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Renewable Energy on the ROCs

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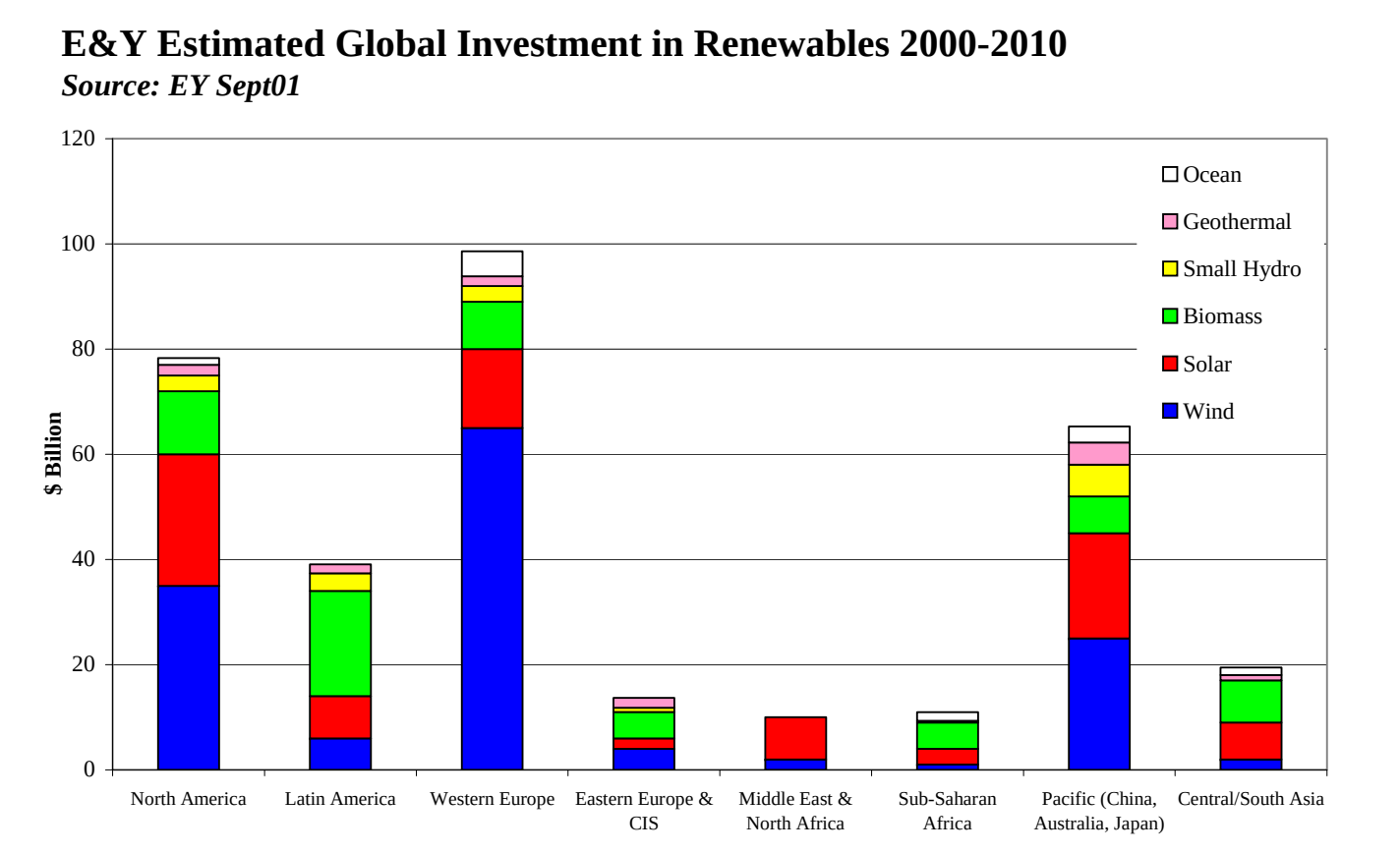
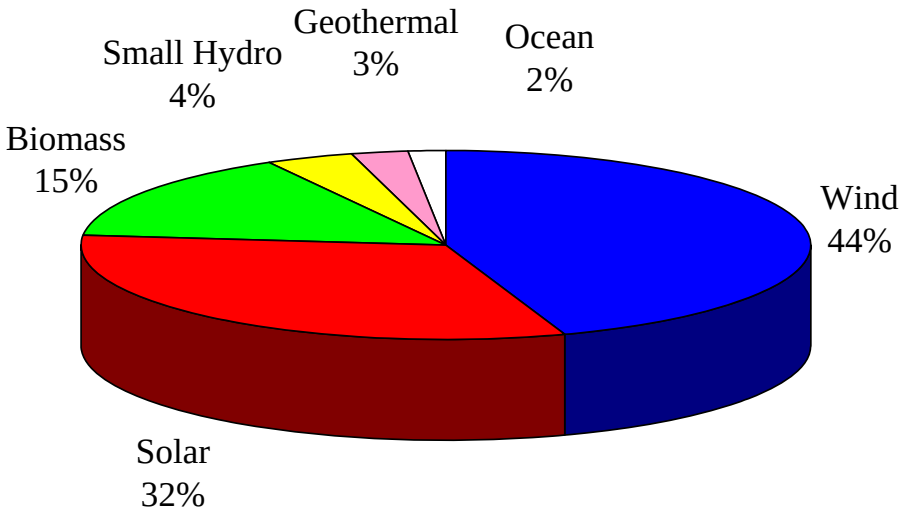
Global RE Market



- Western Europe likely to be the most significant market with USA subject to post-Bonn uncertainty

