

RENEWABLE ENERGY WORLD MARKETS PROSPECTS 2001-2010

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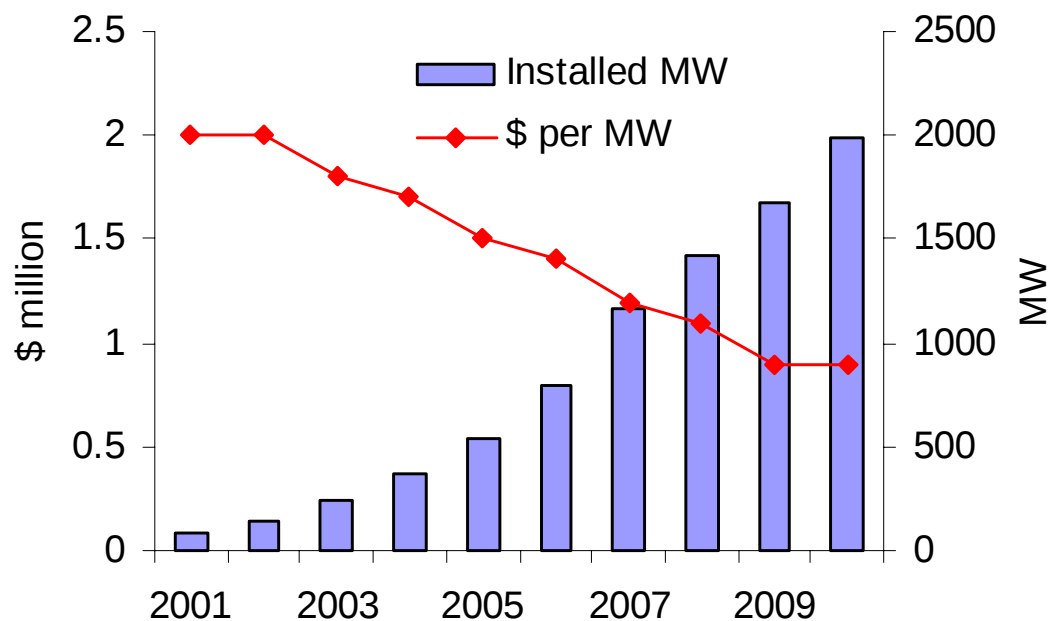
Q1 - WHY should offshore industry firms be interested in renewable energy?

- European offshore capex is in long-term decline
- Renewables are a long-term growth industry
- Possibilities for skills transfer to this 'new' sector
- A ten-year global market of \$272 bn

Q2 - WHAT is driving the renewables markets?

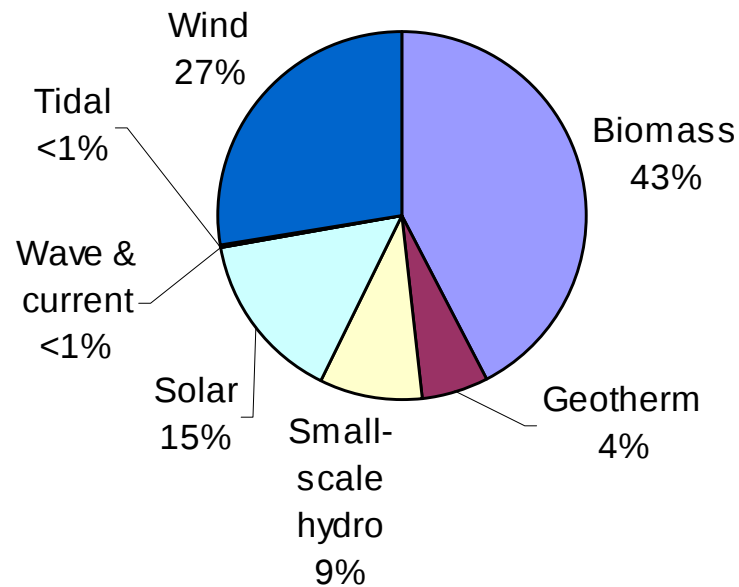
- Environmental concerns - OECD countries
- Growing energy demand - developing economies
- The green consumer
- Economics - renewables costs/MW declining

wind power \$/MW



Q3 - WHERE are the growth prospects?

