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Policy Options for incentivising low carbon power generation in different jurisdictions

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Audit.Tax.Consulting.Corporate Finance.

There is a wide range of mechanisms available to support low carbon power generation

Type of mechanism	Examples
Mandated requirements for new plant to be low carbon	• EU suggestion that all new plant be low carbon from 2020 (EU ETS would cover emissions from existing as well as new plant) • Portfolio standards in USA
Carbon pricing	• Tradable allowances • Taxes • Hybrids of taxes and tradable allowances • Potentially supported by other financial instruments
Industrial policy support	• Capital Grants • Tax breaks • Government or public utility equity
Support for new technologies, especially renewables	• Reserved market (may be implemented with tradable certificates) • Premium price set by regulator (e.g. feed-in tariffs) • Premium price set by auction, tender or negotiation

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There are good reasons for using emissions trading to incentivise abatement, but it has significant limitations

- For threshold phenomena allowances have advantages over taxes
- Climate change is likely to have thresholds associated with the global stock of pollutants implying advantages in principle for emissions trading
- Obtaining international agreement on quantity limits is less difficult than obtaining agreement on taxes
  - e.g. OPEC quotas, the Kyoto Protocol, EU burden sharing agreements and EU ETS NAPs
  - common international taxes (such as the EU's attempts to introduce a carbon and energy tax) have proved difficult to achieve
- An international regime to incentivise emissions reduction based on tradable allowances therefore has significant advantages especially with:
  - wide geographical and sectoral coverage
  - tight, long-term, credible caps
- The EU ETS represents an important step towards such an international regime with prospects for USA and Australia appearing promising
- But present arrangements may not create sufficient long-term certainty to stimulate the necessary investment, with the risk of weakening future caps

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Taxes also have advantages but raise political difficulties

Taxes have advantages…

- Provide stable pricing signal into long term as governments need revenue
- Avoid risk of very high or very low carbon prices and consequent economic disruption

But tend to be politically unpopular…

- Inelasticity of energy demand can imply large income transfers
- Competitiveness concerns due to difficulties of international harmonisation
    - Auctioning of emissions allowances may raise similar objections

…. And do not guarantee meeting quantity targets

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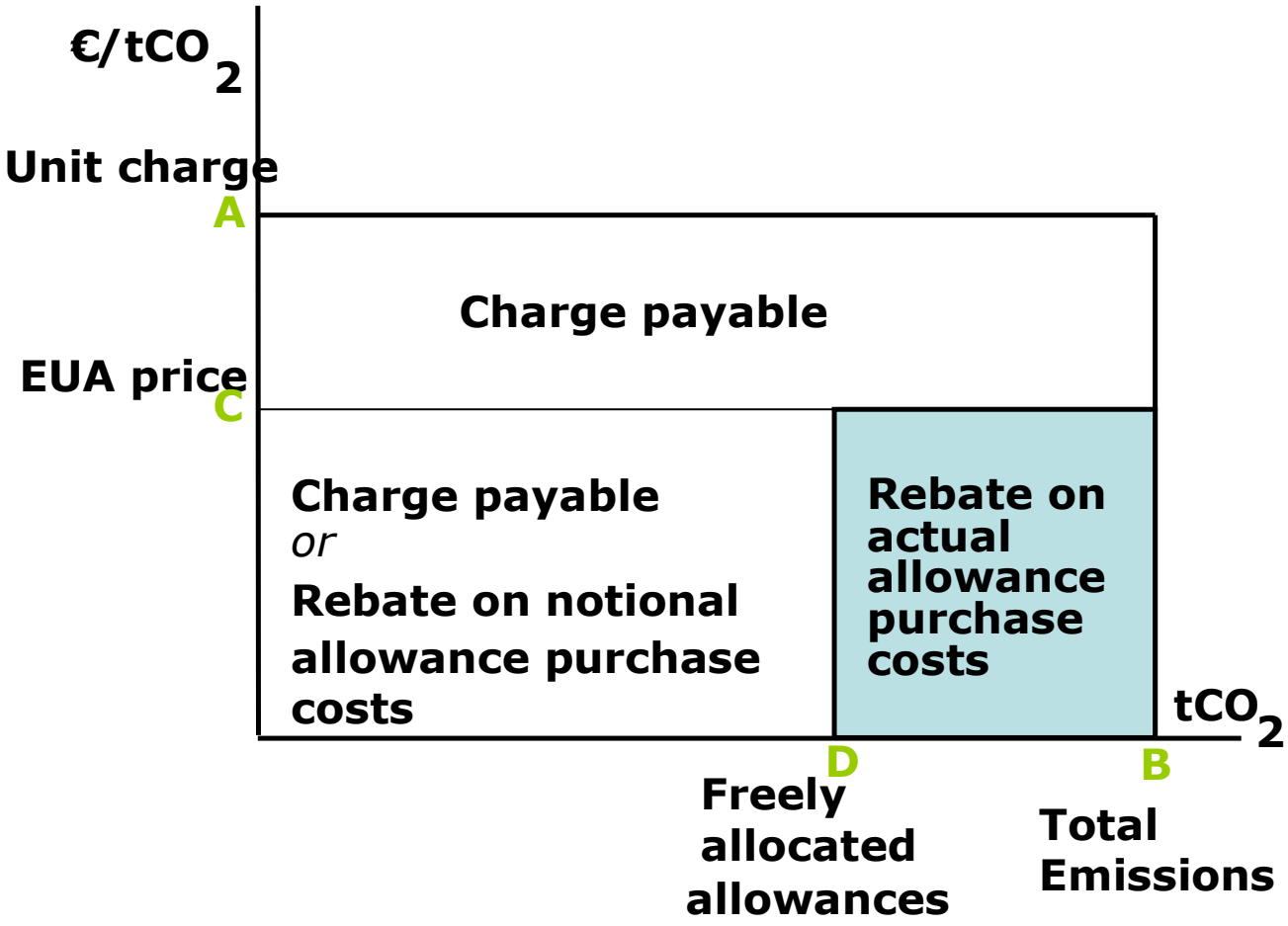
Fiscal measures could place a floor on the price under a cap and trade scheme, providing more stable price signals to investors

