

# Energy Future

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Where we operate.....



**25,000km<sup>2</sup>**

is the area we serve - spanning large urban centres  
and sparse rural areas

**2,700,000**

the number of customers to which we transport gas.

## Fast Facts.....

**37,000km**

the length of pipeline that we own & maintain



# Past





R110 - Business As Usual



# Present

R110 BAU



Energy Trilemma





# Sources of Gas

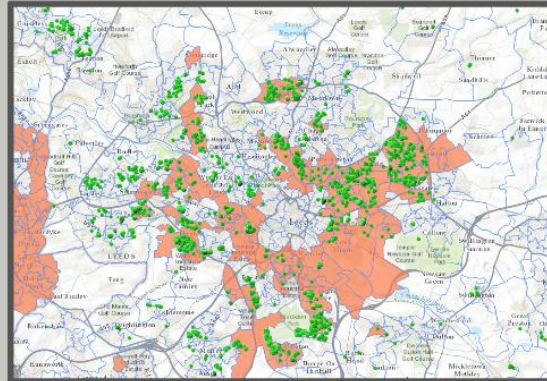


Energy Security

>35%

>70%

Off gas communities  
opportunities....



# Value for Money



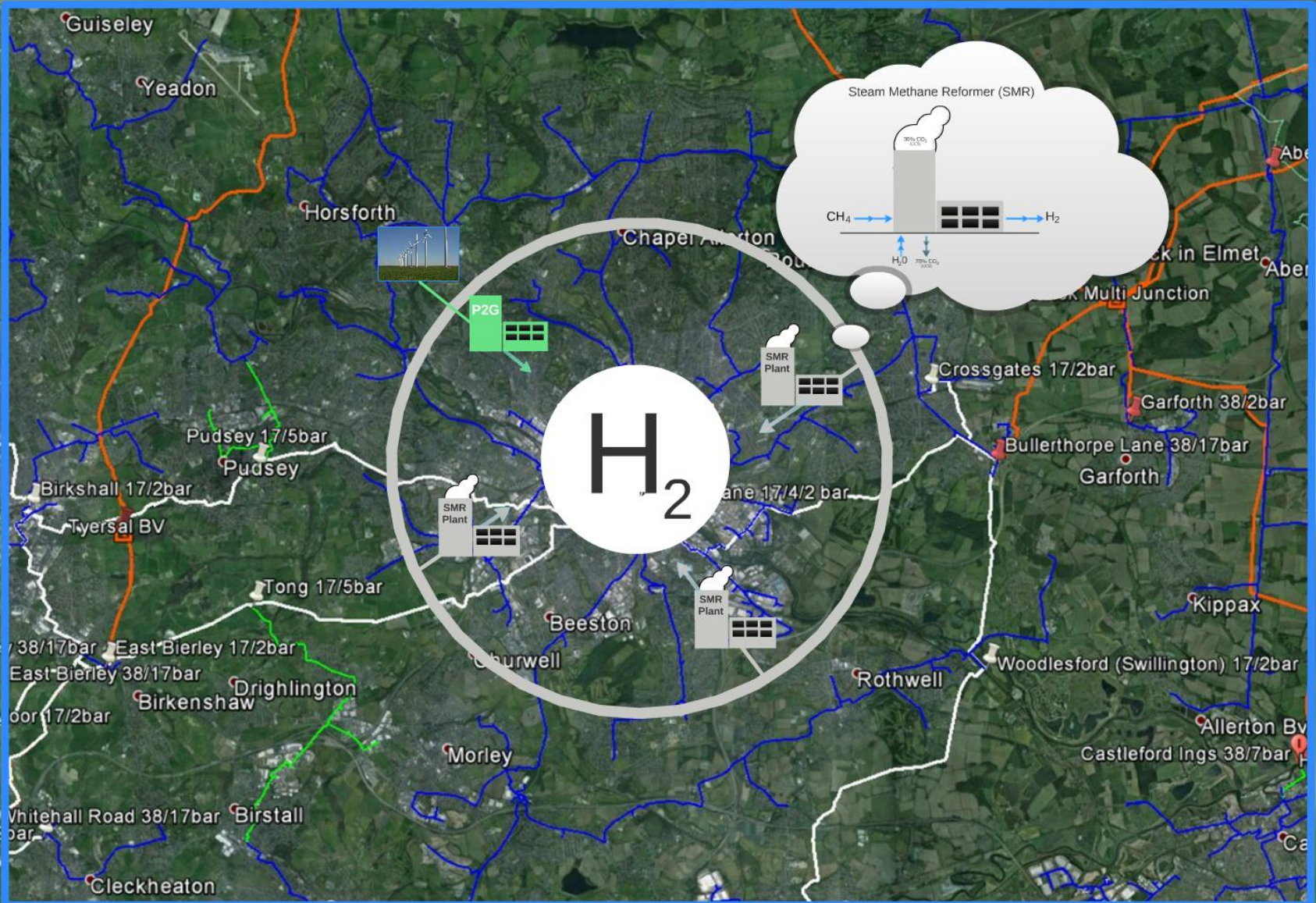
Electrical infrastructure is a minimum  
x6 capital cost of equivalent gas infrastructure

