2020 vision – The next generation – FS&T storyline

[The slides follow this text]

[COVER SLIDE]

1. First and foremost, I would like to thank the Foundation for their kind invitation to present this evening and for circulating copies of our recent report, 2020 vision - the next generation
2. 2020 vision is the culmination of a significant piece of Deloitte energy research looking at the future of power generation in the UK over the next 15 years and beyond and I hope over the next few minutes to share with you our key findings
3. We specifically designed our work to provide all stakeholders in the energy policy debate with clarity on what is clearly a complex set of issues, through providing a common framework for deliberation. We hope that the results will benefit all stakeholders, including Government as they consider Energy Policy over the course of the current review

[INTRODUCTION]

4. I'd like to start by briefly introducing our headline conclusions, then outline the key considerations in reaching these views:
5. Firstly, there's an urgent need to address the emerging energy gap as existing nuclear and coal plant retire. Doing nothing to address the current situation whereby new investment is likely to be in gas-fired technology, is not a viable option
6. Secondly, diversification, both in terms of the type of fuel and technology employed, should be our ultimate goal in order to achieve energy policy objectives and nuclear power will likely have a role in such a diversified future
7. And thirdly, long-term certainty in both the regulatory regime and the market framework will be essential to stimulate the required level of investment in the UK
8. But what exactly is the problem we're facing?
9. Over recent decades in the UK, we've experienced some of the lowest energy prices in Europe, we've had an effective, liberalised market, we've had access to our own reliable indigenous fuel supply, and we've made measurable progress on reducing emissions

[URGENT NEED TO ADDRESS EMERGING ENERGY GAP]

10. The reality is, all of this is now changing
11. Demand for power continues to increase, and the UK's current power generation portfolio is due to change significantly as existing nuclear and coal plant are retired
12. Based on our calculations, the energy gap could be equivalent to 50GW by 2020, or two-thirds of existing capacity, and importantly this gap starts to emerge in the very near term
13. Whilst intensifying demand-side initiatives, like encouraging energy efficiency, can undoubtedly make an important contribution to reducing the gap over time, most of the response will necessarily need to come from the supply side through the construction of new generating capacity

[DOING NOTHING IS NOT AN OPTION]

14. Our analysis strongly supports the conclusion that doing nothing to address the emerging energy gap is simply not an option
15. Without definitive action, it is possible that the majority of this gap will be filled with new gas–fired plant, potentially leading to a situation where up to 70% of our generation capacity is based on gas

16. Inevitably, much of the fuel required would increasingly need to be drawn from overseas, raising real questions about the level of security of supply and exposing the UK to volatile global energy markets
17. Also, the carbon dioxide emissions from the power sector (while likely being lower than today) would exceed our estimate of the potential 2020 target for emissions
18. In addition, electricity prices would likely be volatile as they would be prone to the effects of both fuel and carbon price fluctuations, thereby impacting affordability for all
19. So, if we do nothing, we face the potential for multiple-failures in the context of meeting energy policy objectives, with the associated challenges of managing the practical implications that this would create for business, the economy and the public at large

[SECURING CLEAN, AFFORDABLE ENERGY FOR THE FUTURE]

20. While the UK's energy policy objectives around energy security, emissions reduction and market efficiency are well documented, there are inherent tensions between each objective and the broader social and public policy agenda

21. As you're aware, Government has kicked off the debate with a consultation paper, highlighting the extent of the challenge and asking key questions around these objectives and how they should be achieved
22. In this context, we've developed a framework which will allow all stakeholders to contribute meaningfully to the debate
23. The approach is straight-forward : starting at the top of the triangle, you identify relevant stakeholders, then ascertain their objectives and consider whether these are aligned or are at tension with one another
24. Then you consider all the risks that could occur and prevent achievement of these objectives – we've defined over 40 risks around three broad categories – delivery, operations and affordability of the future energy mix – and these are listed in our report
25. In this way, we've created a position against which stakeholder interests can be referenced and challenged in order to determine the potential impact of differing energy policy decisions
26. Full details of our methodologies and the results of applying the framework to UK energy policy are contained in our report