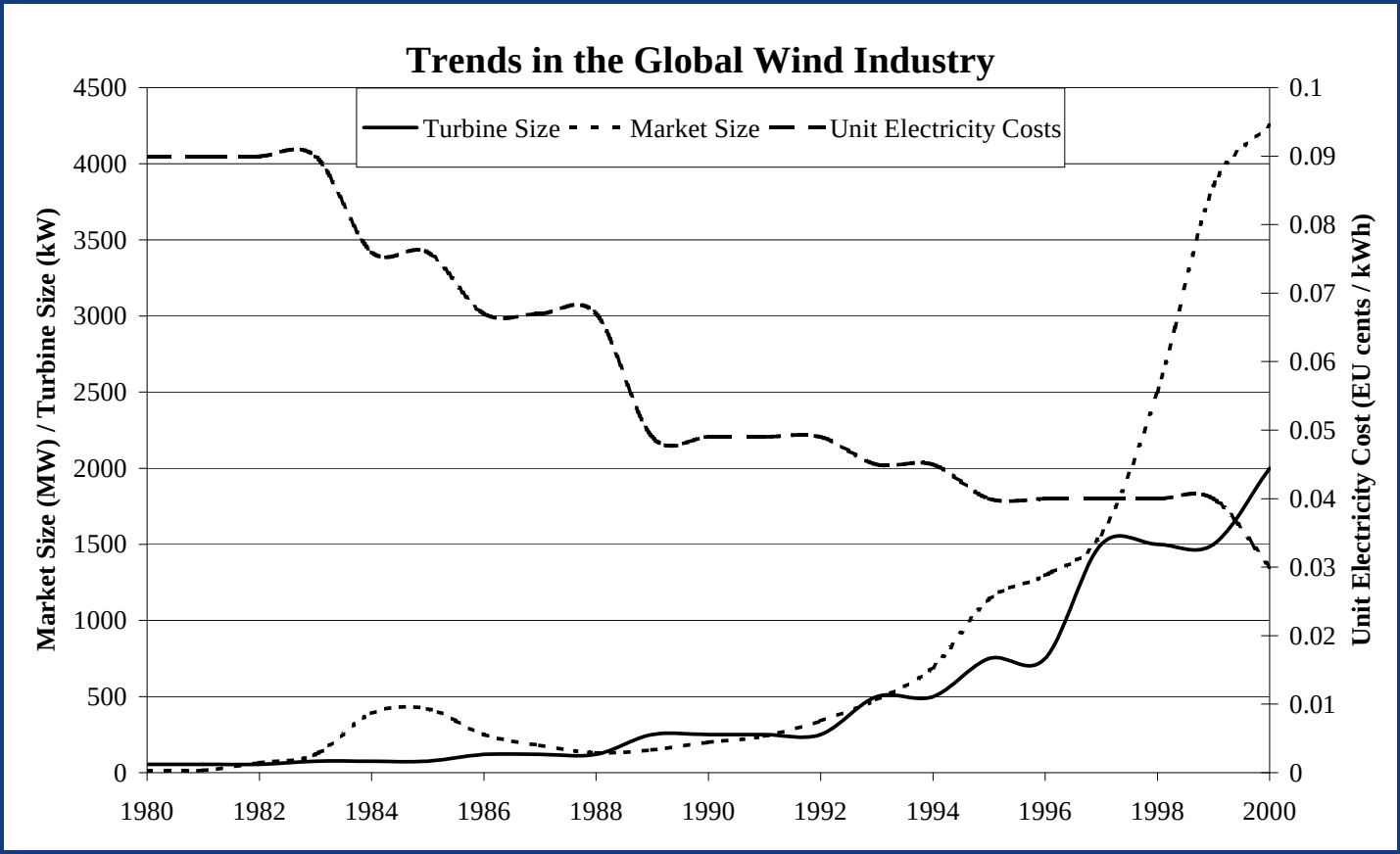
Global RE Market per Technology

Share of Capital Investment by Renewable Technology 2000-2010
Estimated Total Investment of $335billions
Source: EY Sept01

