

# The Carbon Trust – investing in a low carbon economy

Montreal Climate Change Workshop

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Making business sense of climate change



# Moving to a low carbon economy is a business opportunity

- The net impact on global GDP growth likely to be positive over the long-term
- However there will be a massive switch in investment away from high to low carbon technologies
- This transition presents tremendous opportunities in rapidly growing global markets
- 5 energy companies spent £56bn in 2002 on hydrocarbon assets (Shell, BP, RWE, Eon, Exxon)
- Actively developing a low carbon technology sector could allow UK to capture a greater share of the value created
- Policy frameworks must be conducive to business investment by lowering risk and maximising opportunity

# The Carbon Trust

- Set up in 2001, we are an independent UK-wide not-for-dividend company
- We cover innovation in all sectors and energy efficiency in business and the public sectors
- Our funding in 2005 is £75m and we have 140 staff
- We can be flexible with public funds using grants, loans and equity as well as information and advice
- We allocate our resources solely on the basis of cost effectiveness (£/tCO<sub>2</sub>) over time
- We use our market insights to help develop and guide policy

# Our activities support the deployment of both new and existing low carbon technologies



## **Direct engagement**

Customised services  
Energy efficiency for business and municipalities  
On-site surveys  
Design Advice

## **Indirect engagement**

Helpline, website, publications, events  
Sector, technology and professional bodies

## **Financial incentives**

SME loan scheme  
LA financing  
ECA scheme



## **RD&D**

Carbon Vision  
Open call RD&D

## **Technology acceleration**

Marine Energy Challenge  
European Marine Energy Centre (Orkney)  
Small CHP field trials  
Smart metering trials

## **Investment**

Incubators  
Venture capital  
3<sup>rd</sup> party funds



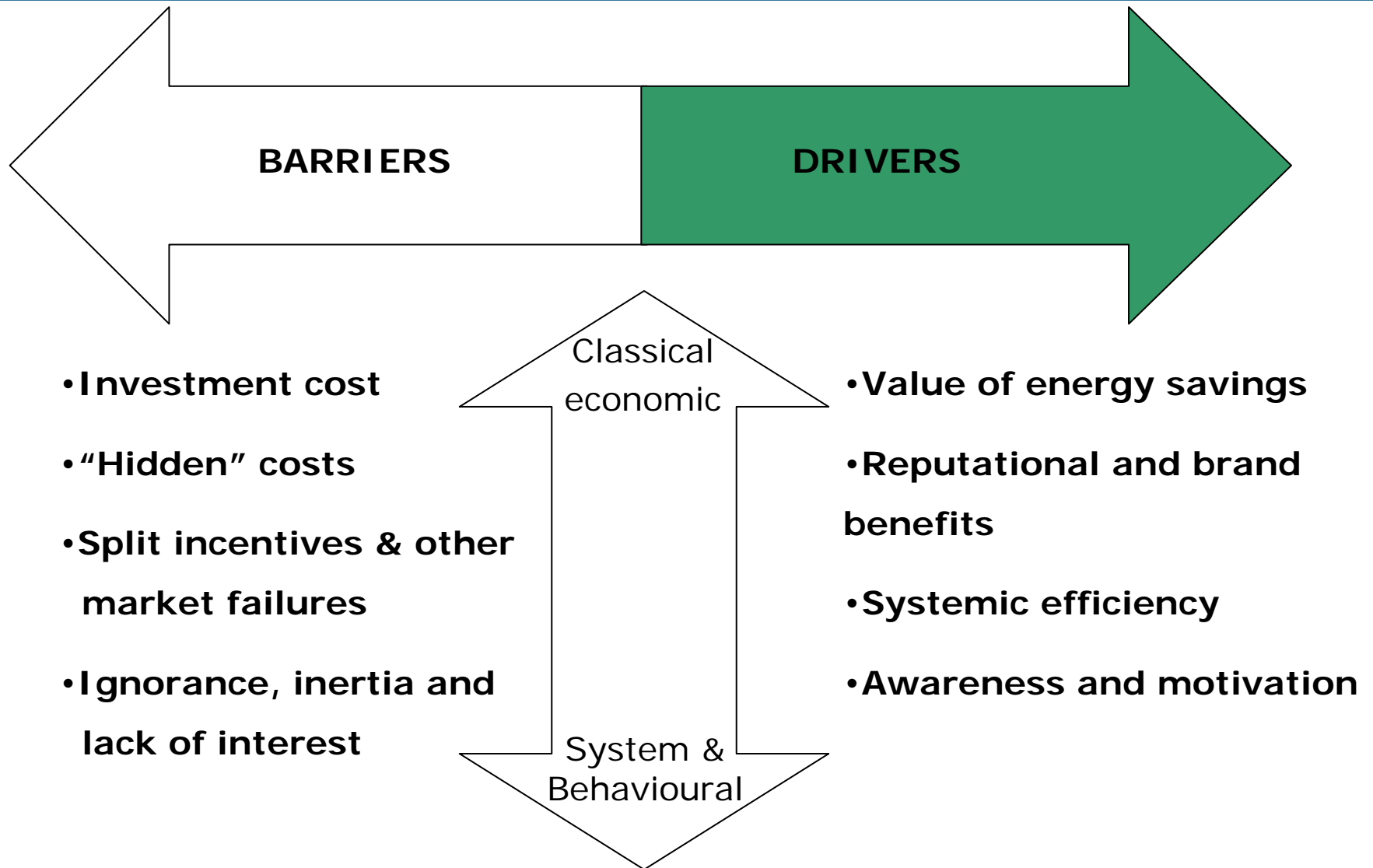
**Transatlantic Investment Initiative with CEG, Mar '05**

