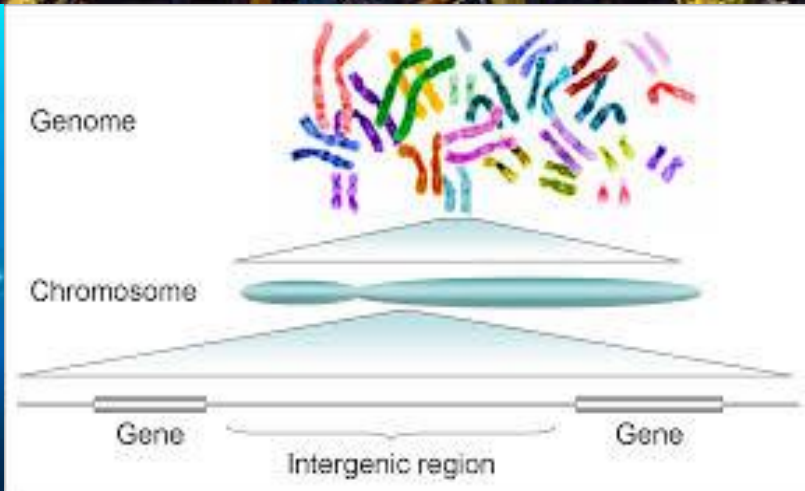
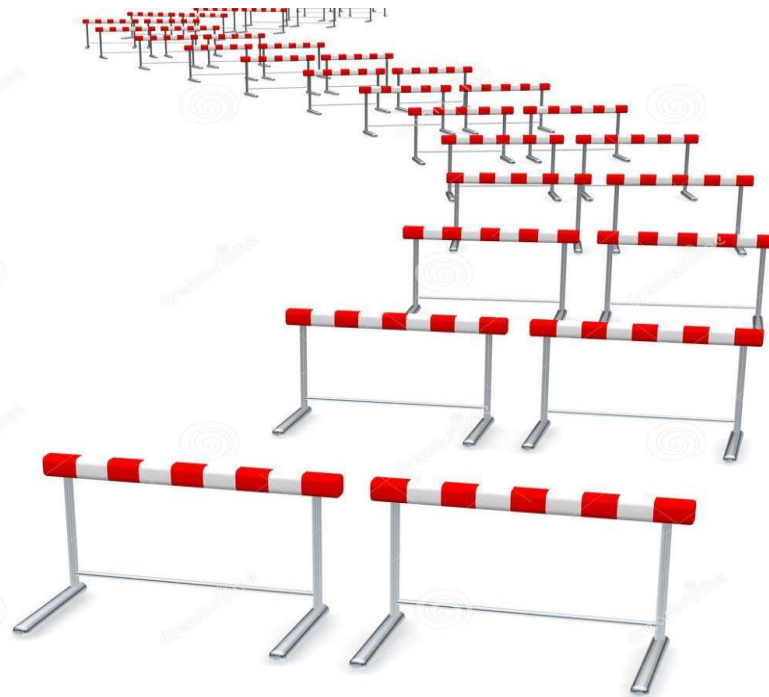




