

Our Vision of Wind Energy (2010)

Wind generated electricity costs will be within the range of conventional power generating sources.....

..... leading to rapid increases in installed capacity

..... supplying approximately 1.5 - 3.0% of world electricity demand



Our Vision for Shell in Wind Energy (2010)

- a leading and influential player (with 10% market share)
- spearheading reductions in delivered electricity costs
- project developer, owner and operator of major wind farms both off-shore and on-shore



Main Features of the Wind Energy Strategy

- A two stage “learning by doing” approach
- Participation in all parts of the value chain as project developer, builder, owner and operator
- Focused Cost Reduction Alliances with designers, engineering component suppliers, equipment packagers and contractors
- Innovative solutions for off-shore wind farms.



Why Shell in Wind Energy?

- A key renewable energy source in core Renewables business
- Helping people build a better world
- Merits management attention
 - big enough opportunity, growing rapidly
 - opportunities for cost reductions
 - “do-able”
 - real projects immediately available
 - risks are controlled / phased
- We can be successful
 - proven ability in focused cost reduction alliances
 - off-shore experience
 - experience in power generation
 - commitment



Project Opportunities

| Country | Project | Capacity [M W] | Total CAPEX [US\$ million] | Shell Equity Share [%] | Comments |
|-------------|------------|-----------------|----------------------------|------------------------|---|
| U K | St. Fergus | 4.5 | 6 | 100 | Electricity supply to St. Fergus gas plant |
| U K | Blythe | 1.5 | 3 - 5 | 100 | Two near-shore turbines as an extension of existing farm on-shore |
| U K | Offshore | ~ 100 | - | - | For next NFFO round of contracts |
| Norway | Lindesnes | 3.8 | 4 | 50 | Due to be operational Sep 1998 |
| Netherlands | Moerdijk | 14 | ? | ? | Could be put on Shell's Moerdijk site. |
| Netherlands | Near shore | 100 | 220 | ? | Private consortium plus Dutch Ministry of Economic Affairs |
| Germany | Offshore | 20 | 30 | ? | Consortium of companies, incl. Nordex/Balcke-Durr |



Negotiating Proposal for Blyth Offshore

- Addition to an existing wind farm (9 x 300kW) on breakwater at Blyth harbour, UK
- Proposed 2 x 1.5 MW turbines 1km off-shore in 8m water depth
- Power purchase agreement at 5.26p/kWh available under NFFO4 for 15 years
- Possible capital grant of £640k under EU THERMIE
- Capex £1.7 - 3.6 m for earning powers 7 - 11%
- No apparent obstacles to consents
- High public profile and benefit to corporate image
- Excellent fit with proposed global wind energy strategy



CMD is asked to support...

- Stage one of the strategy - medium scale wind farms (<15MW)
- A proposal for negotiation of the Blythe off-shore project



Learning points from various wind farm projects

| | | Offshore | Wind Power Value Chain | | | | | |
|--------------------------|-------|----------|----------------------------|----------------|-------------------|--------------------|--------------|-----------------------|
| | | | Project Planning & Permits | Project Design | WTG Manufacturing | Constr. & Installn | Ops & Maint. | Electr Market / Sales |
| St. Fergus | UK | - | ✓ | ✓ | - | ✓ | ✓ | - |
| Blythe | UK | ✓ | - | ✓ | - | ✓ | ✓ | ✓ |
| UK offshore developments | Norw. | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | - |
| Lindesnes (phase 1) | Norw. | - | - | - | - | - | (✓) | - |
| Lindesnes (phase 2) | Norw. | - | (✓) | (✓) | - | (✓) | - | - |
| Sola | Norw. | - | ✓ | ✓ | - | ✓ | ✓ | - |
| Near Shore Wind Park | Neth. | ✓ | - | (✓) | (✓) | (✓) | (✓) | - |
| Moerdijk | Neth. | - | - | - | - | ✓ | ✓ | (✓) |
| Mecklenburg | Germ. | ✓ | - | ✓ | ✓ | ✓ | ✓ | - |
| Harburg | Germ. | - | ✓ | ✓ | ✓ | ✓ | ✓ | - |



Further steps

- Investigation of the feasibility of siting 3 x 1.5 MW turbines at St Fergus gas plant
- pre-qualification of Shell UK team for off-shore NFFO bidding
- Investigation of various other wind farm projects including Lindesnes in Norway and Shell brown field sites