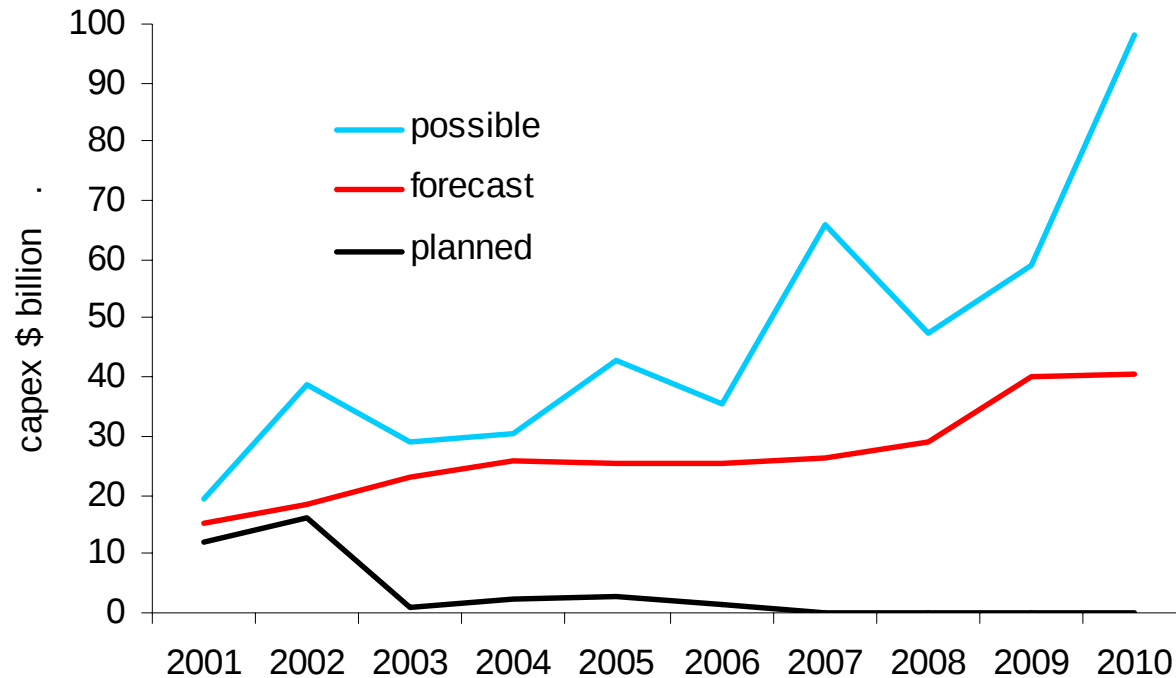
- Five sectors will dominate the \$272 bn market (2001-2010)



\$ capex 2001-2010

CORPORATE HEALTH WARNING

beware the hype - 'possible' is not a forecast



all dates are year 'onstream'

source: 'The World Renewables Report' Douglas-Westwood

BIOMASS - \$116 bn capex- biggest renewables sector

- Already 15% of world energy supply?
- Co-firing offers low additional cost
- Gasification more efficient than direct combustion