KEEPING THE LIGHTS ON

Ian Marchant





POLITICAL UNCERTAINTY



POLITICAL PHILOSOPHY

THE KEY QUESTION IS



REGULATION

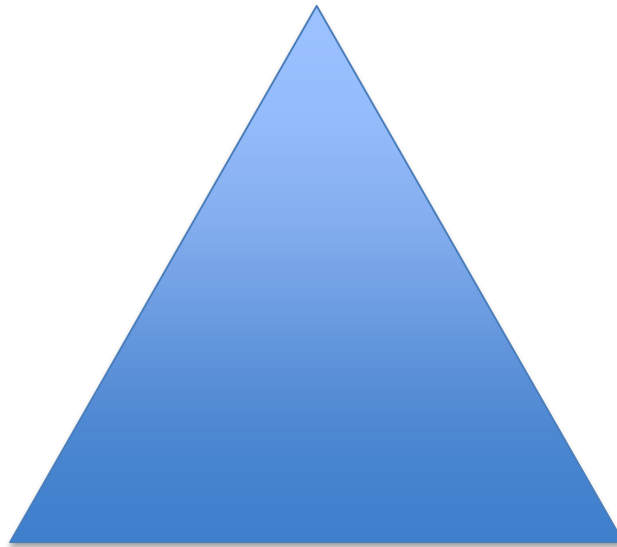
v



MARKET

THE ENERGY TRILEMMA

AFFORDABILITY



SECURITY OF SUPPLY

DECARBONISATION



ELECTRICITY MARKET REFORM



Energy Act 2013

LEGISLATION

The Department of Energy and Climate Change is responsible for the content of this document and any errors or omissions are the responsibility of the Department.



Electricity Market Reform

Consultation Document

OR



Electricity market reform:
policy overview

May 2011



Electricity Market Reform:
Consultation on Proposals for
Implementation

October 2011



A PRICE FREEZE



CONSTITUTIONAL CHALLENGES

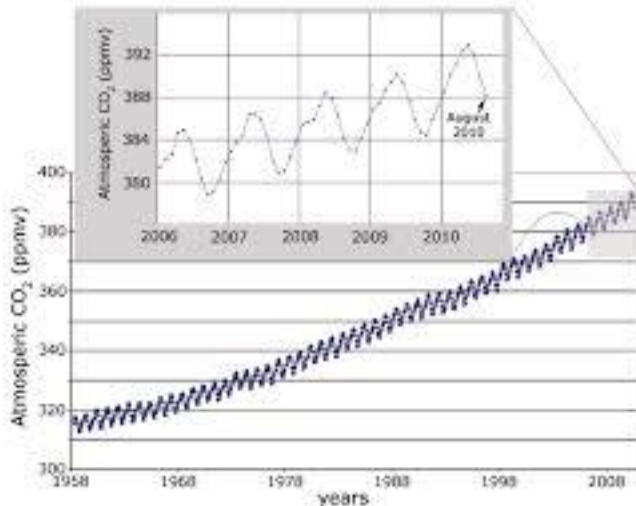


- Energy is not the most important subject
- Serious energy issues have to be addressed
- But they are being ignored. We deserve better

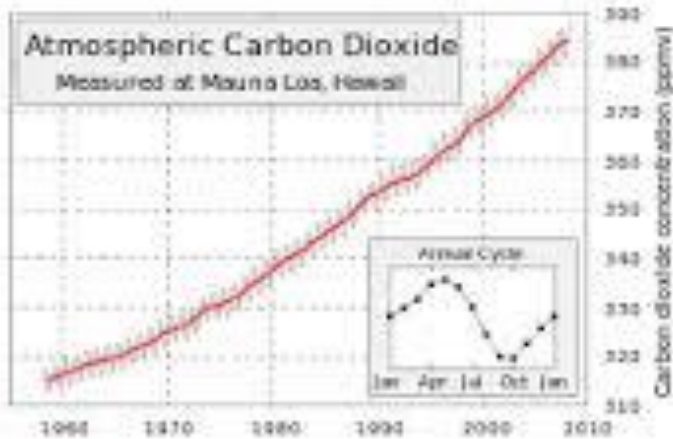
TIME FOR AN HONEST DEBATE

- The energy market needs to be either fully and independently regulated or properly driven by market forces
- Living in the twilight zone in between is really dangerous
- We need clarity around the energy trilemma
- The debate on constitutional change has to improve
- The current situation is a recipe for a real crisis

