



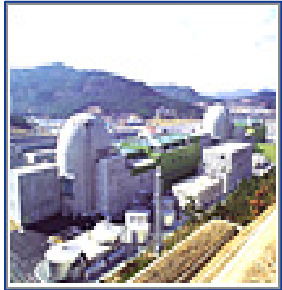
Doosan Babcock Energy

# Clean Coal and Carbon Capture and Storage – an opportunity for Scotland

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Director of Technology Policy Liaison

All-Energy IPA Session May 2009

# Company update – Doosan Babcock and Doosan Heavy



Nuclear



Thermal



Turbine &  
Generator



Desalination



Casting & Forging



Construction

- Doosan Babcock Energy Limited is a subsidiary of Doosan Heavy Industries and Construction of South Korea, part of the Doosan Group, and a market leader in gas, coal, nuclear power generation and desalination
- The company will offer Pre, Post combustion and Oxyfuel carbon capture and advanced supercritical boilers
- Doosan Babcock Energy has been designated the Doosan global Centre of Excellence and R+D Centre for Boilers (including Clean coal and CCS)

## PostCombustion

Doosan Babcock offers amine capture technology to its global customer base in the UK.

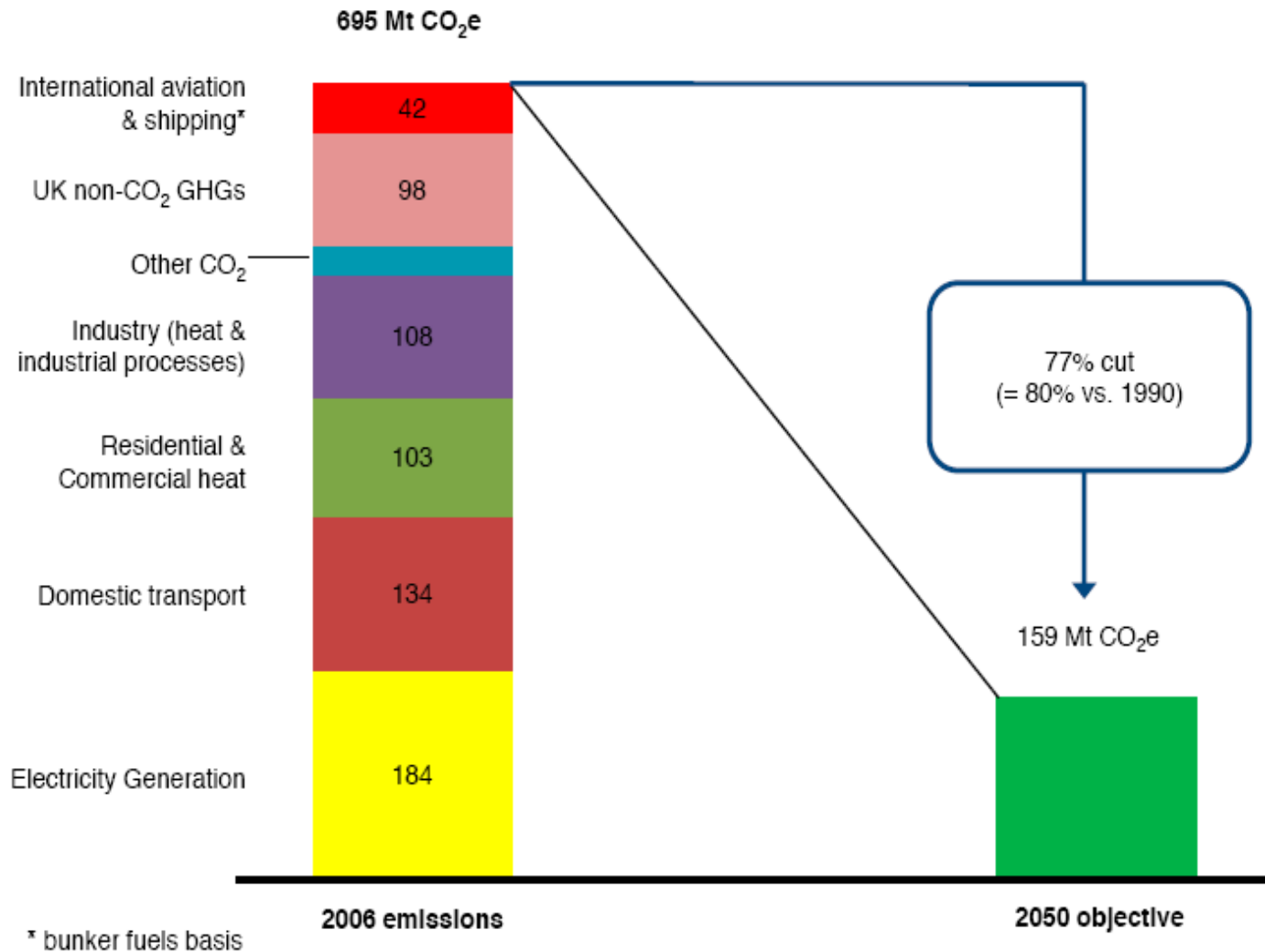
## OxyCoal™ 2

40MW pilot  
in UK



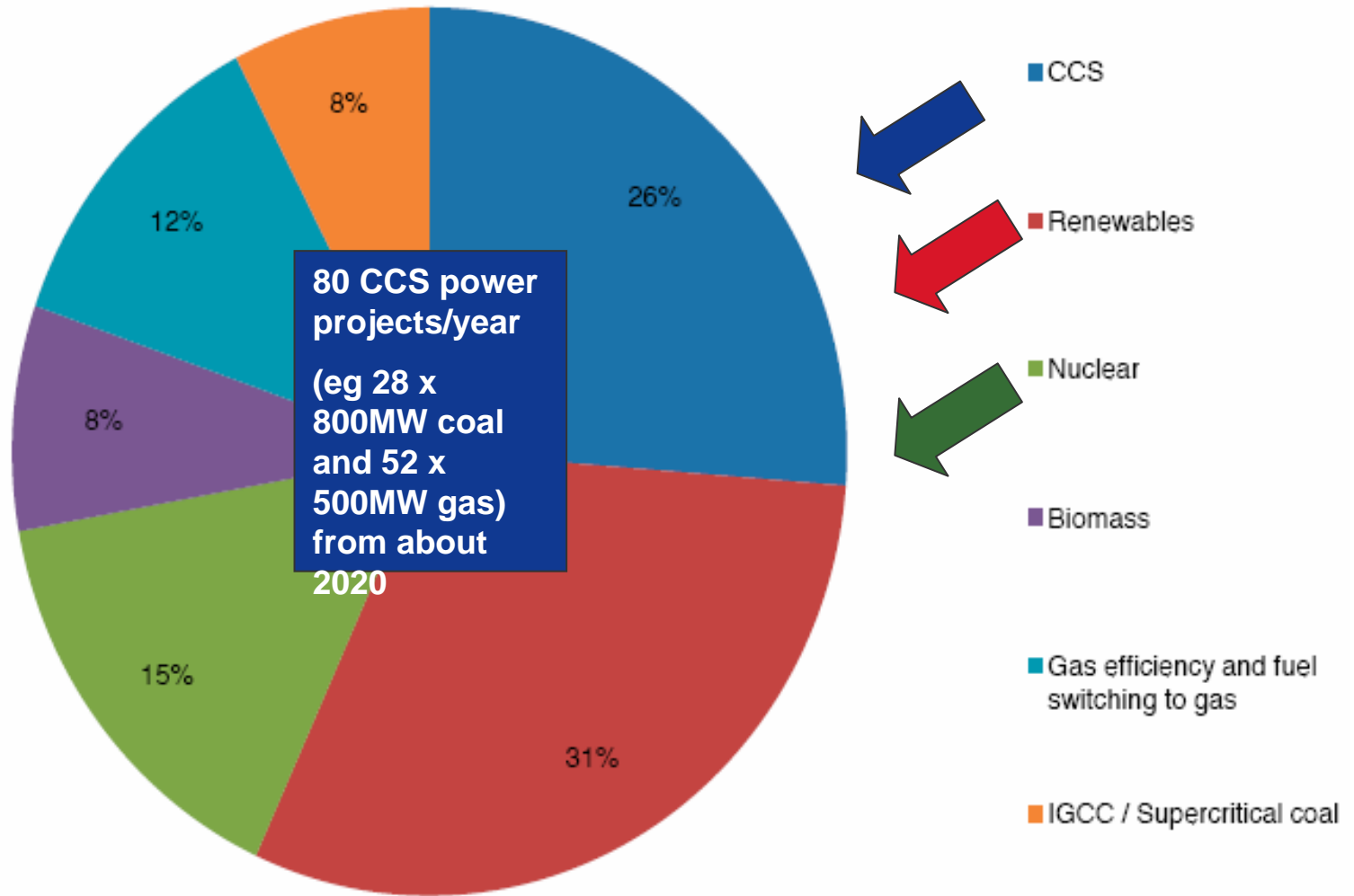
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# The scale of the challenge for target emissions reductions (UKCCC)