Greyley US: wood-fired



Ely UK: straw-fired

India: multi-fuel programme

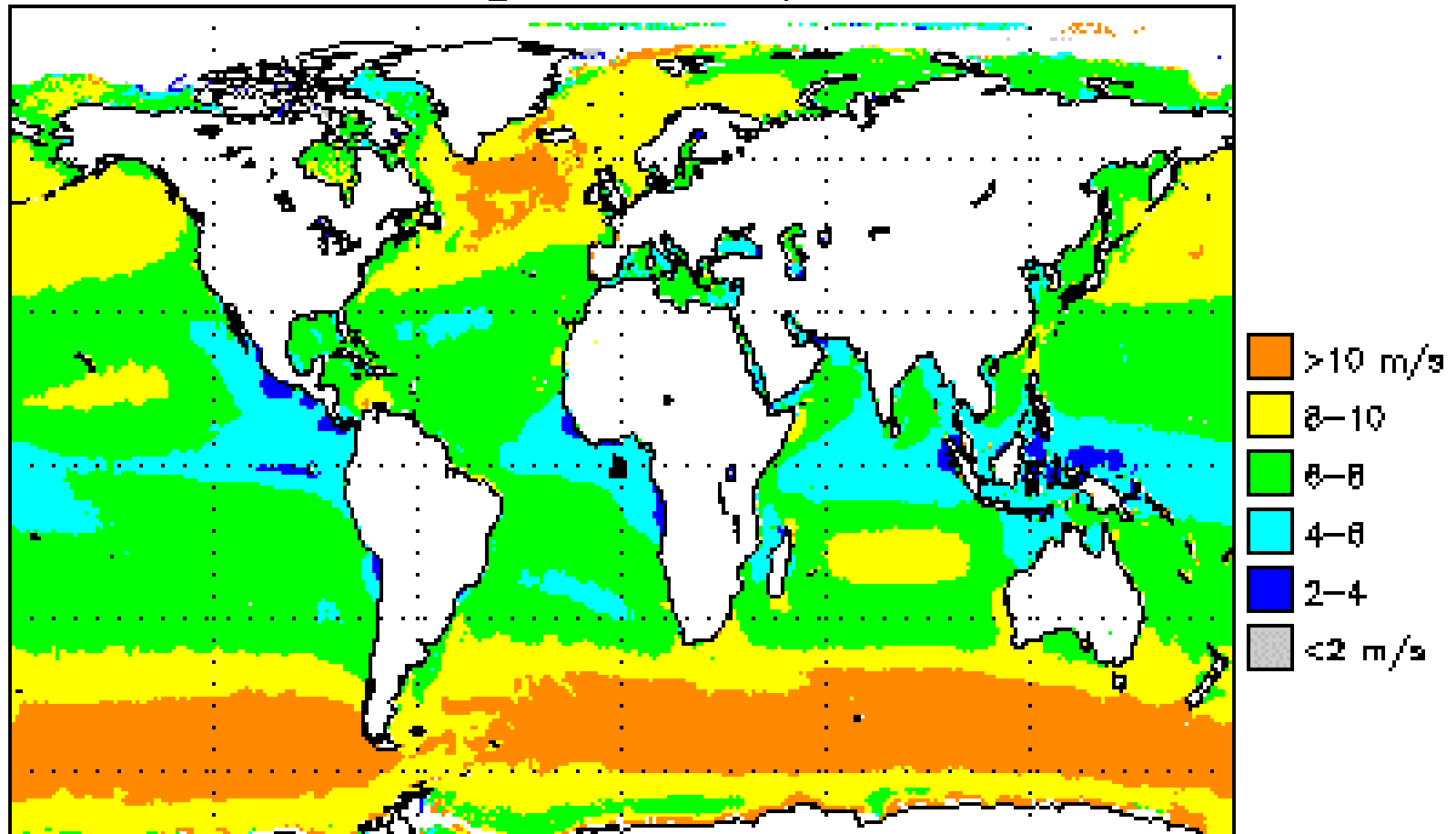


WIND (ONSHORE & OFFSHORE) - \$72 bn capex

- High growth >30% p.a. (electrical)
- Largest market, now - Europe, future, USA
- Problems - good wind v. easy grid connection