THE ECOLOGICAL CHALLENGES

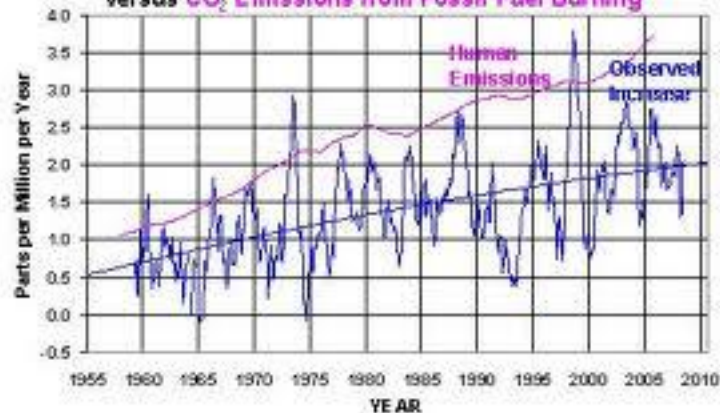


Atmospheric CO₂ at Mauna Loa Observatory
Data source: NOAA (<http://www.esrl.noaa.gov/gm>)



CO₂ Growth Rate at Mauna Loa, HI

versus CO₂ Emissions from Fossil Fuel Burning



THE INDUSTRY RESPONSE



A Super Smart Grid



- 1 Saving money:** uses technology to help us optimize our homes and businesses so we can buy electricity at the cheapest rates
- 2 Making money:** a smart grid allows everyone to sell unused power back to the system. A smart grid meter spins both ways

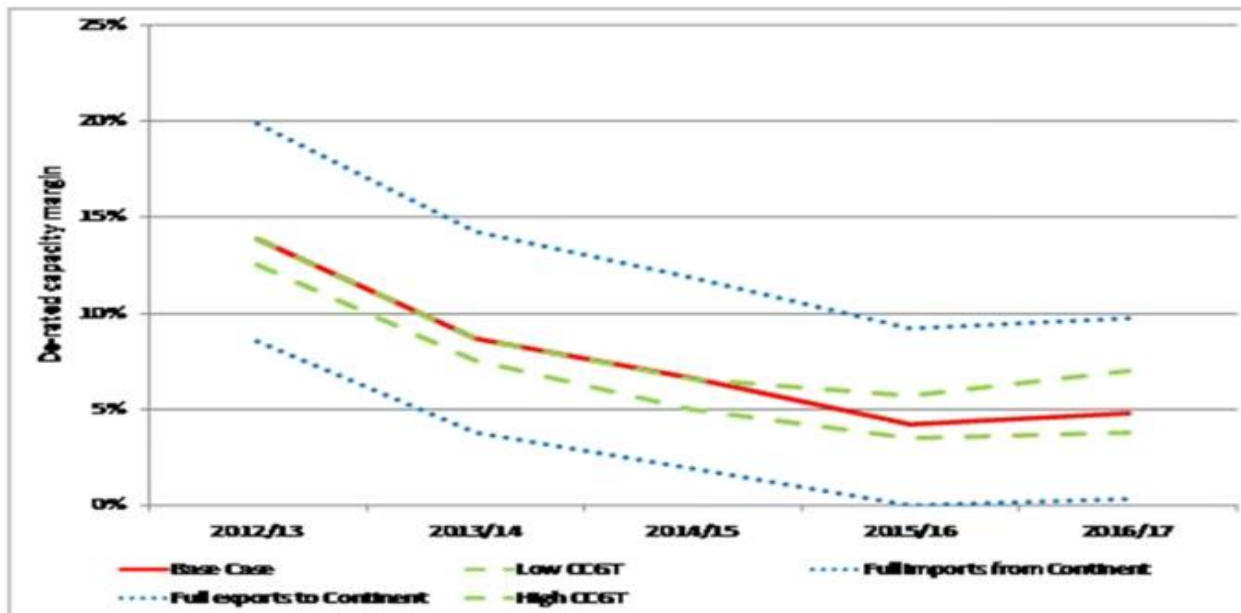


PHYSICAL CHALLENGES



Promoting choice and value
for all gas and electricity customers

OFGEM'S FOCUS IS MID-TERM (10 YEARS)



SOURCE: OFGEM CAPACITY REPORT OCTOBER 2012

BIG OR SMALL?