Wind Energy HR planning

- Core team in SIRL (4-6 staff)
- Coordination Focussed Cost Reduction Alliances
 - Outsourcing and assignments: Turbine manufacturers, Wind Power Consultants, Shell Skill pools, Test Centres, Turbine Technology developers, Turbine designers, Equipment manufacturers, Civil Engineering firms
- Project Development Support
 - Business development, Project scouting and feasibility, commercial guidance
- Implementation teams in project area's
 - Outsourcing with Wind Turbine Manufacturers, Engineering firms
 - Operating and maintenance contracting

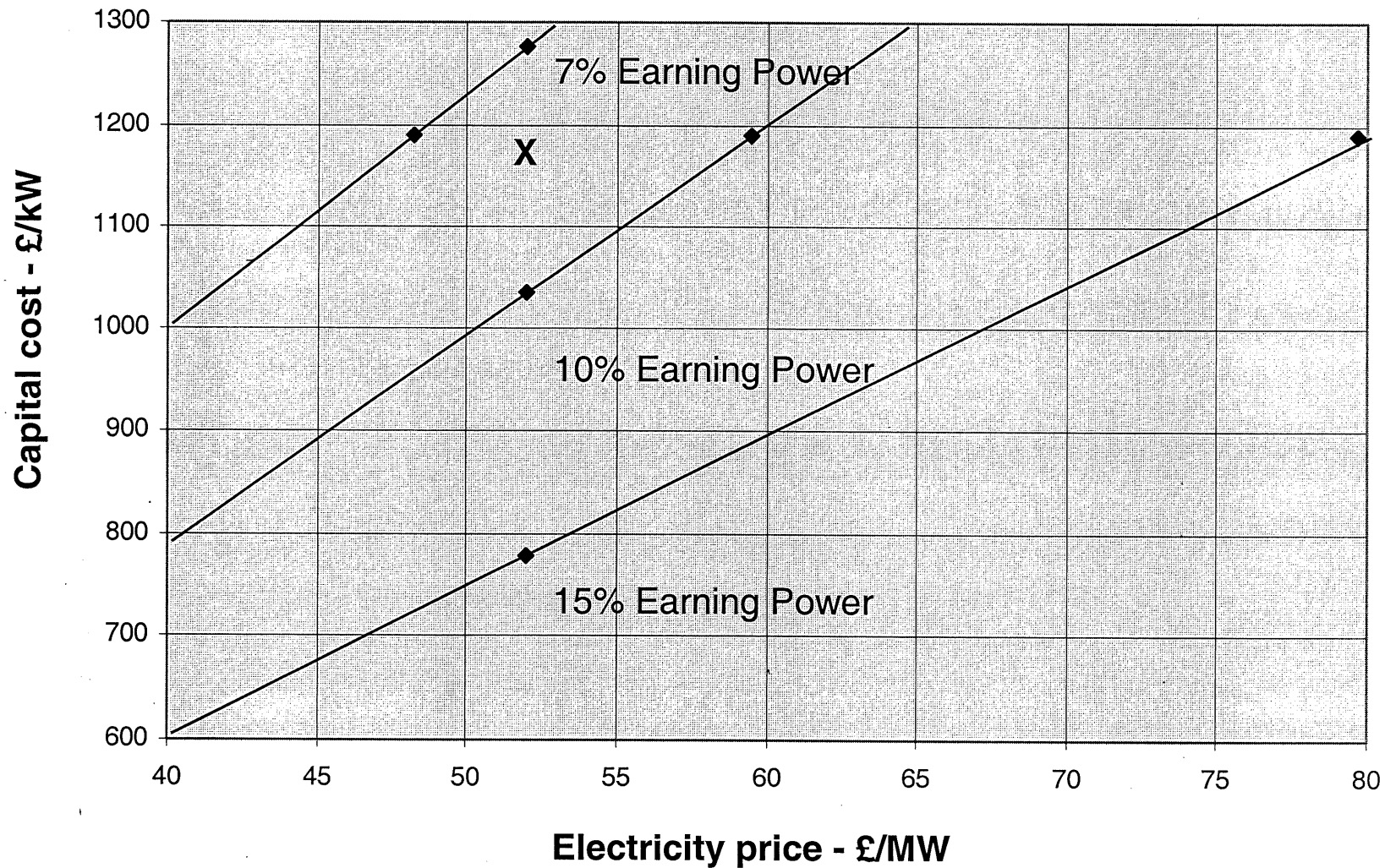


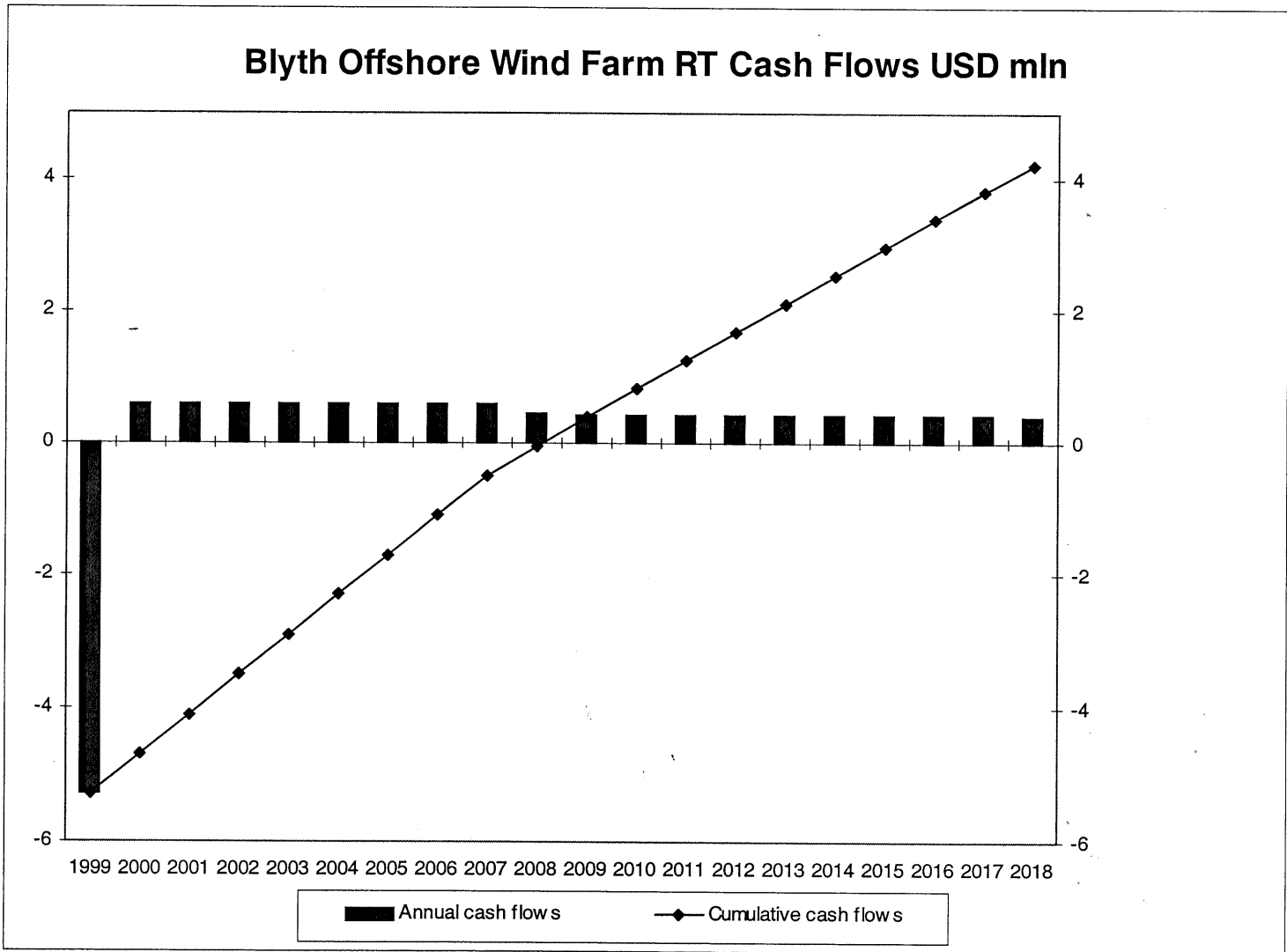
Wind Energy Communications