27. The analysis led us to develop a number of illustrative power generation scenarios for the year 2020, drawing on different proportions of the various technologies available. We then measured the performance of each scenario in meeting the stated policy objectives using a combination of top-down financial and risk based measures, in order to inform our conclusions
28. We defined two scenarios on a “Business-as-usual” basis, where gas is the predominant technology and contrasted these against a Diversified Portfolio drawing on the full range of technologies available and a Low Carbon portfolio which includes a significant level of nuclear new build

[WHAT ARE THE KEY TRADE-OFF’S? (1)]

29. The output of this exercise has provided an insight into the trade-offs that inevitably occur in endeavouring to meet the overall objectives. One of the most important of these is between the level of capital investment required and the level of carbon dioxide emissions

30. Capital expenditure of some £50 billion is needed for each of the Diversified Portfolio and Low Carbon scenarios, where significant carbon emission reductions are achieved. As a country, we need to decide if this is a price worth paying
31. Without this investment - as illustrated by the BAU scenarios, which require significantly less capital - carbon dioxide emissions would be well above target levels, and up to three times higher than in the Low Carbon scenario

[WHAT ARE THE KEY TRADE-OFFS? (2)]

32. The scenario analysis is under-pinned by a financial model which calculates the costs and emissions associated with each technology, thereby facilitating determination of the impact of the technology mix contained within each of the scenarios
33. As the slide illustrates, the differing economics and characteristics of each technology (average generation cost, capital cost and level of CO_2 emissions) is one of the key considerations in understanding what policy changes may be required to stimulate appropriate investment and facilitate achievement of energy policy objectives

[WHAT ARE THE KEY TRADE-OFFS? (3)]

34. We evaluated each of the four scenarios developed against the 3 key financial measures from the previous slide and the risk groups
35. What's apparent is that there is no obvious winner, with each scenario representing a compromise in order to achieve given objectives
36. A BAU scenario would have the lowest capital cost and would be the easiest to deliver – as it requires little change from the status quo
37. Conversely, it would demonstrably fail to achieve carbon dioxide targets and would potentially be exposed to significant energy security risks around the requirement for imported gas
38. In contrast, a truly Diversified Portfolio or one which is inherently Low Carbon would require much greater levels of capital expenditure and would face significant risks from the extent of change required and the availability of the requisite low carbon technology. These scenarios would however meet and indeed exceed likely carbon dioxide targets and have a reduced exposure to fuel risks compared to a business-as-usual approach.

[CONCLUSIONS]

39. Taking all of these findings into account, our conclusions are clear, and we believe, most importantly, realistic

40. Firstly, there is a clear and immediate need for change to address the emerging energy gap – doing nothing is not an option and would fundamentally compromise the UK's ability to secure our energy future

41. Secondly, diversification should be the holy grail and is the only means of meeting energy security and reduced carbon emissions objectives, whilst maintaining market efficiencies and providing affordable energy for the future

42. In this regard, facilitating new nuclear build will involve taking decisions very soon on key issues such as waste disposal strategies, funding decommissioning liabilities and addressing planning, health and safety constraints. Placing a substantial level of reliance in the short term on emerging renewables and Carbon Capture & Storage technologies to secure our energy future – in the absence of nuclear new build – would represent a high-risk strategy

43. Future energy policy will of course need to be sufficiently flexible to accommodate nuclear and other low carbon technologies, as they are developed and implemented on a commercial scale

44. Finally, the Government must seek to provide a degree of long-term certainty in the regulatory and market framework in order to stimulate the appropriate investment to deliver on objectives. They must take the lead in specifying which fiscal and other policy levers will be deployed, and by how much, to signal to the market the structure within which technology choices are to be made

45. In our view, the carbon price is the key signal requiring immediate reform

46. Many questions of course remain to be answered, with our work strongly indicating that much more detailed analysis is required, both quantitative and qualitative to assess the outputs and risks associated with various options, ultimately to ensure we don't end up placing an undue level of reliance on unproven technologies

[FINAL]

47. Difficult decisions necessarily lie ahead, particularly in the first instance for Government, around both the supply and demand for power, to create a clear path for the next generation
48. Compromise, which is never popular will be essential if we are to succeed
49. The importance of this energy debate should not be under-estimated. Future policy will directly affect the welfare and security of our country, our people and our economy
50. This is a time for clarity of thought and analysis
51. Let the debate begin – but not take too long to reach a conclusion
52. Thank you

Deloitte.