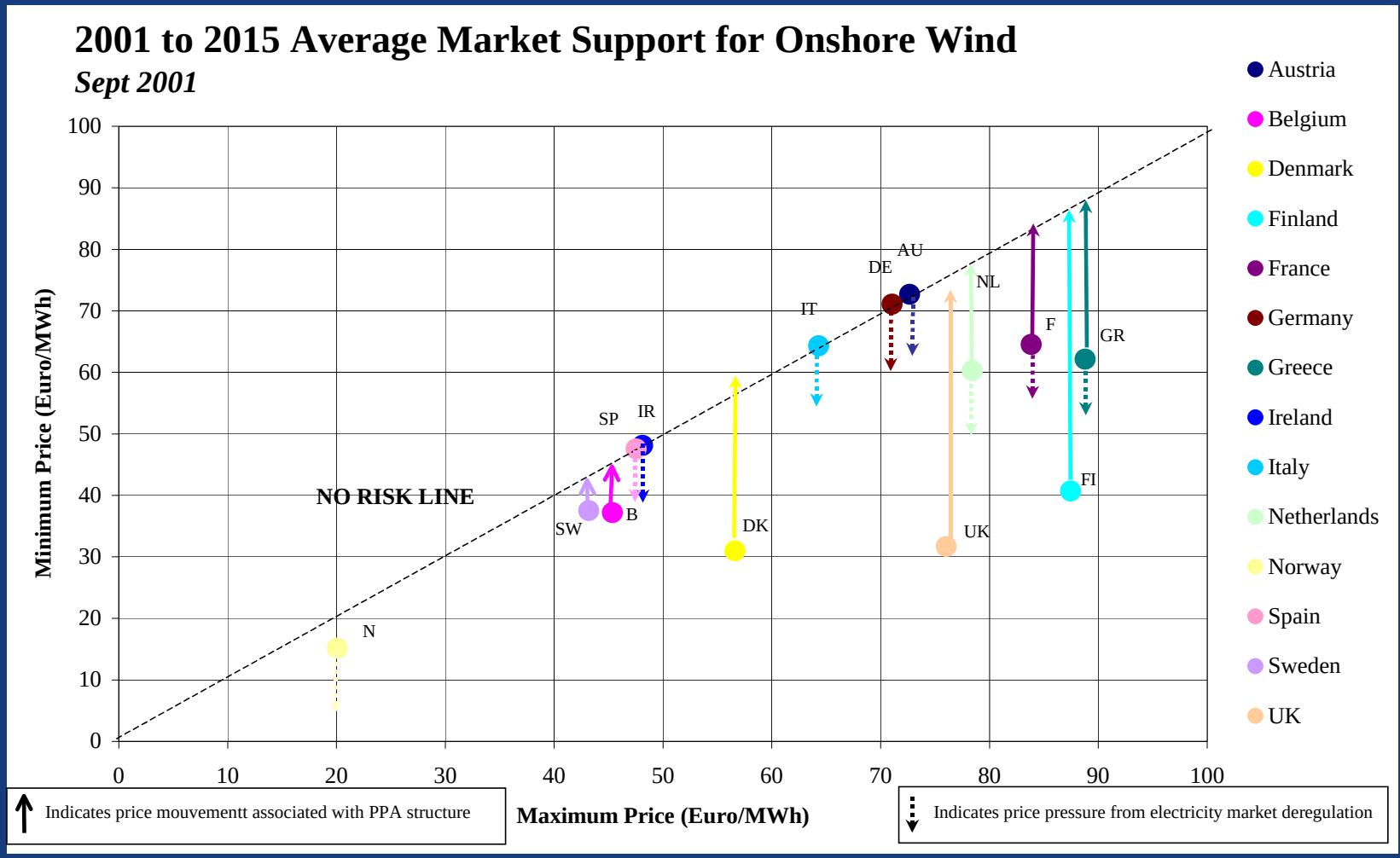


- Wind dominant technology as generation costs drop; a manufacturer and developer's play
- Solar driven by remote applications & BiPV; a manufacturer's play

Trends in the Global Wind Industry



Tariffs for Onshore Wind



Onshore Wind Power Factor compared to Germany
76%
100%
100%
100%
116%
100%
100%
116%
92%
116%
125%
100%
116%
116%

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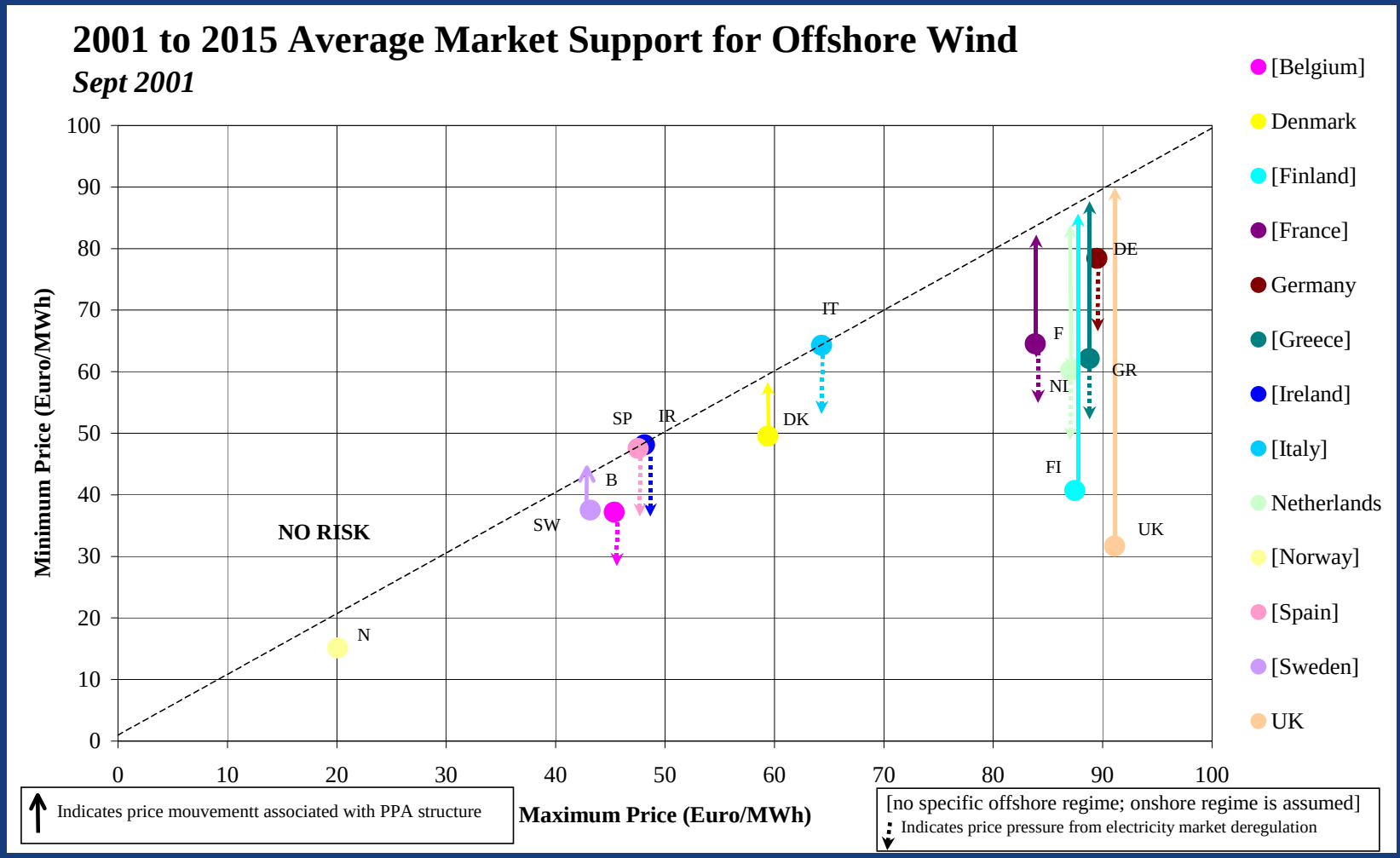
Tariffs for Offshore Wind