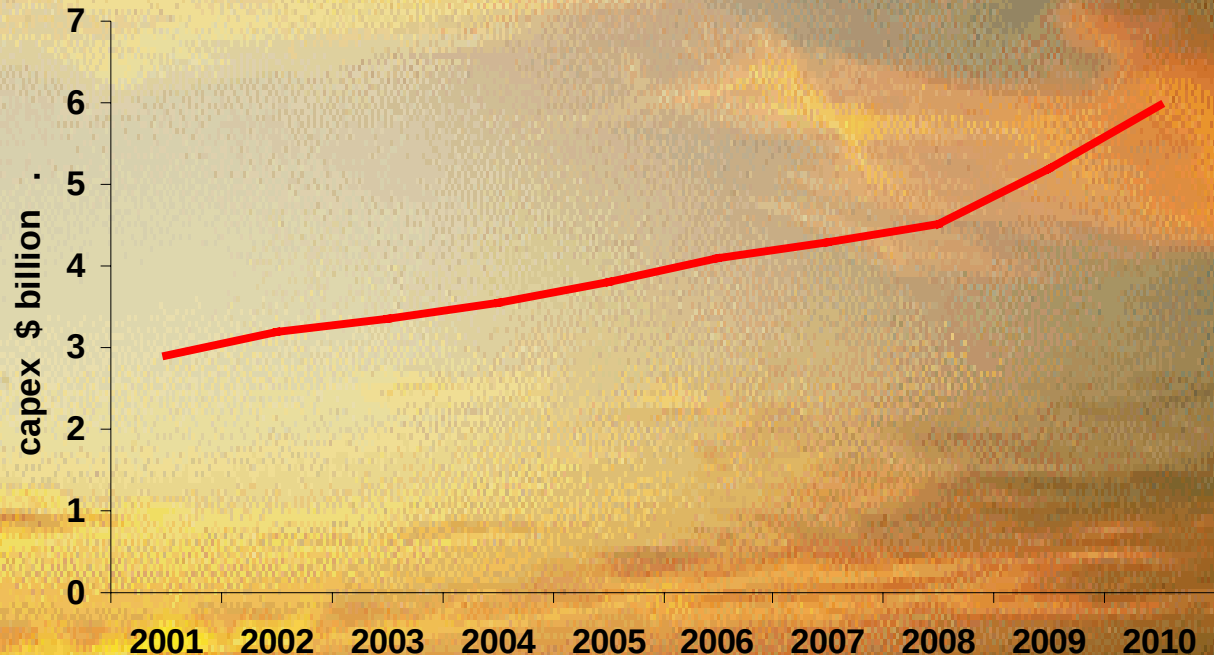


Average wind speed



SOLAR - \$41 bn capex

- Two sectors 'Active' (PV) & 'Passive' (heat transfer)
- PV - large markets, particularly in remote locations
- Passive - solar heating - established
 - solar thermal electricity - pilot schemes underway
- Major energy cos. involved (e.g. BP, Shell)