**DTI Renewables Innovation Review, February '04**

**Investor perspectives on renewable power in the UK, December '03**

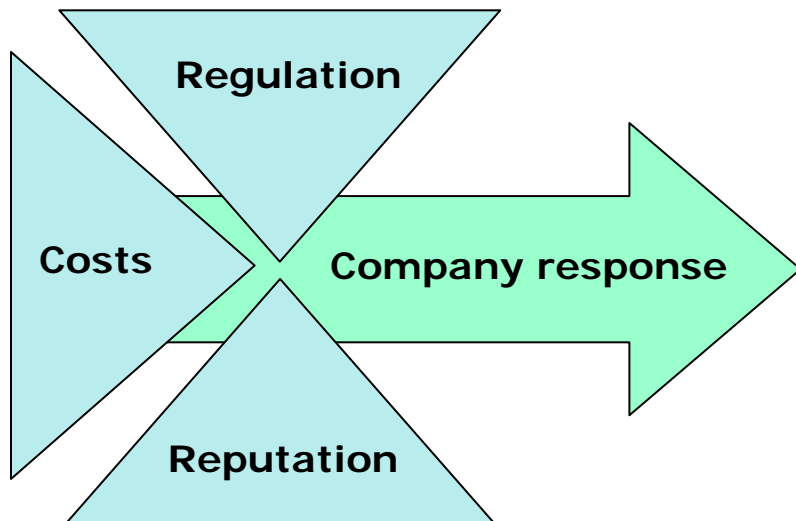
**The European Emissions Trading Scheme: Implications for Industrial Competitiveness July '04**

# Delivering energy efficiency addresses the factors that drive and impede organisational decision-making



# Efficiency programmes must address the business risks and opportunities of climate change

Increasing pressures ...



... create opportunities to

## **Reduce Costs**

- Reduce energy bills through energy management – important as prices set to rise by up to 40%
- Improve operational effectiveness