Offshore Wind Power Factor compared to Germany
100%
100%
88%
100%
100%
100%
110%
71%
100%
112%
88%
100%
110%

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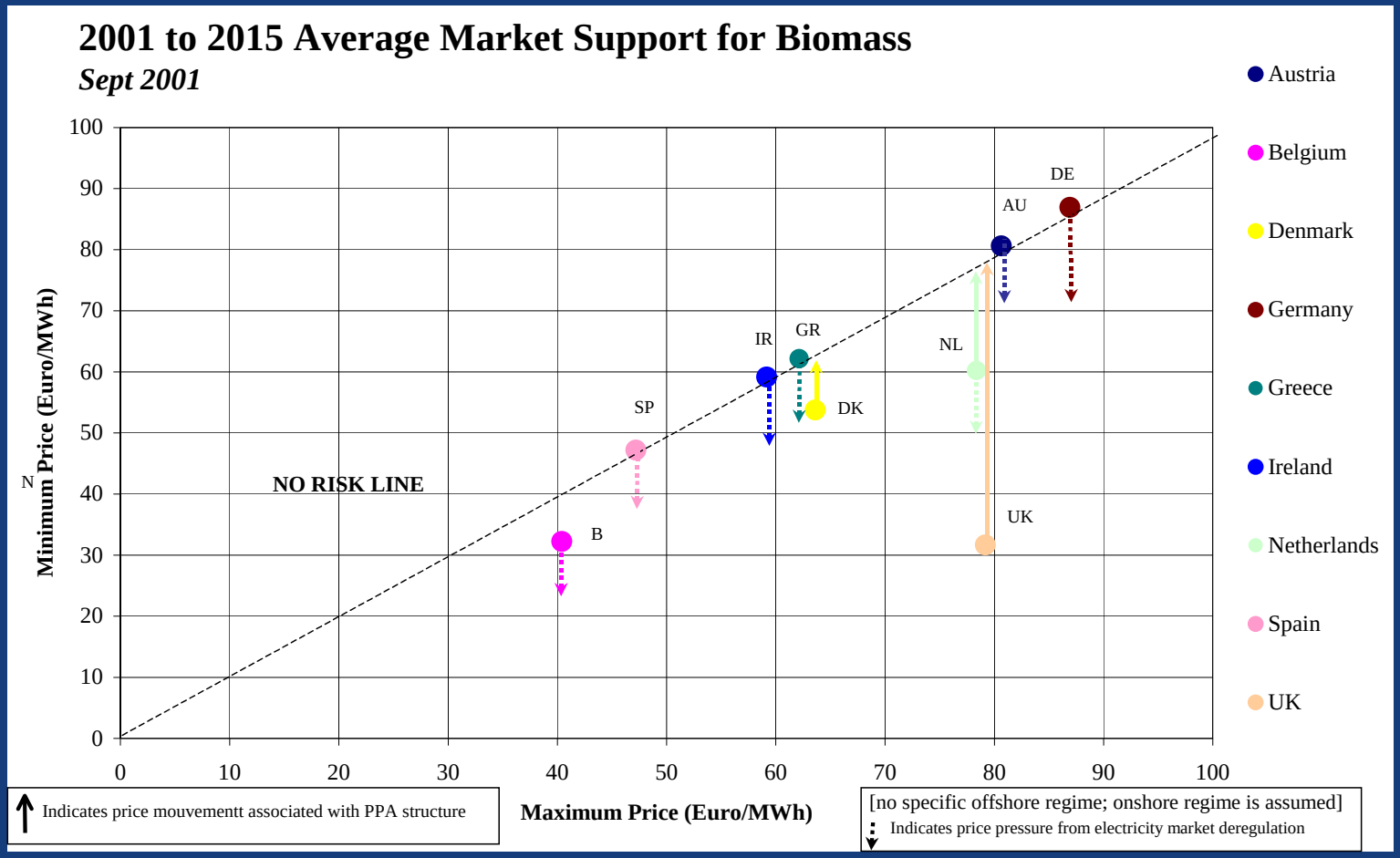
Tariffs for Biomass



- **Austria** (Oberosterreich Lander), **Germany**, **UK** and **Netherlands** likely to be attractive; new technologies however need more proving

