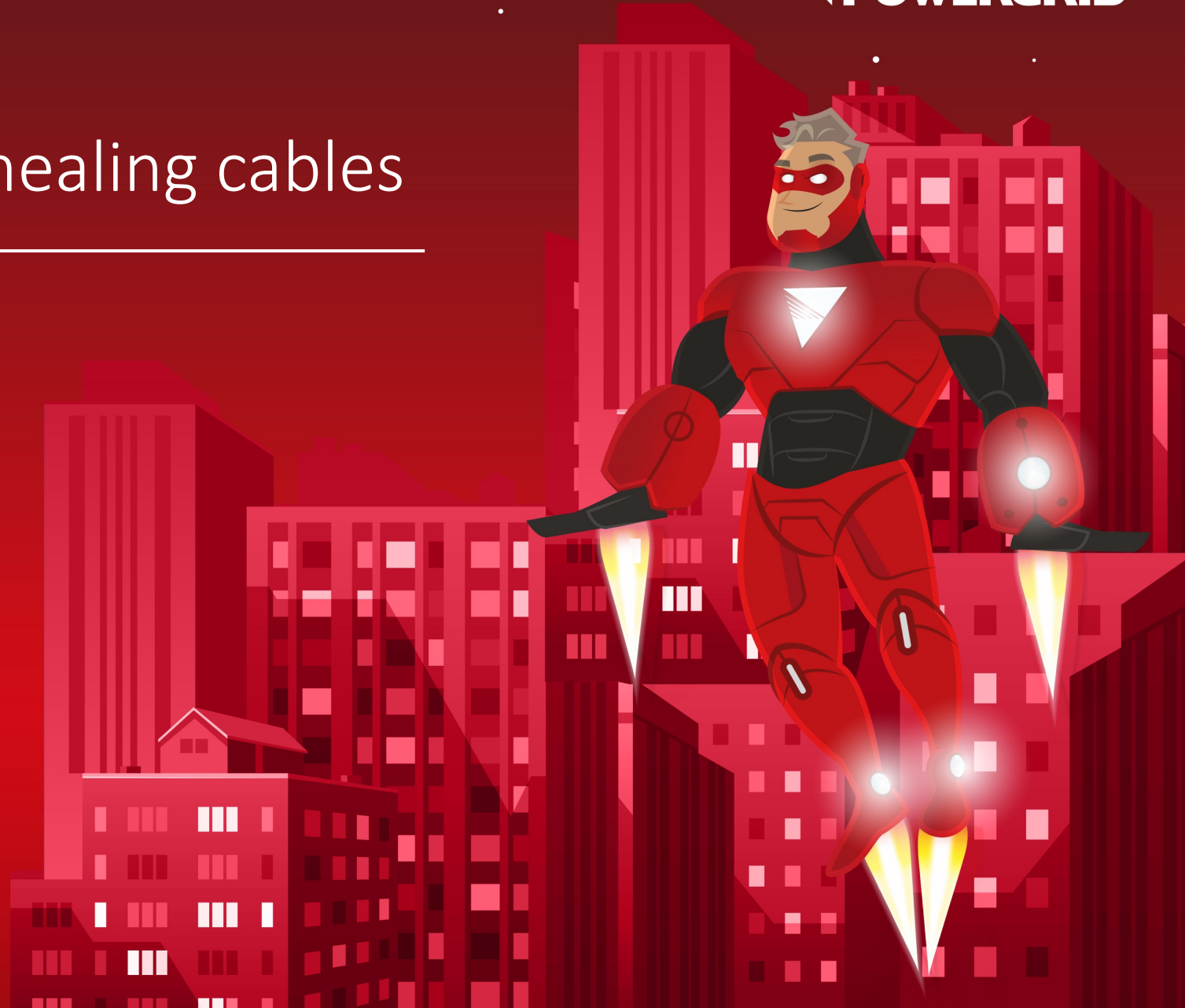




## Real life example: Self-healing cables

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The result: an environmentally friendlier new technology which could result in millions of pounds of savings each year. The lifespan of the cables is increased, and the risk of disruption, pollution is reduced.



# Next Steps

Think about the infrastructure in your local area - How is the power supplied to your house? What sort of issues may be faced if new lines or maintenance were needed?





# Next Steps

Write a short paragraph explaining the issues you have come up with.





Well done!