2020 vision

The next generation

Meeting UK power generation objectives in 2020

- a strategic insight

Ross Howard

Wednesday, 8 March 2006

The Foundation for Science and Technology

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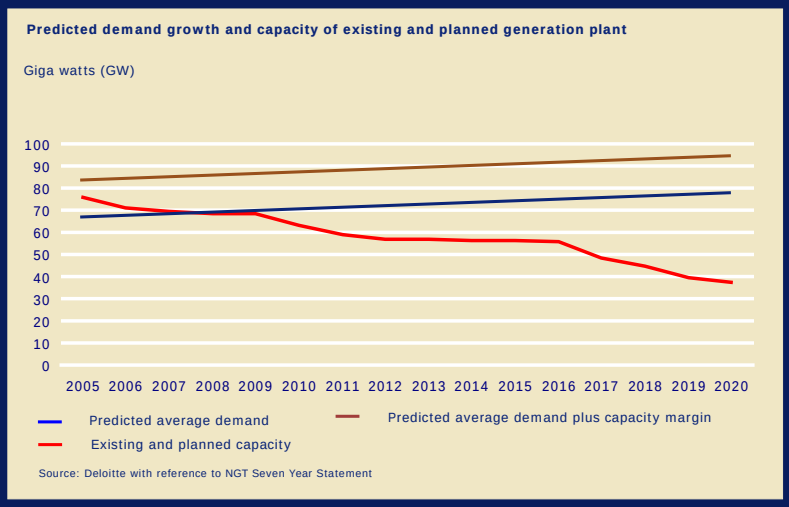
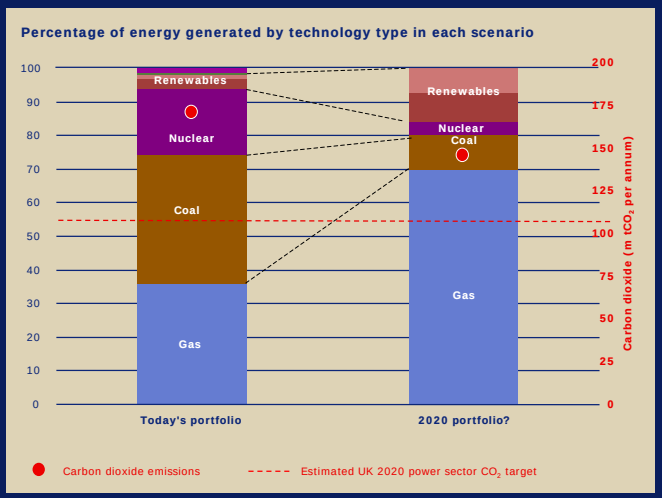
Introduction

- Urgent need to address emerging energy gap – doing nothing is not an option
- Diversification should be the holy grail
- Certainty needed to stimulate investment

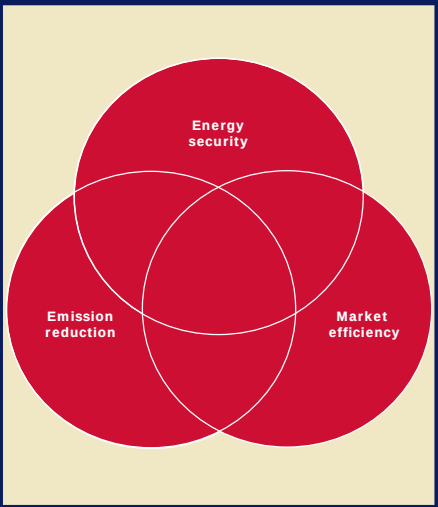
Urgent need to address emerging energy gap