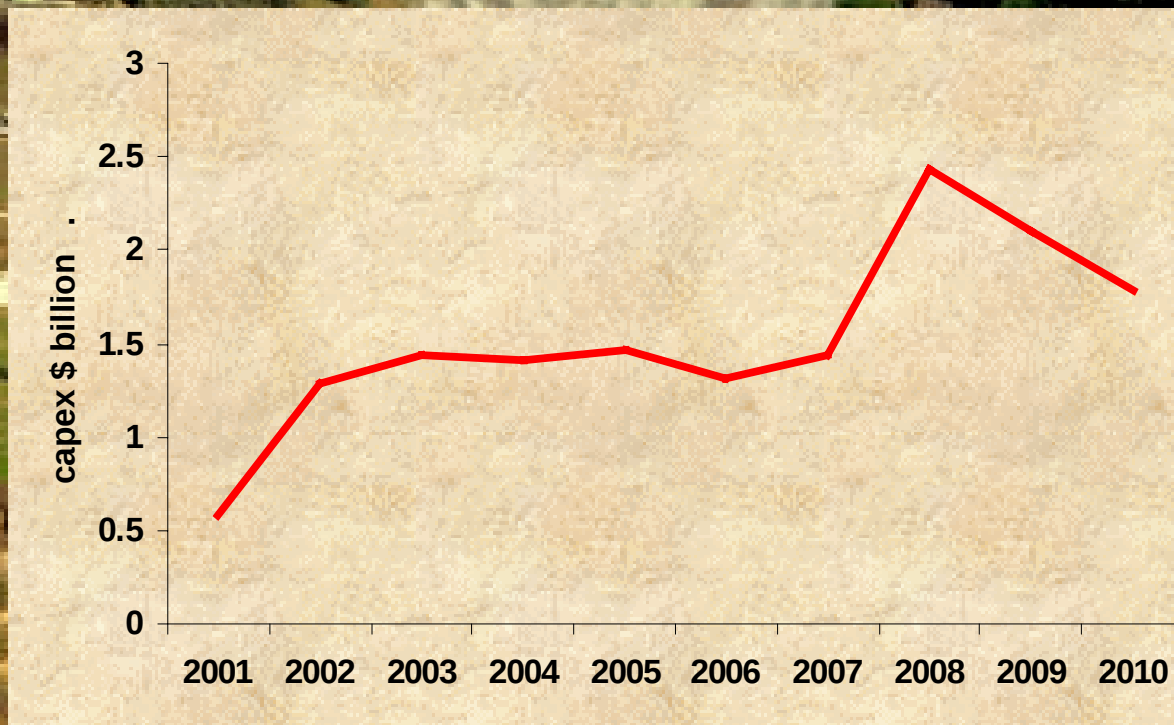
SMALL SCALE HYDRO - \$41 bn capex

- SSH is <10MW. Mainly based on partial flow diversion
- One of the earliest forms of energy generation
- 38 GW presently installed worldwide
- More efficient technology is transforming the market
- Major manufacturers (e.g. GE) involved



GEOHERMAL - \$15 bn capex

- Geothermal reservoirs distributed worldwide
- Major prospects in Europe, Asia & USA (largest?)
- Main types - hydro-thermal & earth energy (e.g. hot dry rock)





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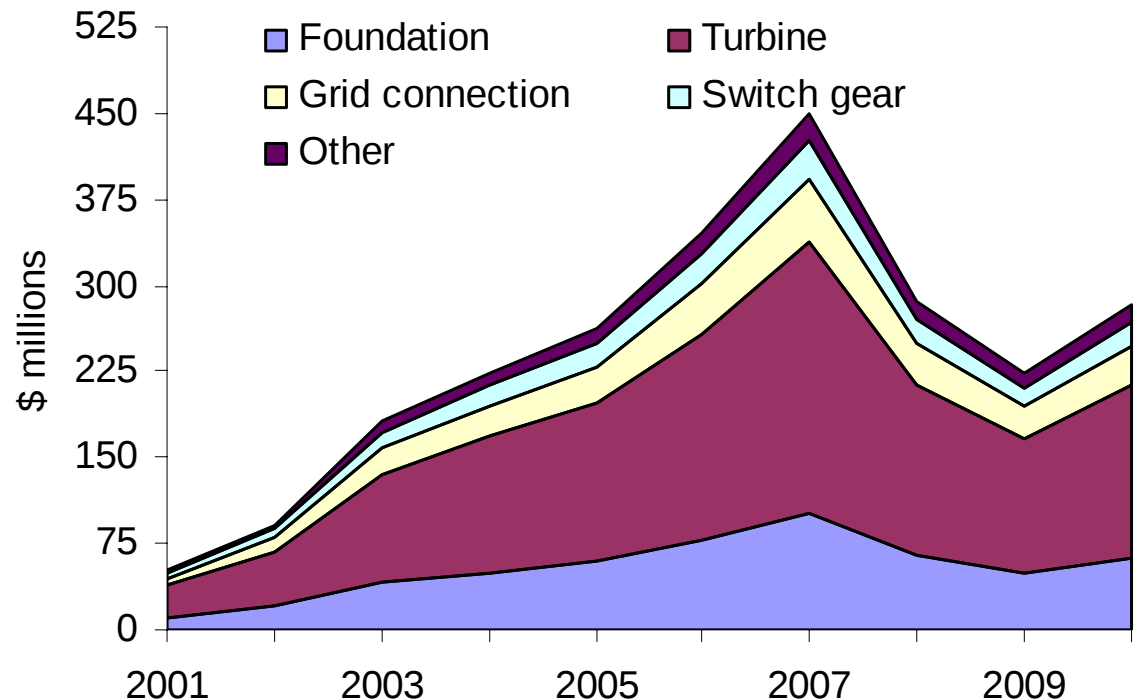
THE OFFSHORE SECTOR