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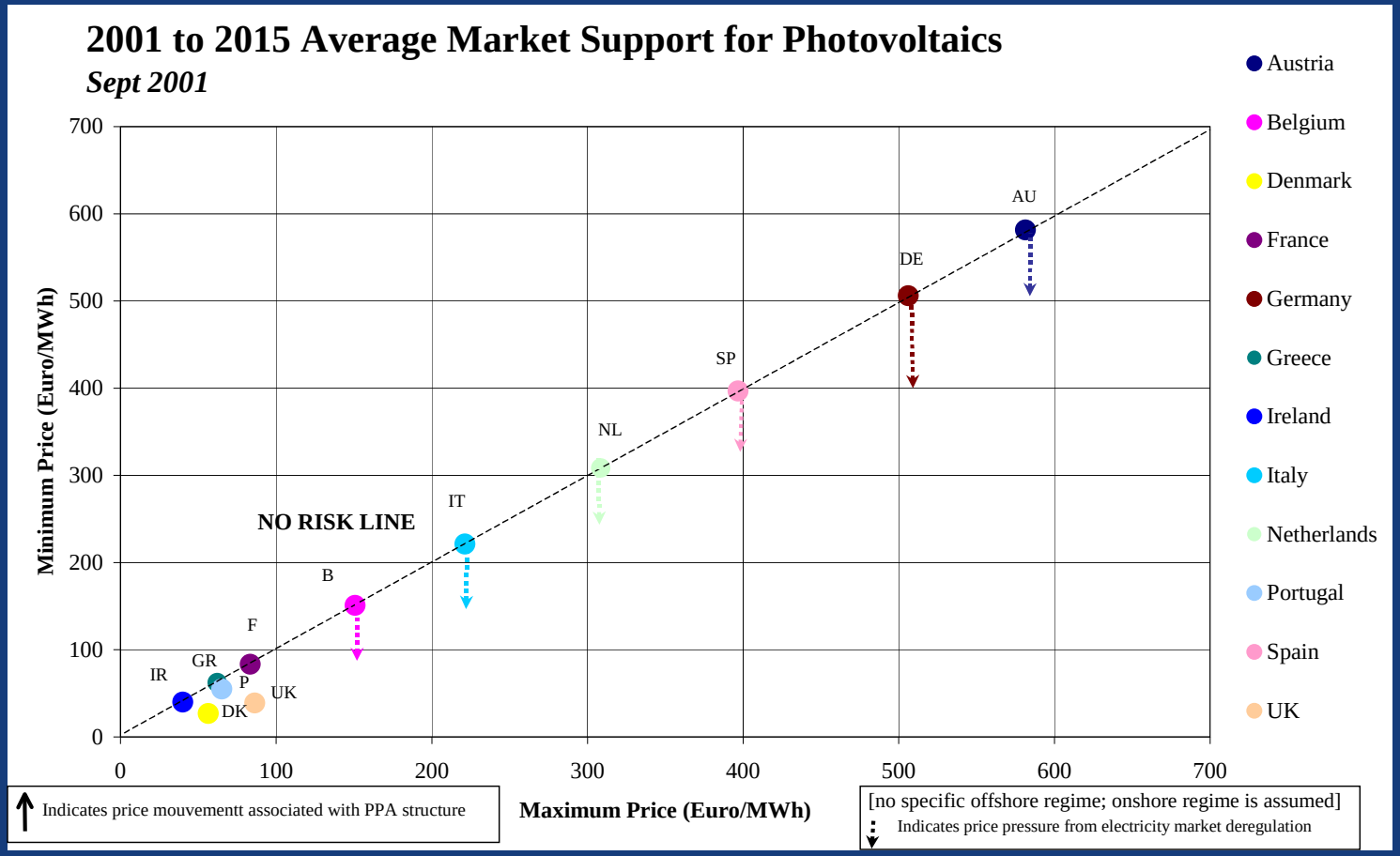
Tariffs for Photovoltaics



Solar Resource compared to DE

Austria	120%
Belgium	100%
Denmark	100%
France	135%
Germany	100%
Greece	150%
Ireland	90%
Italy	130%
Netherlands	100%
Portugal	170%
Spain	180%
UK	110%

- **Austria** Oberosterreich Lander leader
- **Germany** specially of interest with **Spain** & **Netherlands** following

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UK Renewable Energy

DRIVERS

- Renewables Obligation Certificate (ROC) – State Aid Clearance currently being sought from the EU
- Climate Change Levy (CCL)
- WDAs - 100% on certain turbines
- NFFO Transfer
- Other Government Support

INHIBITOR

- NETA

UK Government Incentives for Renewables by Technology

Source	10% Target	Renewables Obligation	CCL Exemption	Capital Grants	New Opportunities Fund
Landfill Gas	✓	✓	✓		
Sewage Gas	✓	✓	✓		
Energy from Mixed Waste (incineration)	✓		✓		
Energy From Waste (non fossil fuel)	✓	✓	✓		
New Hydro >20MW	✓	✓			
Hydro < 20MW	✓	✓	✓		
Existing Hydro > 20MW	✓				
Onshore Wind	✓	✓	✓		
Offshore Wind	✓	✓	✓	✓	✓
Co firing of biomass	✓	✓	✓		✓
Agricultural and forestry residues	✓	✓	✓		
Energy Crops	✓	✓	✓	✓	✓
Wave Power	✓	✓	✓		
Tidal & tidal stream power	✓	✓	✓		
Photovoltaics	✓	✓	✓	✓	

UK Renewables Obligation

- Banking of 25% of obligation per year
- ROC's value currently 2.8 p/kWh. Might actually be > 3p/kWh of some values buy-out recycling to compliant suppliers
- Country is short of ROCs (Government recent change of 5% to 3% of RES by 2003) – Large step up however required thereafter to achieve 10.4% by 2010 to 2027
- Demand of ROCs set by Government annually – Guaranteed for 27 years

But will there be a similar price for all technologies?

	P/Kwh		
	Theoretical	Financial Leakage	Net
Wholesale Price	2.0	-	2.0
Embedded Generation	0.3	0.1	0.2
Renewable Obligation Certificate	3.0	1.0	2.0
Levy Exemption Certificate	0.43	0.13	0.3
	5.73	1.23	4.5