PHYSICAL CHOICES



COST AND CARBON

	COST per annum	Carbon emissions
Generation part of typical domestic bill	£250	2.5 tonnes

COST AND CARBON

	COST per annum	Carbon emissions
Generation part of typical domestic bill	£250	2.5 tonnes
All coal fired	£200	4.0 tonnes

COST AND CARBON

	COST per annum	Carbon emissions
Generation part of typical domestic bill	£250	2.5 tonnes
All coal fired	£200	4.0 tonnes
All gas fired	£250	1.5 tonnes

COST AND CARBON

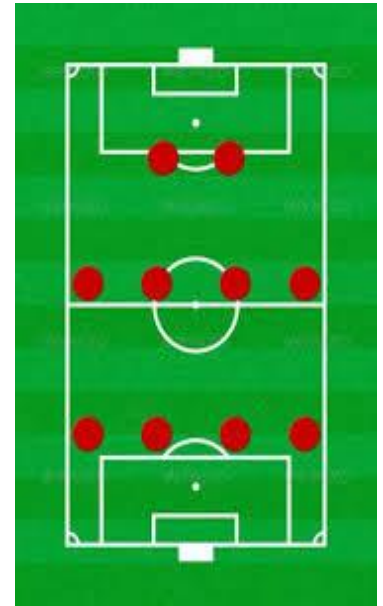
	COST per annum	Carbon emissions
Generation part of typical domestic bill	£250	2.5 tonnes
All coal fired	£200	4.0 tonnes
All gas fired	£250	1.5 tonnes
All onshore wind	£360/£250	ZERO

COST AND CARBON

	COST per annum	Carbon emissions
Generation part of typical domestic bill	£250	2.5 tonnes
All coal fired	£200	4.0 tonnes
All gas fired	£250	1.5 tonnes
All onshore wind	£380/£250	ZERO
All nuclear	£370	ZERO

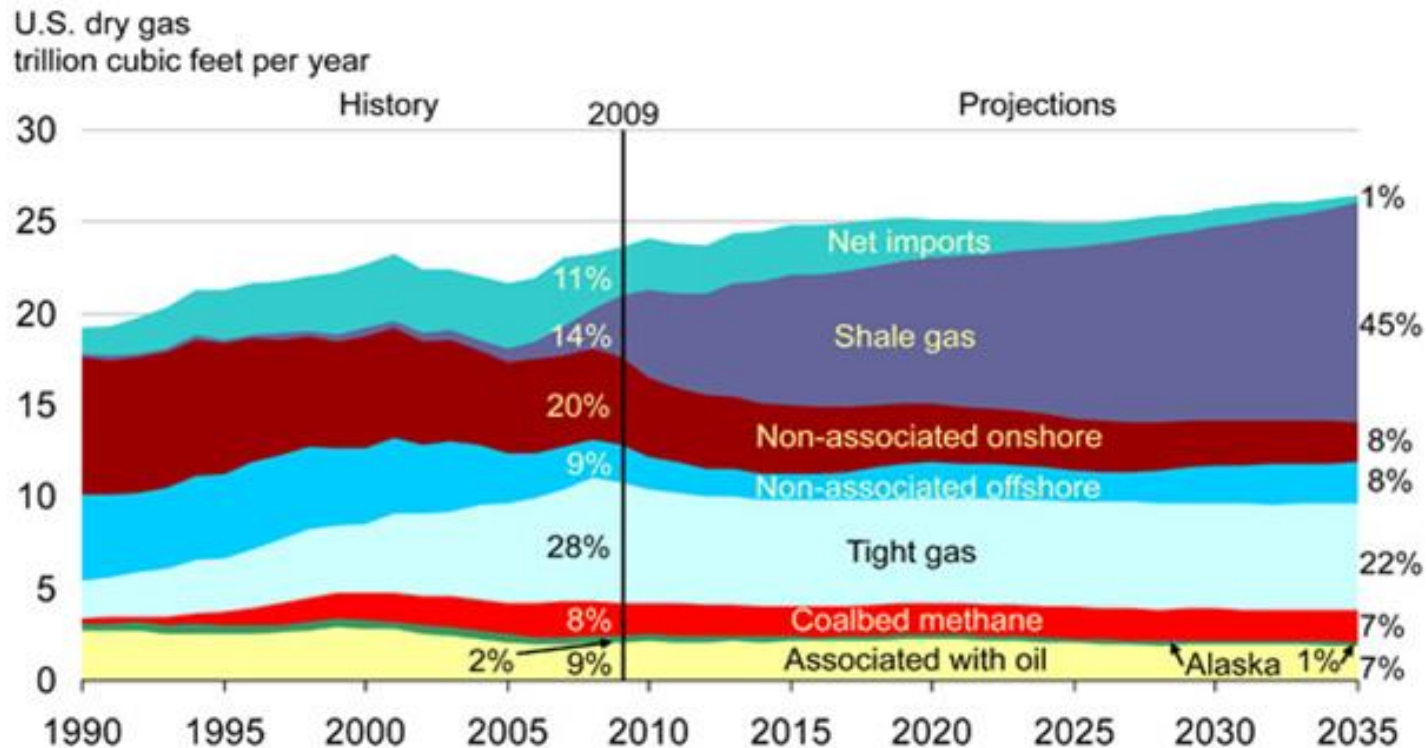
THE ANSWER IS...