Source: UK National Atmospheric Emissions Inventory (2008).

# Global power generation abatement in 2050 (IEA BLUE Map scenario)

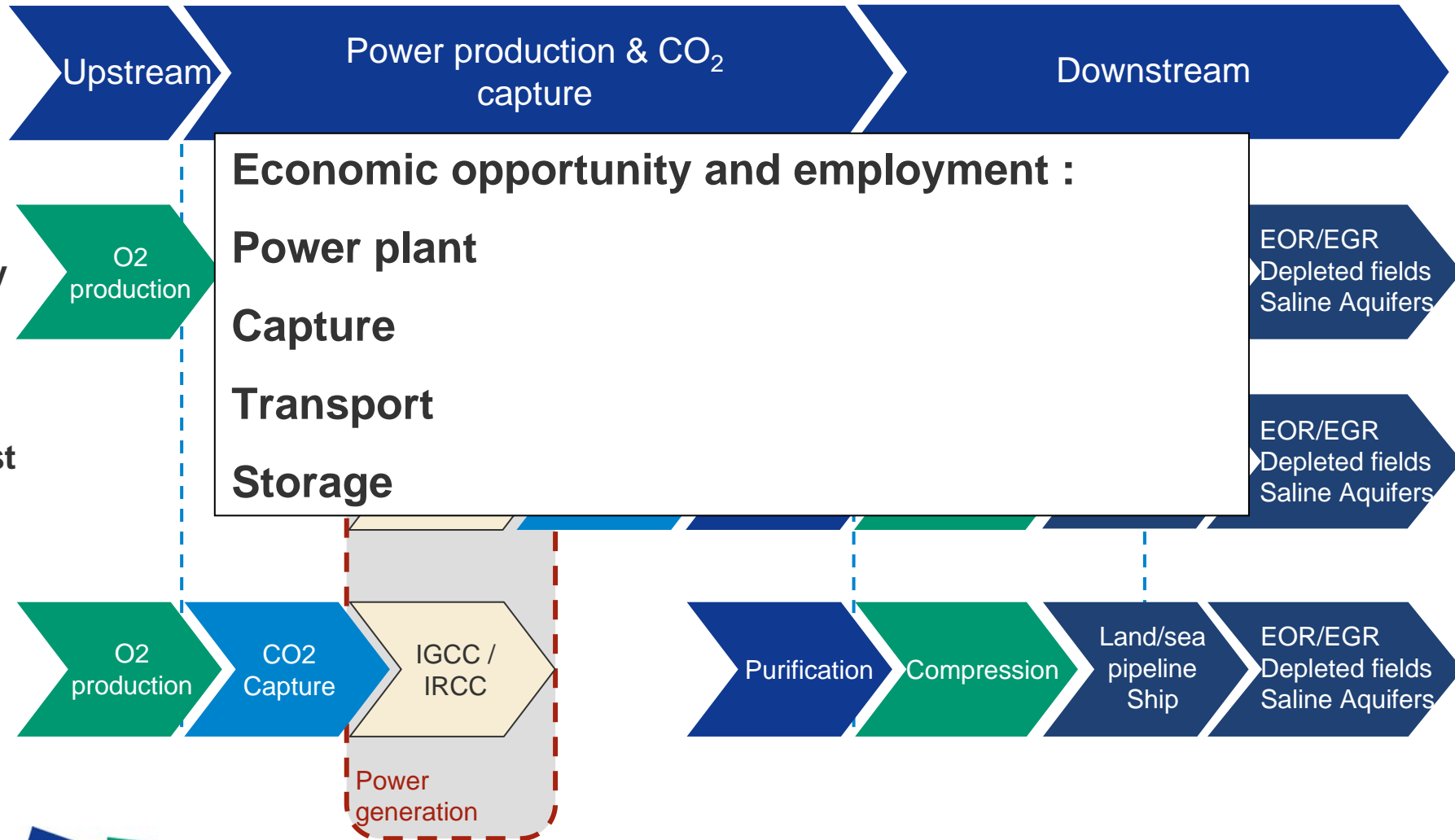


