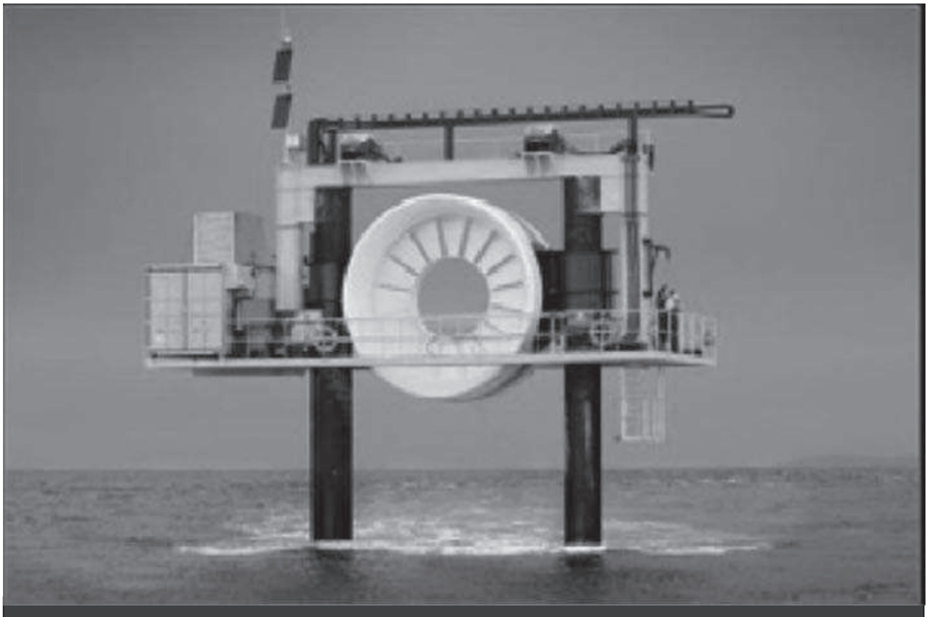

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The University of Hull, Kingston-upon-Hull, UK

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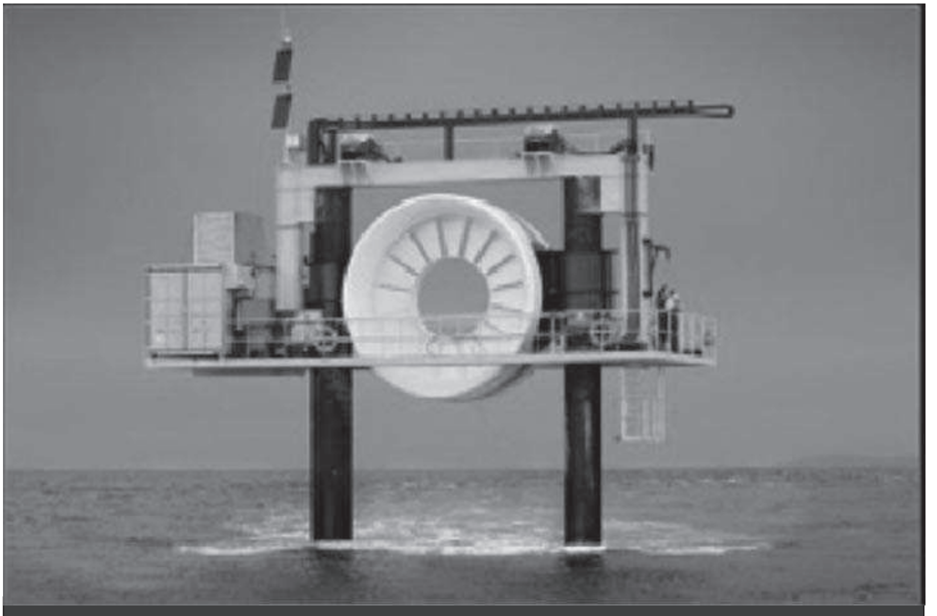

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Preface

I have been engaged in marine environmental research throughout my career, but came latterly to the subject of Renewable Energy. My first contact involved an analysis of the potential for tidal power around the United Kingdom. This appeared straightforward, and 18 sites were identified (most of which are detailed now in Chapter 7) from British Admiralty tidal diamonds, and their hydraulic powers were calculated. The draft report, however, missed the Pentland Firth because there are no tidal diamonds in this very high-current regime. Therefore, when the *DTI Tidal Resource Atlas* was published a few weeks later, it was apparent that the methodology was correct (basic physics) but the results were not. There was much more to this renewable energy business than initially met the eye, and I became addicted. A whole new world of fascinating research problems opened up as we worked for some of the major players such as Lunar Energy, ITPower, Pulse Generation, and Neptune. I strove to maintain academic rigour and peer review in a fast-moving field with a harshly commercial environment. The result is this book, which attempts to set down, for the first time, the fundamental physics behind tidal stream power alongside a global analysis of its distribution and potential.

I have been very fortunate to work with some of the best British practitioners. Thanks are due to Simon Meade at Lunar Energy, Jamie O'Nians and Huw Traylor from IT Power, Pete Stratford (then) from BMT Renewables, Marc Paish from Pulse Generation, Glenn Aitken, Andrew Laver, and Nigel Petrie at Neptune Renewable Energy, and Nathalie Stephenson from Atkins Global. I have also engaged with many industrial and business people including Graham Bilaney, formerly at Dunstons, Stuart Reasbeck at IMT Marine, Ian Mitchell at Ormston, MMS Shiprepairers, David Brown Gearboxes, and the electrical engineers at Sprint and Brook Compton. Much has been learnt from these specialists.

Thanks are also due to many academic colleagues, and to the students who quickly and willingly took up undergraduate and graduate dissertations in Renewable Energy. There is a growing group in Hull University who have taken Research Masters and Doctoral programmes on some of the problems detailed in these pages, including Emma Toulson and the MRes students Tom Smith, Chris Smith, and Paul Jensen. It is an old aphorism, but no less valid that: teaching remains the best way of learning. The colleagues with whom I have discussed much, and among whom we have developed our University's Renewable Energy centre of excellence, include Stuart McLelland, Brendan Murphy, David Calvert, and Professors Lynne Frostick, Tom Coulthard, and Mike Elliott. John Garner drew many of the diagrams herein.

In addition, and for completely different reasons, much of this book was written on the Haemodialysis Unit at Hull Royal Infirmary, and my thanks are due to my consultant, David Eadington, and to the ward staff, particularly Sue Smith and Rita Soames. Writing was initially interrupted and later enhanced by very useful stays in the excellent Renal Transplant Unit at St James' Hospital; thanks are due to the staff there and in, particular, to Mr Ahmed and the team on Ward 59.

Finally, there is my indulgent family; I gratefully acknowledge the help and support of Paul, Tor, Lexie, Lizzie, Annette, and, in particular, my son James for always being there. Last, but by no means least, this book is for Sarah.

Jack Hardisty
East Yorkshire
July 2008

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