- Inspired by a football formation. 4 : 4 : 2
- 20% from a combination of energy efficiency and distributed generation
- 40% from a variety of renewables; wind, marine, solar, biomass.
- 40% from gas fired generation
- This would give a bill similar to the amount paid today but carbon emissions would only be 0.5 tonnes pa



ANOTHER PHYSICAL CHALLENGE IS AROUND SHALE

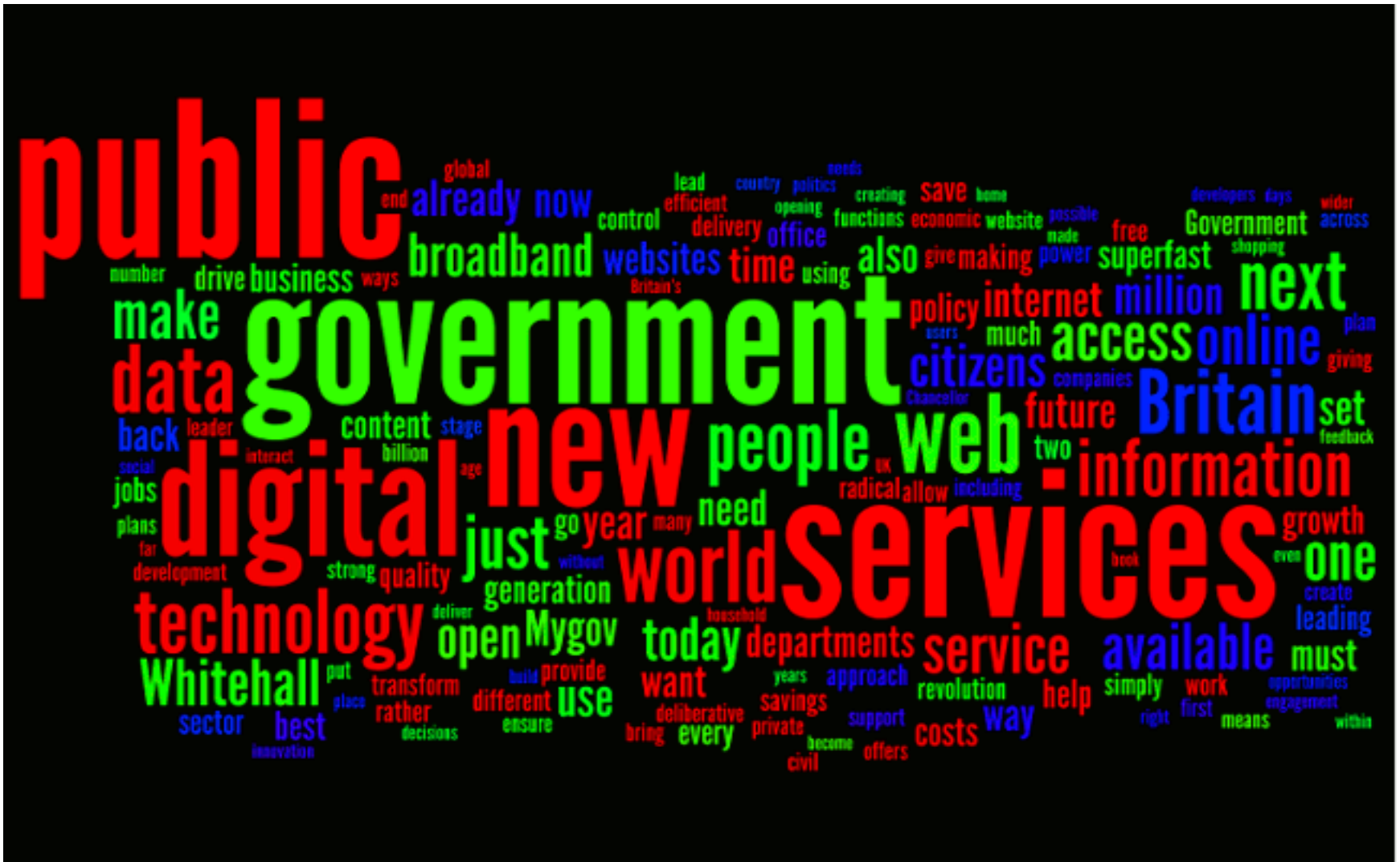
Shale gas has transformed the US energy landscape and stimulated the economy