OFFSHORE WIND - \$2.4 bn capex

- Strong growth but from small base
- Best sites used up first
- Second phase (<5 MW turbines)
- Europe (UK) biggest market prospects
- Shortage of economic installation resources?

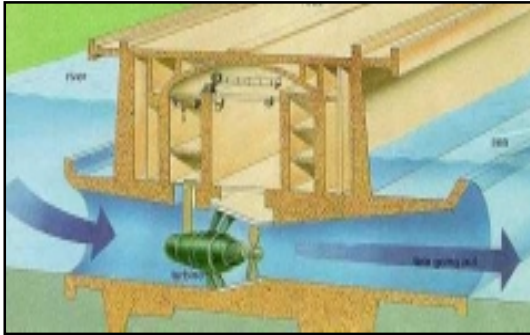


24 Oct 2001



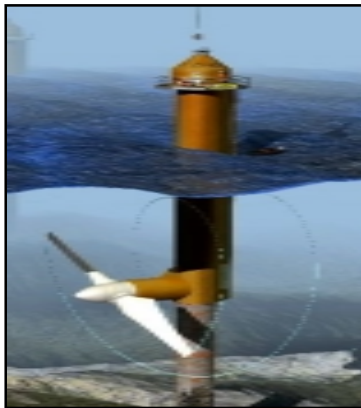
TIDE, WAVE, CURRENT - \$0.74 bn capex

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Tidal Barrage

- considerable potential, but major environmental impact
- <240 MW (Rance)



Tidal Turbine

- many prospective sites
- 200 MW units operating, <5mW proposed.