## **Minimise Impact of Legislation**

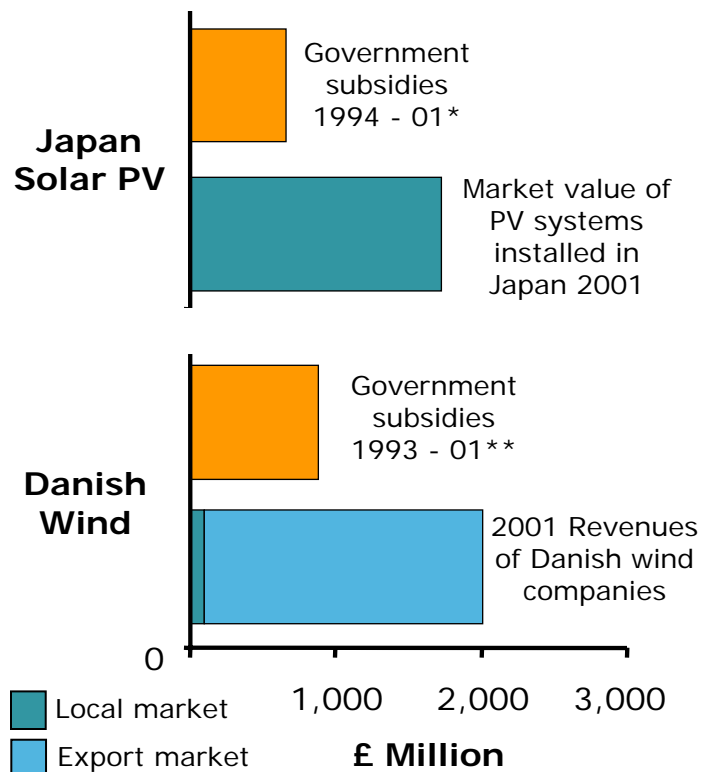
- Respond to and prepare for Climate Change legislation eg: EU ETS, new building regs., new product standards

## **Enhance or Maintain Reputation**

- Maximise brand & reputational impact of reducing carbon emissions

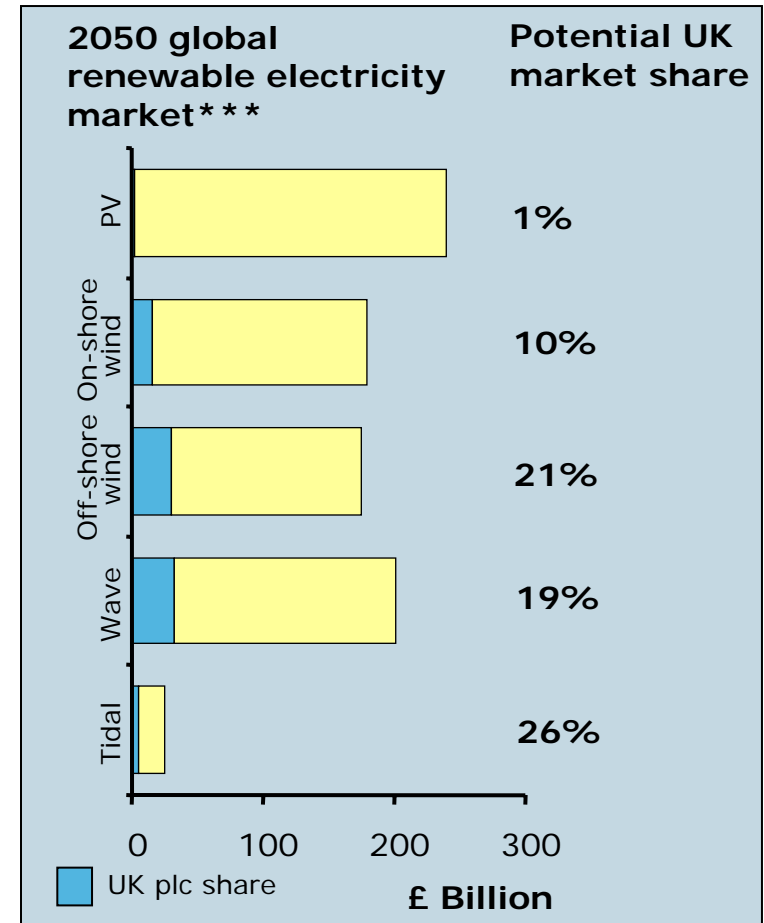
# Low carbon technologies can create economic value if productive resource is leveraged