Power sector abatement: 18.3 GtCO<sub>2</sub>

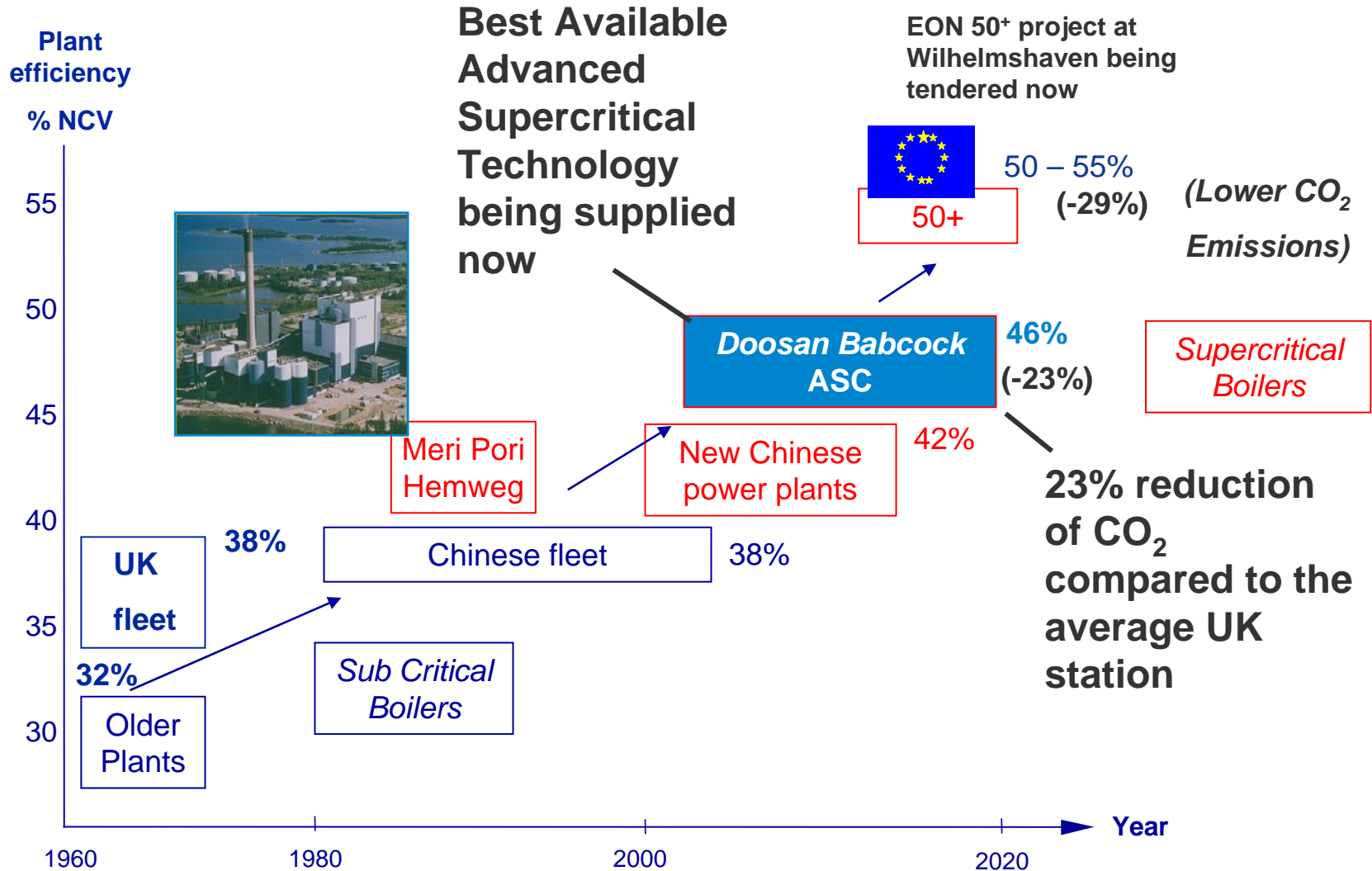
## Green Growth – the opportunities in clean coal and CCS