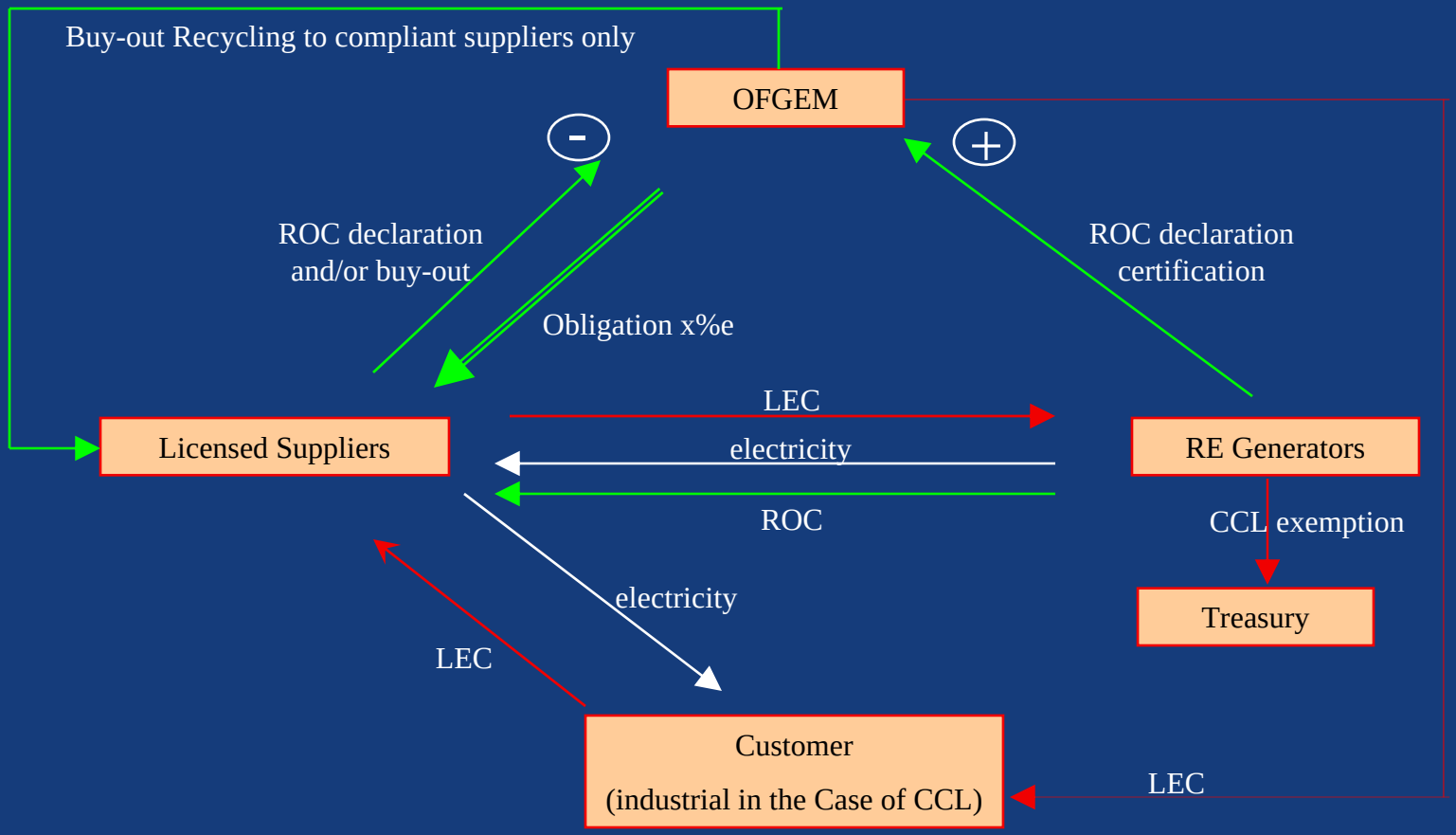
Technology load factor is the key influence on whole sale prices

But will there be a similar price for all technologies?

The ability to achieve satisfactory prices will depend on:

- Ability to predict power provided at gate close
- Intermittence of supply
- Ability to aggregate
- Trading ability
- Contacts in place – degree of risk transfer/term
- And possibly virtual supply
- Large supplies and traders are well placed to benefit. Particularly if they benefit from recycled ROC's