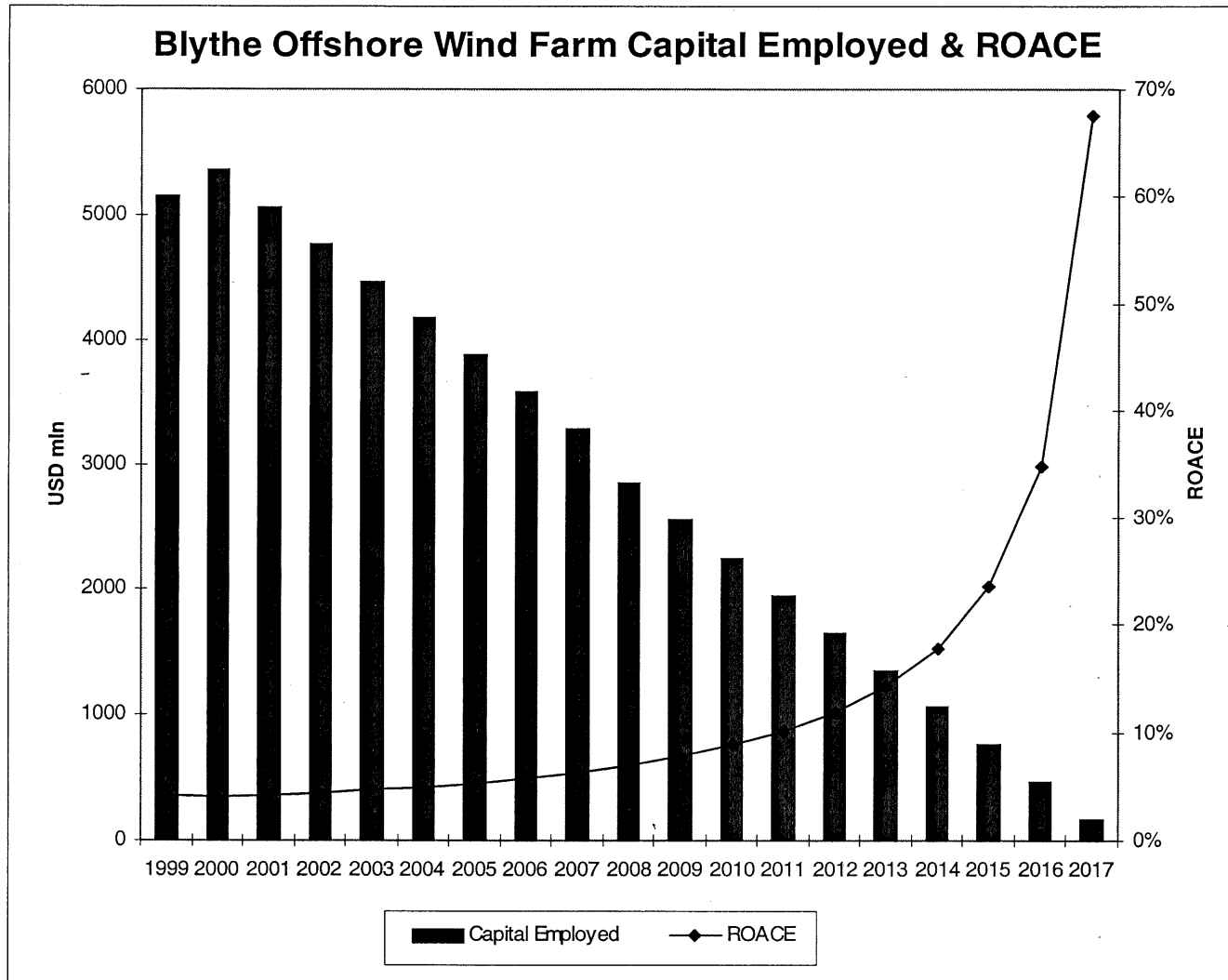
- Exploit reputation value of Shell in wind energy
- Link communications with 'doing' not 'saying'
e.g. Blyth
- Stakeholder analysis already conducted and some consultation planned at international level
- Media relations (PXX) already consulted
- Audiences are both internal and external