- **UK power plant equipment suppliers, process engineers and oil and gas sector service companies are well placed to support the roll- out of CCS globally, .... if they first build up experience through the UK demonstrations**
- **The CCS industry will be a comparable in size with the oil industry.**
- **Investment in new coal and gas power plants and CCS will generate many tens of thousands of quality, long- term professional engineering and skilled craft jobs plus jobs in legal, financial and consultancy services.**
- **This is an “industry of the future” worthy of government support, key to the BERR Low Carbon Industry Strategy**

# Power Plant + Capture + Transport + Storage



# High efficiency Pulverised Coal Plant



# Post Combustion Capture

Doosan Babcock have an agreement with HTC Pureenergy of Canada to licence technology for post-combustion capture of CO<sub>2</sub>.

Doosan Babcock will offer the technology to its customer base globally

FEED studies now underway

Amine scrubbing being added to Renfrew test rig



Test Facilities at Boundary



Complete  
r  
Column,  
n, 12 ft-  
6 in ID  
x 77 ft  
high



2008 Demonstration at SV Minerals - 50MW, includes new solvent (RS1), new packing material strategy, steam reduction

CCS1000 Modular Design



# Oxyfuel capture

Target is to develop a competitive oxyfuel firing technology suitable for full plant application post-2010

- **Phase 1:**

**Fundamentals and Underpinning Technologies**  
(2007 -2008)



- **Phase 2:**

**Demonstration of a OxyCoal Combustion System**  
(2007 - 2009)



- **Phase 3:**

**Reference Designs**  
(2009 - 2010)



# Doosan Babcock's global business – and opportunities for CCS



- Worldwide References

- Subcritical 122,000 MWe
- Supercritical 40,000 MWe
- TOTAL 162,000 MWe

## Technology base for Doosan Babcock's business

- **Much of the company's business has resulted from technological developments in anticipation of government requirements and this strategy has been reinforced since Doosan's acquisition of the company in 2006.**
- **We seek to use our experience of introducing new technologies to help the government and its agencies to accelerate the introduction of clean coal technology including CCS as part of a balanced energy portfolio**
- **Technology is essential to our business but not enough, It needs to be followed up with policies and actions by governments and investment in capacity and skills by companies like Doosan Babcock**