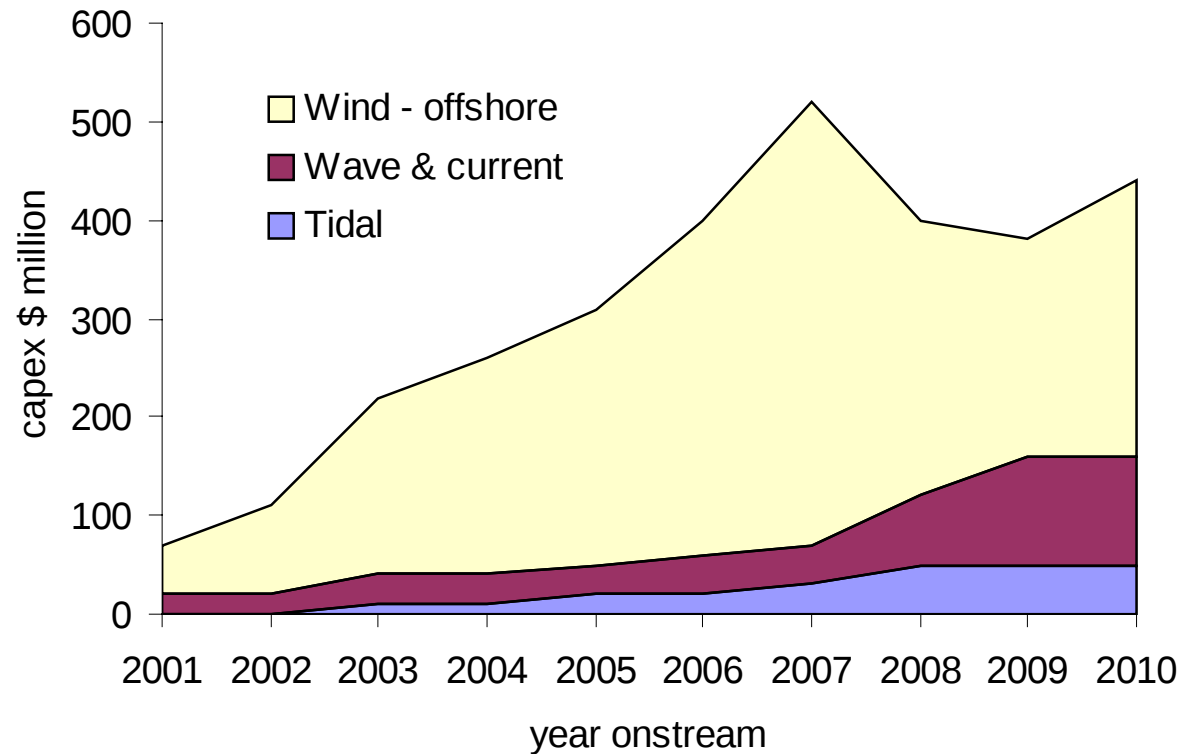
Wave Power

- < 8MW
- wt <1,000 t, SPM





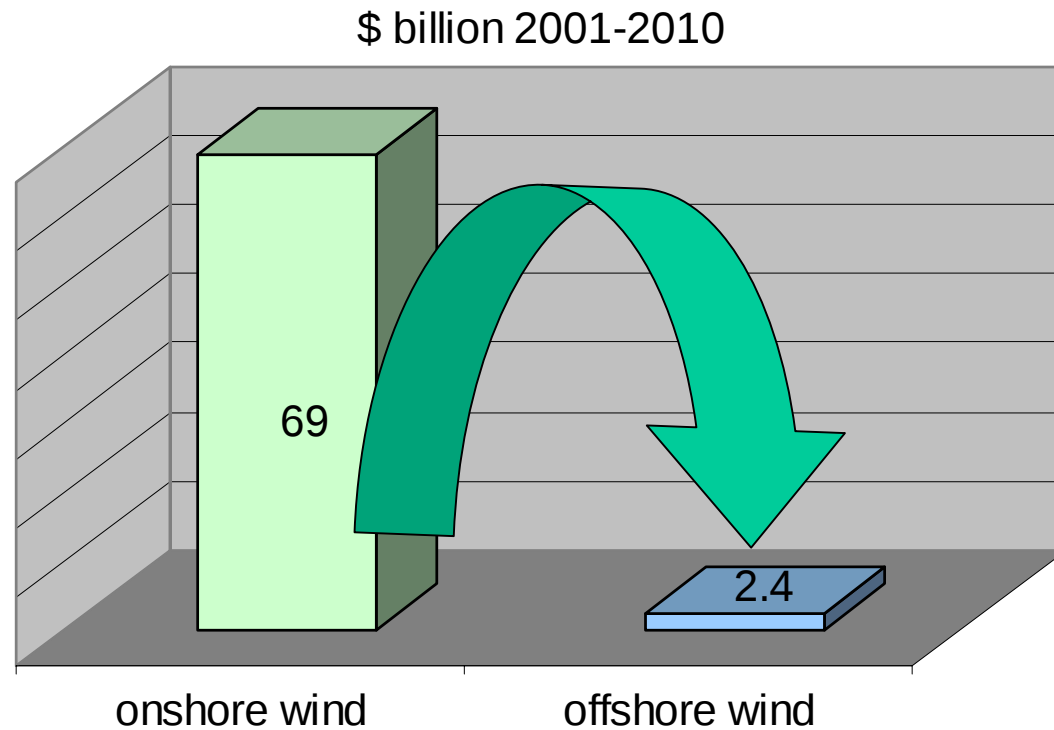
THE OFFSHORE MARKET



+ drilling (geothermal)

+ diversification into onshore renewables <10 x bigger!