IS THIS ANOTHER US TREND WE SHOULD BE FOLLOWING

- Our reserves are more challenging and we don't have an onshore drilling culture
- It will help on security of supply and affordability but will not change the overall picture
- It reinforces the role that gas can play in electricity generation but we need CCS on gas.

DIGITAL CHALLENGES





Dashboard

Getting Status..



Mon

Tue

Wed

Thu

Fri

Sat

Sun



HEATING

WATER



UK Grid Carbon Intensity

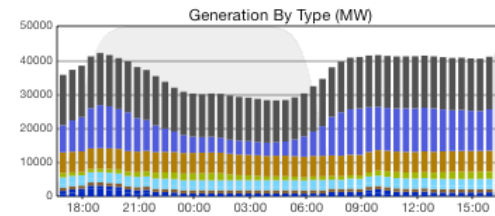
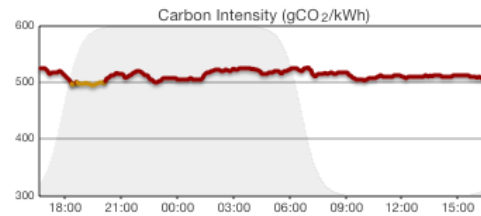


506

gCO₂/kWh

42.4

GW



Coal

15400 MW

(36.3%)



Gas

13700 MW

(32.4%)



Nuclear

6100 MW

(14.5%)



Wind

2100 MW

(4.9%)



French IC

2000 MW

(4.7%)



Dutch IC

1000 MW

(2.4%)



Other

960 MW

(2.3%)



Hydro

820 MW

(1.9%)



Storage

320 MW

(0.8%)



Irish IC

0 MW

(0.0%)



East-West IC

0 MW

(0.0%)



Oil

0 MW

(0.0%)



Updated 10/03/2014 16:30 UTC



DIGITAL CHALLENGES

- Do we know what we don't know
- What does the smart grid actually mean?
- How will the 'Internet of Things' affect the electricity industry?
- Can we cope with the customer of one?



AND FINALLY.....

We need to:

- Have an honest debate on the philosophy of energy.
- Deal with the ecological challenges.
- Start building a balanced mix of generation.
- Embrace digital change.

TO KEEP THE LIGHTS ON