## Effectiveness of Government subsidies in the solar PV and on-shore wind markets



### Rationale

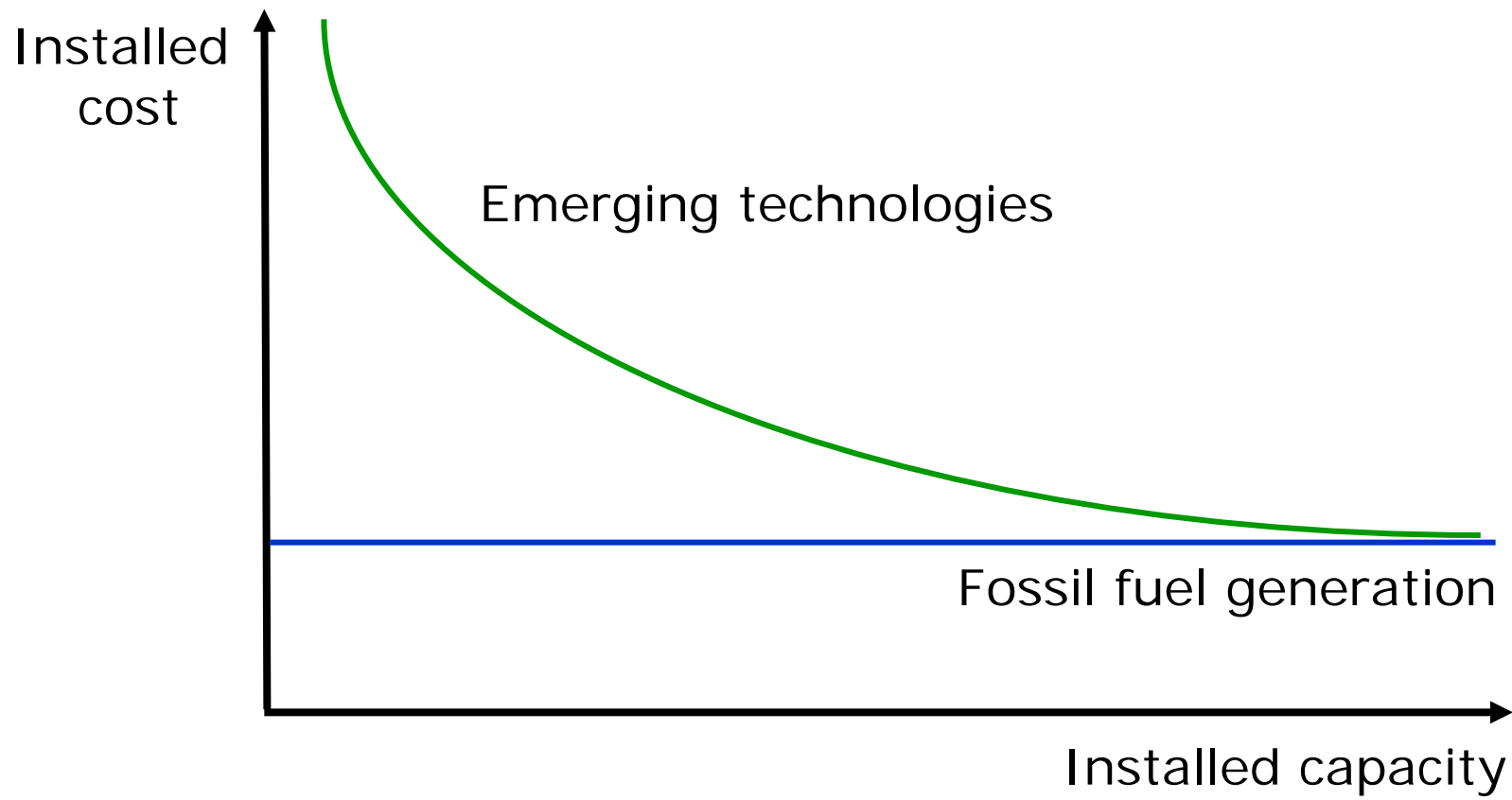
- Japan has leading high-tech manufacturing industries
- Japan has acute security of supply concern
- Leverage local Danish engineering experience
- Create a valuable, export industry in low-cost renewable technology