KEY OPPORTUNITY - MOVE WINDPOWER OFFSHORE



Conclusions - offshore renewables

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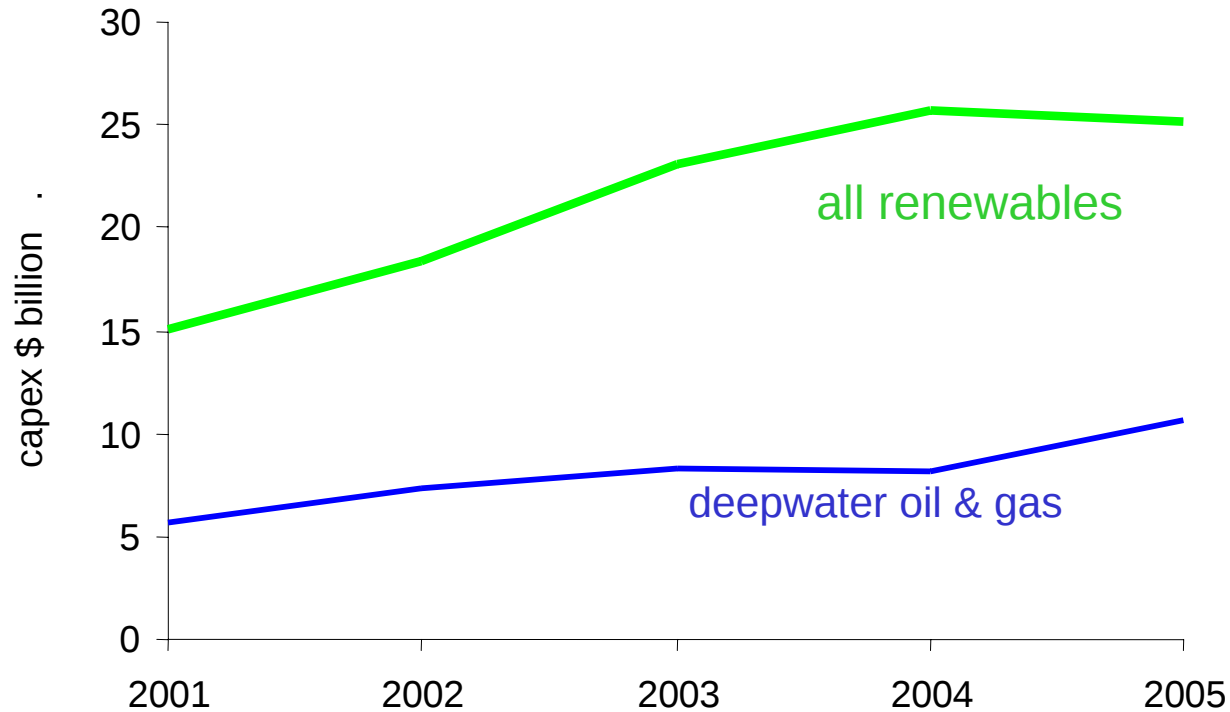
- offshore sector - small base but good growth potential
- offshore wind - largest prospect
- good prospects for existing offshore expertise
- not enough offshore know-how has been applied
- a need for cost-reducing solutions
- plus drilling (onshore geothermal)
- major market for 'conventional' equipment & services
- opportunities to develop existing relationships?
- early entrants could take long-term market share

Conclusions

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- massive potential if onshore wind moved offshore
- political will is needed to effect the transition
- a need to move out of 'R' into 'D'
- the upside could be much greater than we forecast
- vast reserves with no exploration costs
- could renewables be "The New North Sea"

could renewables be “The New North Sea”



major data source cited

'The World Renewable Energy Report 2001-2010'

'The World Deepwater Report 2001-2005'

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