UK ROCs & LECs System



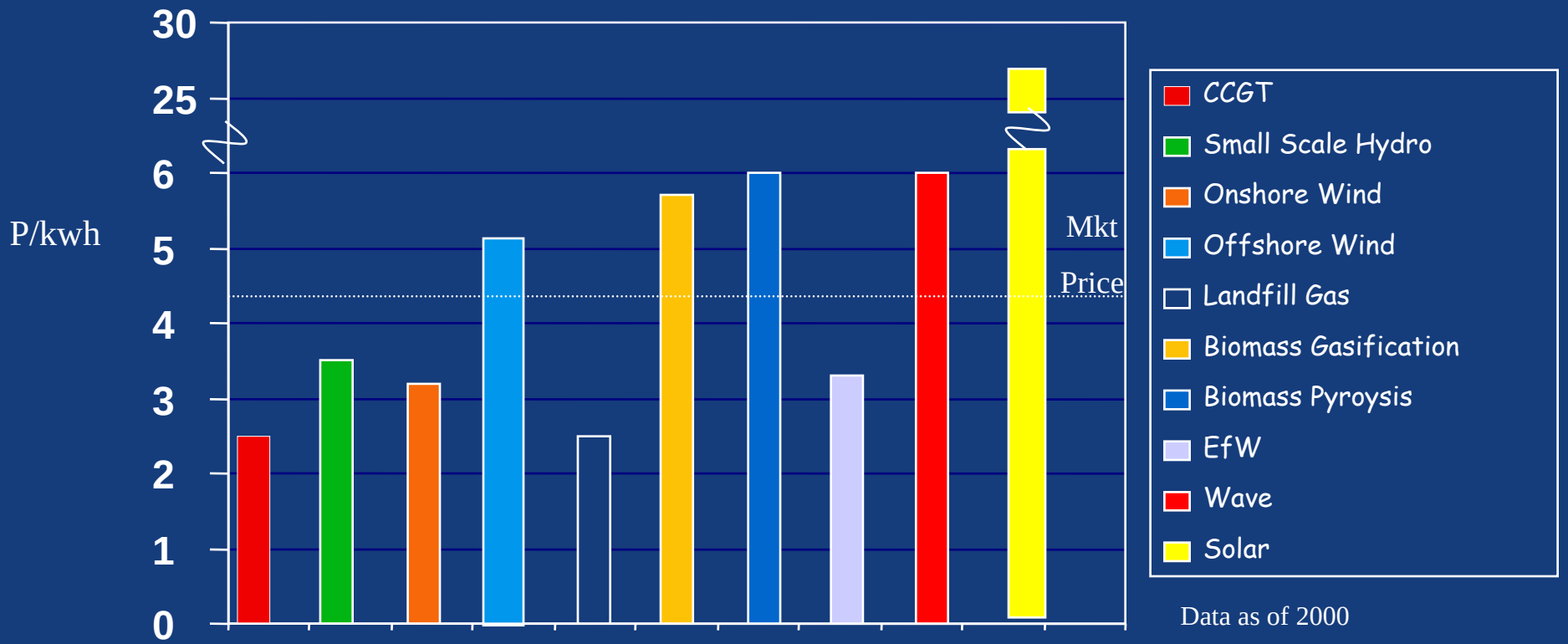
Levy Exemption Certificates LECs

- 0.43 p/kWh charge on electricity supplied to non domestic customers in the UK
- Renewable source provided that it is not electricity generated from a large hydro generating station I.e declared net capacity of more than 10 MW quality for CCL exemption
- One LEC is issued for each qualifying MWh produced
- LECs have to be traded with the electricitty and cannot be sold separately
- Coal Bed Methane may qualify for CCL exemption in the future

Carbon Emissions Trading Scheme

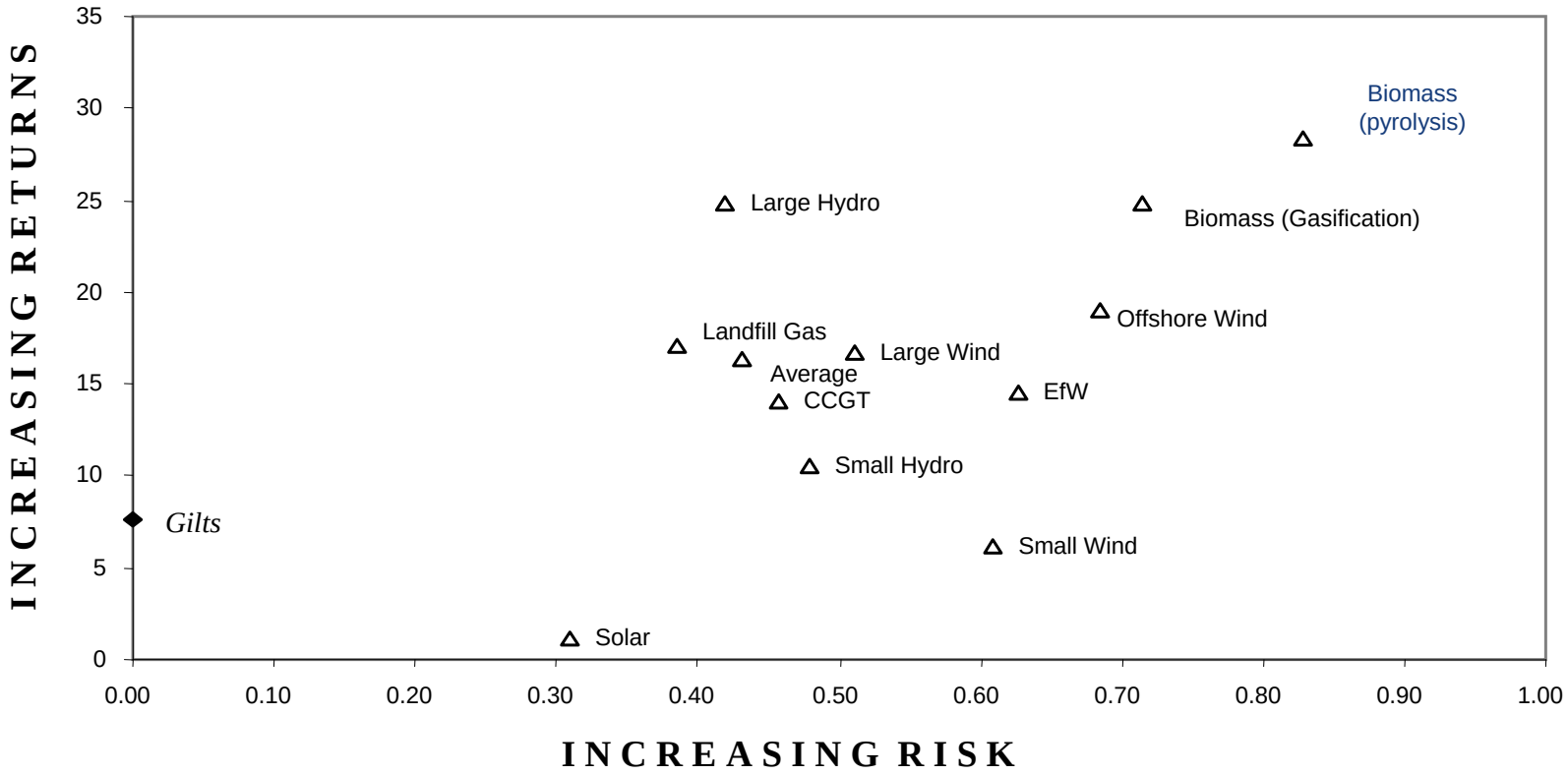
- Primary Relevance, Energy Saving EfW & Non ROC renewables
- UK launched first national CO2 trading scheme in August 2001.
- Cap & Trade – Voluntary inclusive emission caps accepted in exchange for share of government incentive monies. £215mill available over 5 years. Maximum per company £15million. Descending clock auction to allocate monies in Jan 2002. Emission reductions beyond cap can be traded.
    - Project Scheme – Voluntary emission cap for selective energy saving projects. No incentive monies available although emission reductions can be traded
    - Climate Change Agreement (CCA) – over 10,000 UK companies accepting unit based energy efficiency targets in exchange for 80% reduction in Climate Change Levy. Targets can be traded.
- EU scheme planned for 2004. Mandatory emission caps expected for certain sectors – IPPC? International trading from 2008.
- Internal trading currently exists eg BP