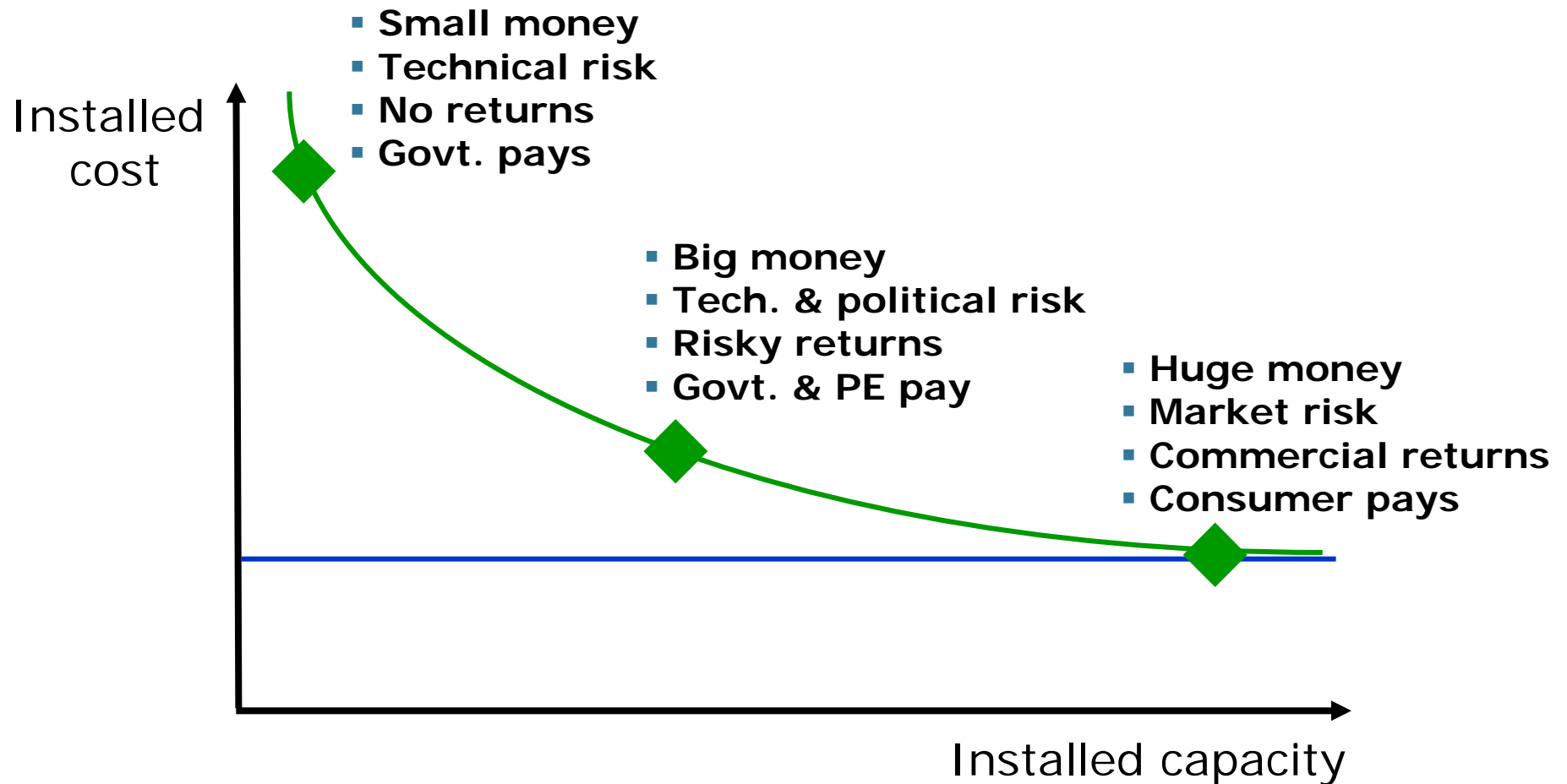
\*10% of subsidies for introduction of other energy programmes have been assumed to go to PV, Exchange rate used as of 10/4/2003, \*\* 1993-1998 OECD estimates; 2001 business Week estimate, linear growth assumed between 1998 – 01, \*\*\* Based on undiscounted cumulated installed capex and opex revenues, taking into account IEA and PIU experience cost curve predictions. Estimates of UK share are from Carbon Trust workshops with industry experts.