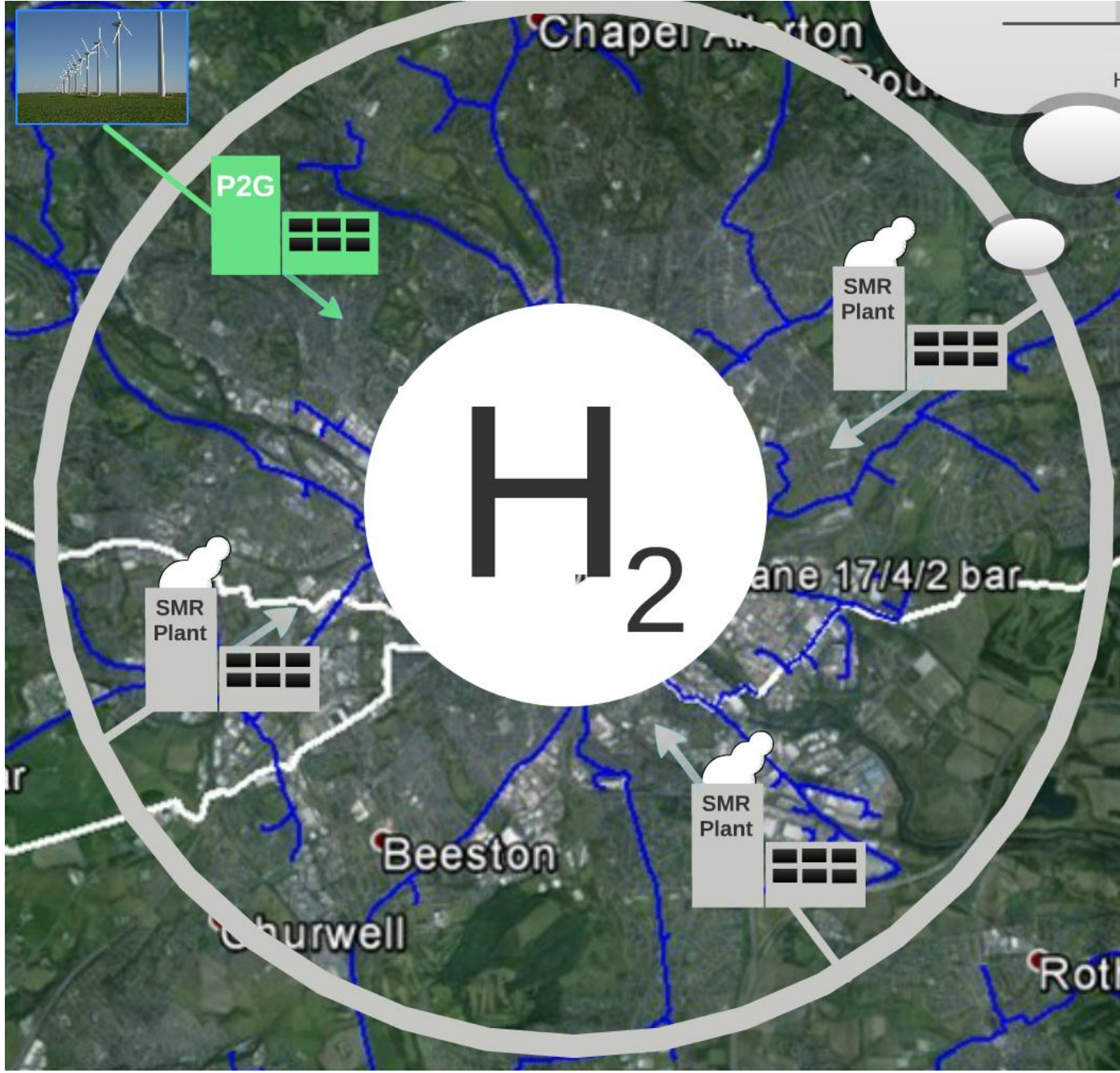


# Carbon Reduction

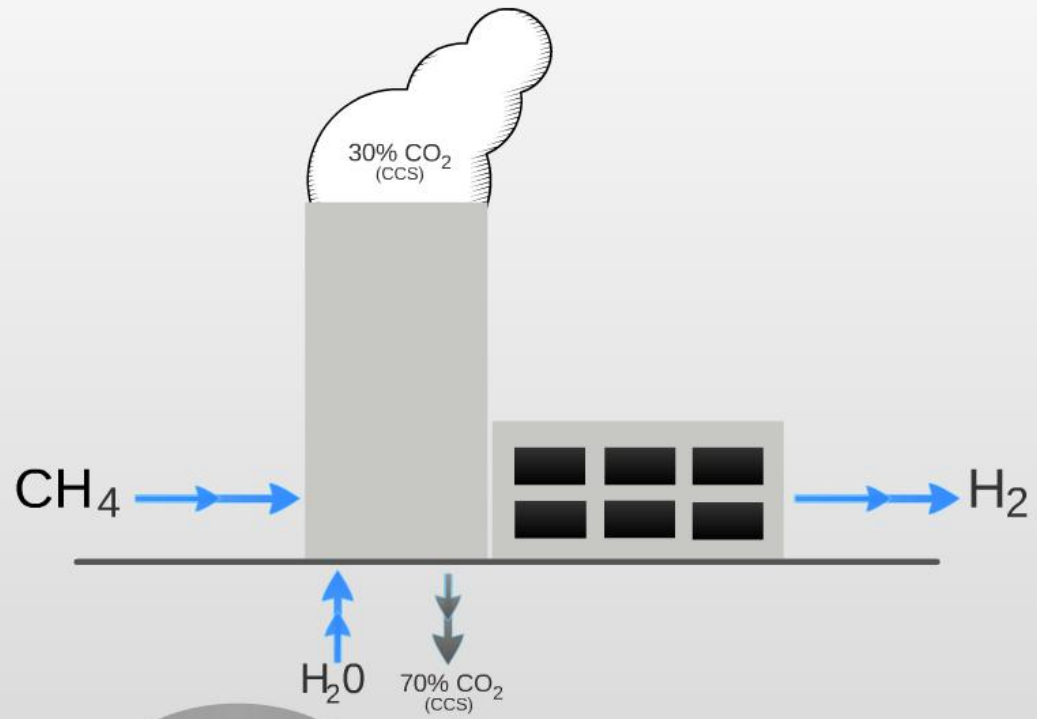


# H21 Leeds City Gate





# Steam Methane Reformer (SMR)



The ultimate vision....



### Infrastructure - New & Existing

- H<sub>2</sub> causes embrittlement on >7bar networks
- 17bar ring main (CH<sub>4</sub>) - BAU spend
- PE conversion below 7bar - BAU spend
- SMR's/CO<sub>2</sub> pipeline/conversion - Additional spend

Hydrogen is....  $\frac{1}{3}$  the energy of methane  
&  
 $\frac{1}{8}$  the density of methane

Feasibility....



Pressure drop	∝	Density × Velocity <sup>2</sup>
	∝	$\frac{1}{8} \times 3^2$
	∝	1.125

# The jigsaw.....

### The three parts of energy

Production → Transportation → Consumption

The less change, more achievable & potentially cheaper!

### Lessons of the past

Town gas used to be >50% H<sub>2</sub>.....  
Hong Kong town gas is >70% H<sub>2</sub>.....

.....the 60's & 70's saw a conversion to Natural Gas.

We've done it before!

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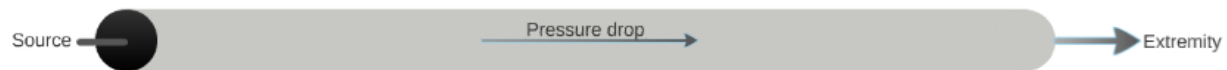
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Feasibility....



$$\begin{aligned} \text{Pressure drop} &\propto \text{Density} \times \text{Velocity}^2 \\ &\propto \frac{1}{8} \times 3^2 \\ &\propto 1.125 \end{aligned}$$



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The ultimate vision....







Can't see the future but we can help  
define it!