Offshore Wind: the challenge of revenues v's costs



Data as of 2000

Offshore wind: the challenge for shareholders



Some Solutions: Between the ROC and the hard place

- Initial market for ROC's influenced by NFPA auction process (presumably policy will not be to create a glut)
- Availability of NFFO1, NFFO2 capacity (with low borrowings)
- Energy traders without an established book. No transparancy?
- Consequence market is likely to focus on the first 5 year periods, with some capacity offered on a year by year basis
- Debt requirements are 10 to 15 year support
- If sponsors take a risk then longer term debt periods will be available. Justification, Synergy, Natural Hedges, Recycling

Some Solutions: ROC'S: Using intra project financial instruments to trade risk between consortia members

- Transfer existing NFFO's to offshore project to cover a critical 10 year period and to provide project with a blended merchant risk, fixed price character. Consortium receives warrant (option pricing) using instrument to compensate NFFO originator
- If NFFO's already used onshore, consider creating an onshore/offshore bundle > £100m for refinancing or securitisation. Negotiate sharing of fixed price/ROC benefits between participants.
- Use highly credit rated energy trader/supplier sponsor to provide floor to ROC retendering at 5 yearly intervals. Reward by way of support fee, equity ratchet and or increased share of ROC upside
- Retain free cashflows (possibly from liberated capital allowance) to provide ROC top up (ie waterfall of debt/service) – (query trapped money syndrome)

Other ways of bridging the value gap

- Defeasance lease: In the case of Project Eden (£65m financing from MC, ERDF and NatWest) was combined with a £46m RBS leasing facility to provide a multi million equity cashback. Cashflows were totally merchant being based on visitor numbers. 14 counter parties

- Double Dip: Cross border leasing commonly used for large infrastructure projects to increase project returns and reduce financing costs.

- KG equity structures they do work through a UK branch (and in some circumstances can be combined with double dip leasing)

- EY currently working on a UK equivalent: designed to assist replanting of onshore turbines it could also assist offshore if sufficient retail momentum built up. (EY already working on Irish projects using tax based leasing for on and offshore)

- Subject to crown agent policy cheaper finance could be attracted in (and possibly more European grants accessed) If a SEAGRID© concept were followed focusing on infrastructure provision to multiple developers: either single site or on a virtual basis

The Result

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UK Government Support Schemes

- DTI Capital Grants:
  - New Opportunities Fund (Lottery) £50m for Renewables
    - Energy Crops £33m
    - Offshore Wind £10m
    - Small scale biomass £3m
  - DTI Offshore Wind Scheme £39m
- Prime Minister, March 2001: Announcement of £100m for Renewables. PIU announcement shortly.
- R&D Support: £55m over the next 3 years for Biofuels, Fuel Cells, Solar, Wind, Water, Tidal Stream and Embedded Generation.

Grant Funding (Dave Armstrong)

Potential Sources for Capital Grants, Revenue Grants and Feasibility Studies

- **SMART** – towards innovation of products or processes. Capital or revenue funding
- **RSA** – Must have capital expenditure and job creation
- **EGS** – Maximum capital expenditure of £500k. No job creation to be eligible
- **Objective One** – Capital or revenue funding. Must have benefits to Cornish economy. Level of grant depends on whether private or public sector
- **SWIG** – Range of grants and soft loans where traditional finance cannot be obtained. Priority given to renewable energy and environmental technology projects

Difficult to give exact details on level of funding available as depends on type of applicant; the project and the scheme being applied to. SWIG can provide £3,000; Objective One could be up to 50% funding

May also be possible to get funding from more than one source

Key application criteria

- **Additionality** – Demonstrate need for grant ie project will only proceed with grant
- **Demonstrate outputs** – not necessarily job creation – Eg businesses assisted, industrial units developed, brown field converted
- **Drawing in of other funding** – Must be viable and project have access to other funding

Recently completed transactions

Wavegen: We successfully raised and structured equity finance for our client who has developed the first commercially viable wave powered generation system in the UK. This round of funding was led by Merrill Lynch New Energy Technology Plc.

Coventry & Solihull Waste Disposal Company: We advised the client on the procurement of a PPA contract for a 13MW municipal energy from waste plant through a competitive tendering process.

The CREED Project: We acted as financial advisors to this charity to assist in the financing of the Gaia Energy Centre, which is intended to act as a global focus for the education and demonstration of renewable energy. Our involvement included preparation of grant applications, a business plan and a financial model to assist in the finance raising process. We were also involved in the negotiation of loan documentation with funders.

Recently Completed transactions

The EDEN Project: We assisted in raising a European funding grant and also secured a loan from National Westminster Bank for this leading Millennium Commission funded project. We also structured and implemented an innovative leasing facility with the Royal Bank of Scotland.

Unit (e) Europe: We negotiated an umbrella facility to finance the renewable energy portfolio of Unit (e) Europe AG. The facility was also used to re finance seven hydro electric plants in France.

Energy Venture Fund: We provided the client with due diligence advice for their investment in a windfarm development company.

Holsworthy Biogas: We developed a complex financial model to support the raising of senior debt for this anaerobic digestion power plant. We acted as financial advisors to the project team and assisted with the raising of finance for the project.

Ernst & Young's Renewable Energy Group

Jonathan Johns

Andrew Perkins

Ben Warren

Richard Wheatley

15 Professionals in total

Tax	Financial modelling	Power Sector CF	Electricity Trading
Brian Garner	Jon Blackie	Chris Waltenspuel	Rodger Evans

Appraisal and Due Diligence → Financial Models and Valuation → Risk analysis and Mitigation → Procurement advice → PPA negotiation → Project Financing → Due Diligence And M&A → Refinancing And Exit

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