Source: IEA; NCPV; OECD; Danish Wind Energy Association; Business Week; L.E.K. analysis; BTM Consult, Gross, WEC, Carbon Trust analysis

Costs of emerging technologies will reduce with experience and scale

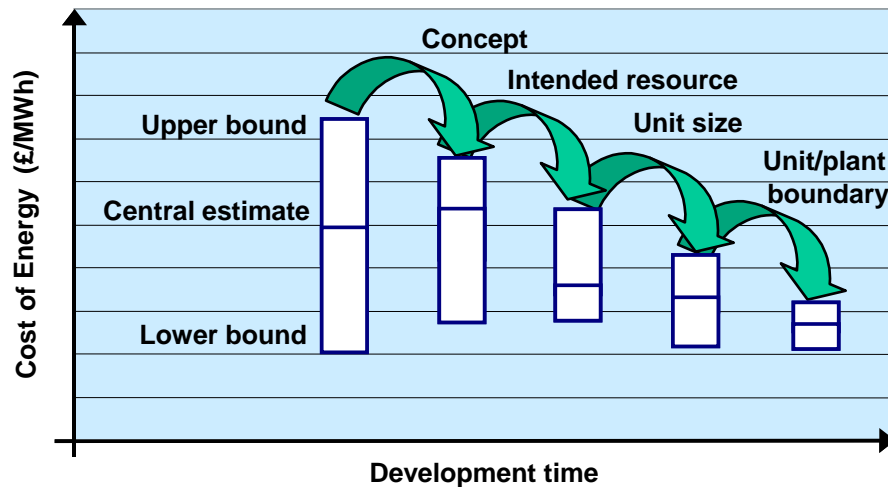


# Costs of emerging technologies will reduce with experience and scale



# The Marine Energy Challenge has significantly reduced the cost of generation through engineering and design improvements

## Anticipated Improvement Steps



The MEC considers design changes in:

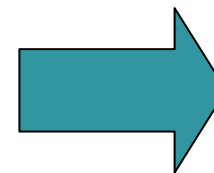
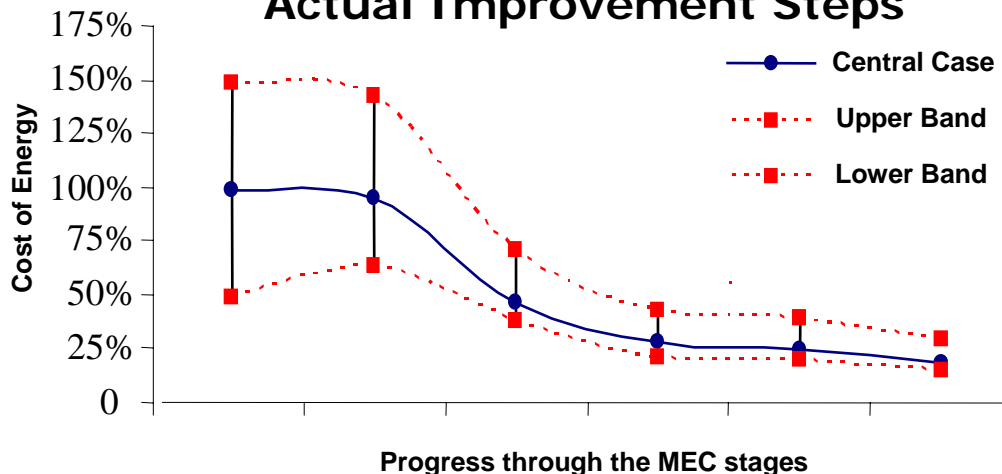
**Concept** - radical changes to conceptual design to reduce 'embedded' cost

**Intended resource** – match device design to conditions for best performance

**Unit size** – optimise size for best performance; some can't be built too big

**Unit/plant boundary** – share equipment and change plant size to reduce cost

## Actual Improvement Steps



Cost of energy reduction of 75% for Device X for a 30MW first array\*

\*Note objective is to achieve step change in cost of energy before economies of scale

# Making Business Sense of Climate Change



# Policy should accelerate the development of new technologies to bring down their cost