Blyth - Capital Cost vs Electricity Price



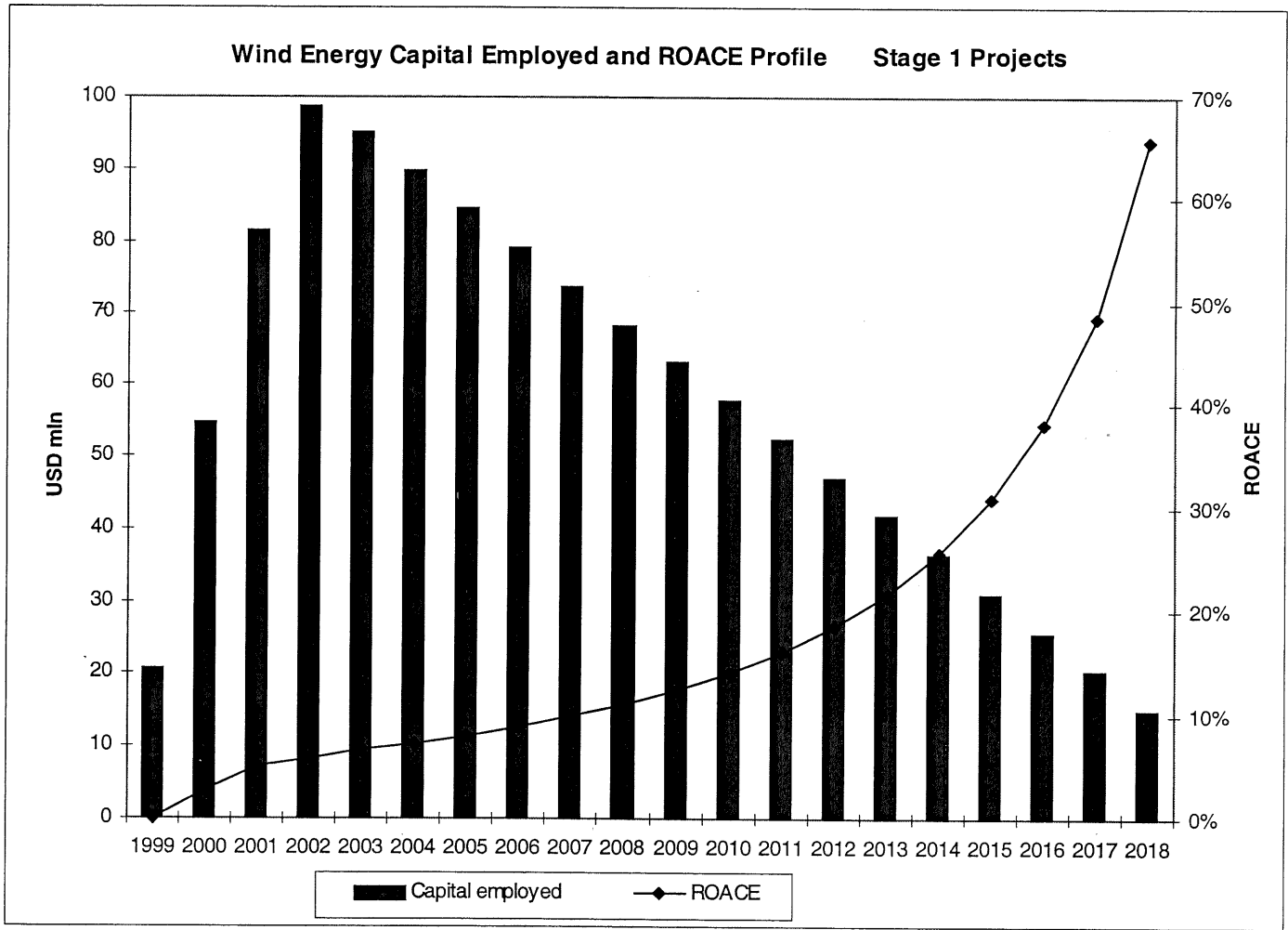


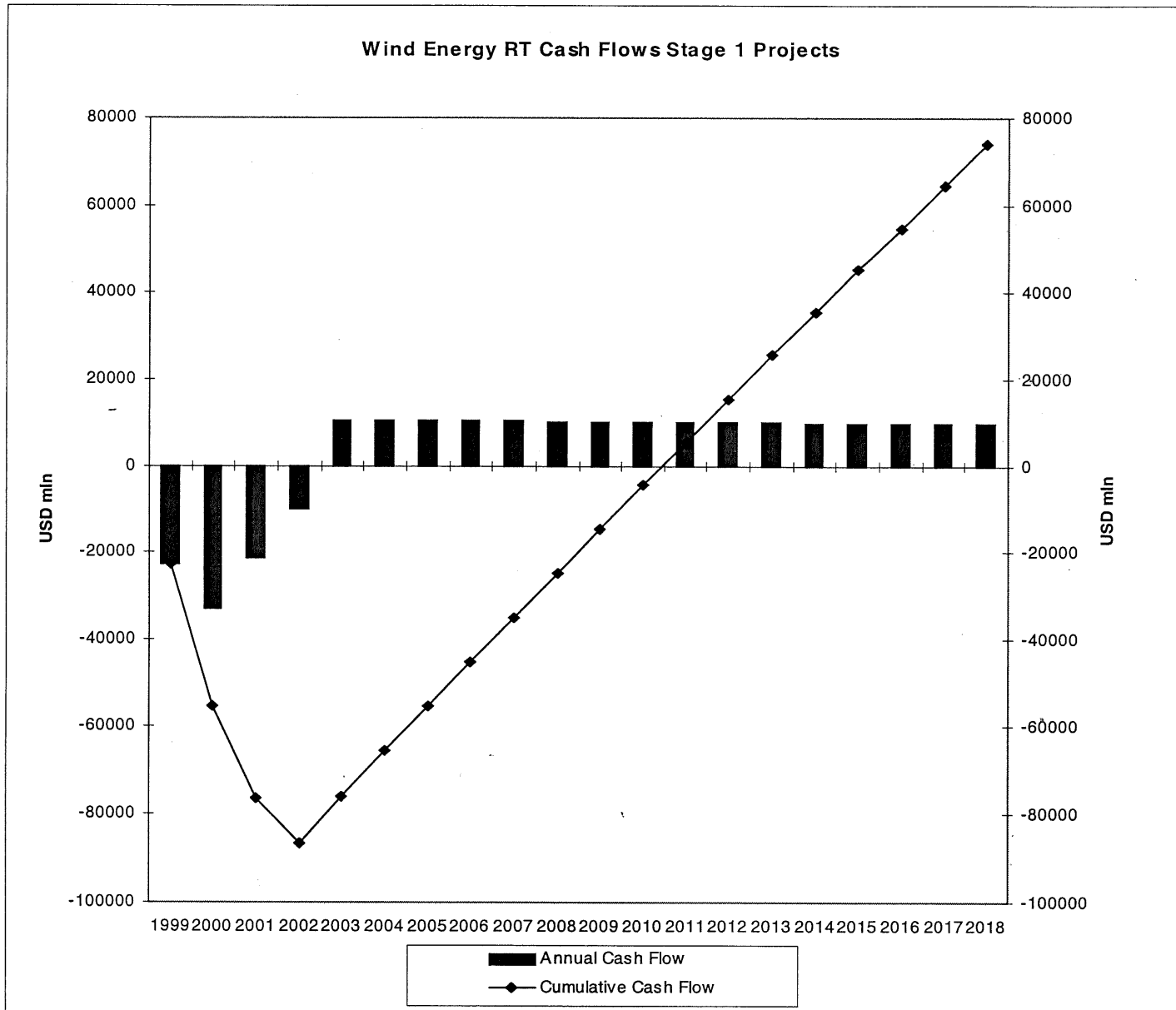


INDICATIVE CASH FLOW PROFILES OF WIND ENERGY PROJECTS

| | Project Life | Cash Flow profile |
|---------------------------------------|---------------------|---|
| Wind Energy | 20 years | Flat Cash flows over projects life |
| Upstream Oil | 12 years | Declining to zero |
| Upstream Gas | 25 years | Declining to zero |
| Downstream Oil & Chemicals | 15 years | Flat Cash flows over projects life |
| Downstream Gas | 25 years | Higher in early years, then flat |







WIND ENERGY PROJECTS- BENEFITS OF GEARING
(Increased capacity, without Grant)

| | Ungeared | Geared * |
|---|-----------|-----------|
| <u>Economics</u> | | |
| NPV(7) GBP 000 | 200 | 529 |
| RTEP | 8% | 12% |
| VIR | 0.06 | 0.3 |
| Payback | 10 years | 10 years |
| <u>Financials</u> | | |
| Capital investment | USD 3 mln | USD 6 mln |
| 100 % basis-average ROACE first 5 years | 4% | 4% |
| 100% basis-average ROACE first 10 years | 4% | 4% |
| JV basis**-average ROACE first 5 years | n/a | 10% |
| JV basis**-average ROACE first 10 years | n/a | 10% |

* Geared case: assume 50% third party non recourse debt over 20 years at 8% interest

* Assume equity accounting with no Group control