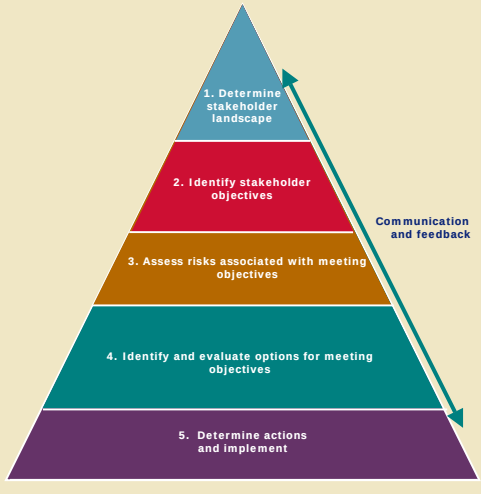


Doing nothing is not an option

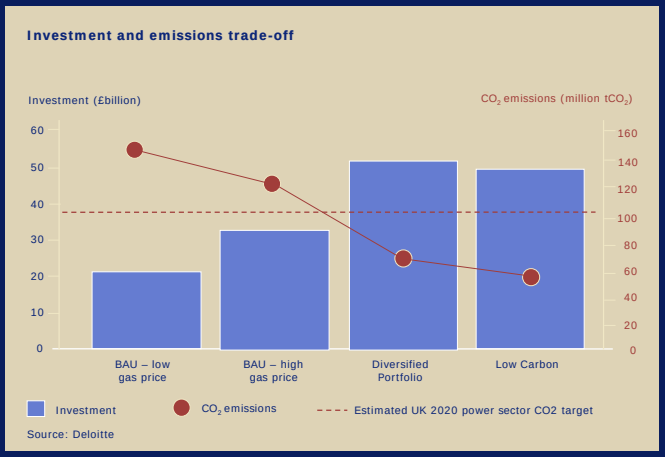


“Securing clean, affordable energy for the long-term”





What are the key trade-offs? (1)



What are the key trade-offs? (2)

Technology	Generation cost (£/MWh)	Capital cost (£/KW)	Emissions (tCO_2/MWh)
CCGT	27 – 37	450	0.20
Nuclear	36	1,200	-
Carbon capture and storage	40	1,125	0.03
Combined Heat and Power (CHP)	30	900	0.18
Wind (on-shore)	59	720	-
Wind (off-shore)	66	1,450	-
Wave / tidal	103	1,350	-

What are the key trade-offs? (3)

Comparison of scenario's attributes assessed against financial measures and risk groups

Scenario	Financial measures			Risk groups		
	Capital Investment	Average cost of generation	Carbon dioxide emissions	Delivery	Operations	Affordability
Business-as-usual (low gas price)	£	££	CCC	*	***	**
Business-as-usual (high gas price)	££	£££	CCC	**	**	**
Diversified Portfolio	£££	£££	CC	***	*	***
Low Carbon	£££	£££	C	***	**	***

Investment and cost of generation £ = lowest, £££=highest
Carbon dioxide emissions C=lowest, CCC=highest
Risk groups (Delivery, Operations, Affordability) *=low risk, ***=high risk

Conclusions

- Urgent need to address emerging energy gap - doing nothing is not an option
  - What proportion of gas and other imported fuels can be regarded as “secure”?
  - How important are emission reduction targets when considered in the context of energy security and market efficiency objectives?
- Diversification should be the holy grail
  - What are the biases and pre-dispositions for, or against, the use of particular types of technology?
  - What is the strategy for demand-side management and promoting energy efficiency?
- Certainty needed to stimulate investment
  - How can long-lived risks be effectively allocated between the public and private sectors?
  - How will certainty needed in carbon pricing signals beyond 2012 be delivered?

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