Illustration of floor with EU ETS (EUA price below floor)



Initial Bill = charge x total emissions **A x B**

Allowance purchase cost = EUA price x emissions purchased **C x (B - D)**

Notional allowance purchase costs = EUA price x freely allocated allowances **C x D**

Note: If extended outside the power sector may also rebate local taxes such as CCL

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Objections to this type of scheme do not seem compelling in practice

Objections	Response
Stern: may lead to differences in international carbon prices in practice	Prices differ only if allowance prices are below the floor A harmonised global carbon price is a long way off - carbon prices will vary anyway (e.g. between schemes) Energy prices also vary for many other reasons
Stern: obstacle to linking to other schemes	Buy-back mechanism may make linkage more complex but tax and rebate mechanism does not
Climate Change Minister: This will be like ERM	May apply to buy-back mechanism but not to tax and rebate route

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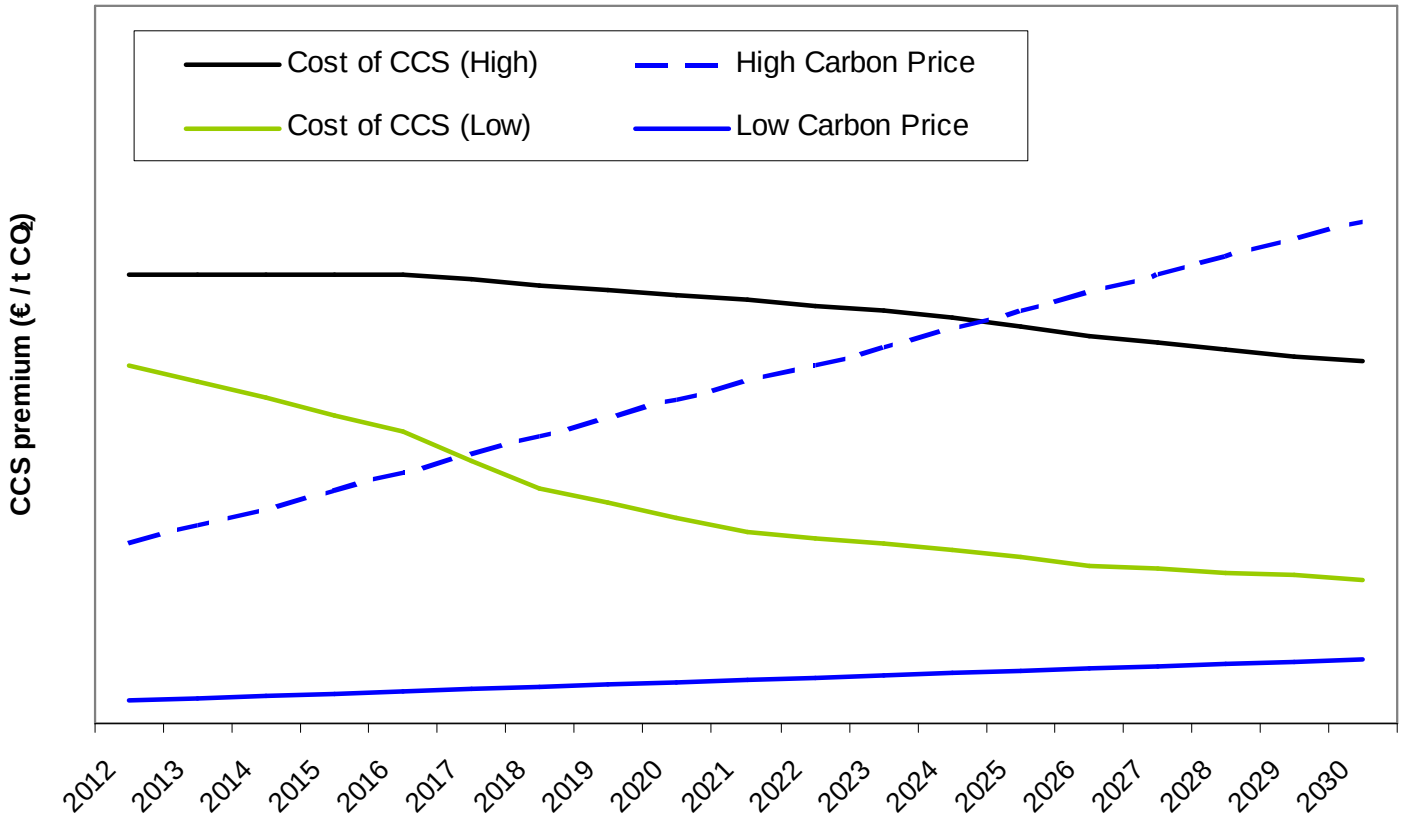
However CCS is likely to require incentives over and above the carbon price, perhaps for many years

- Premium depends on level and geographical coverage of carbon price
- Total costs of incentives could be several hundred billion dollars (worldwide over time)

Premium over carbon price required to support CCS



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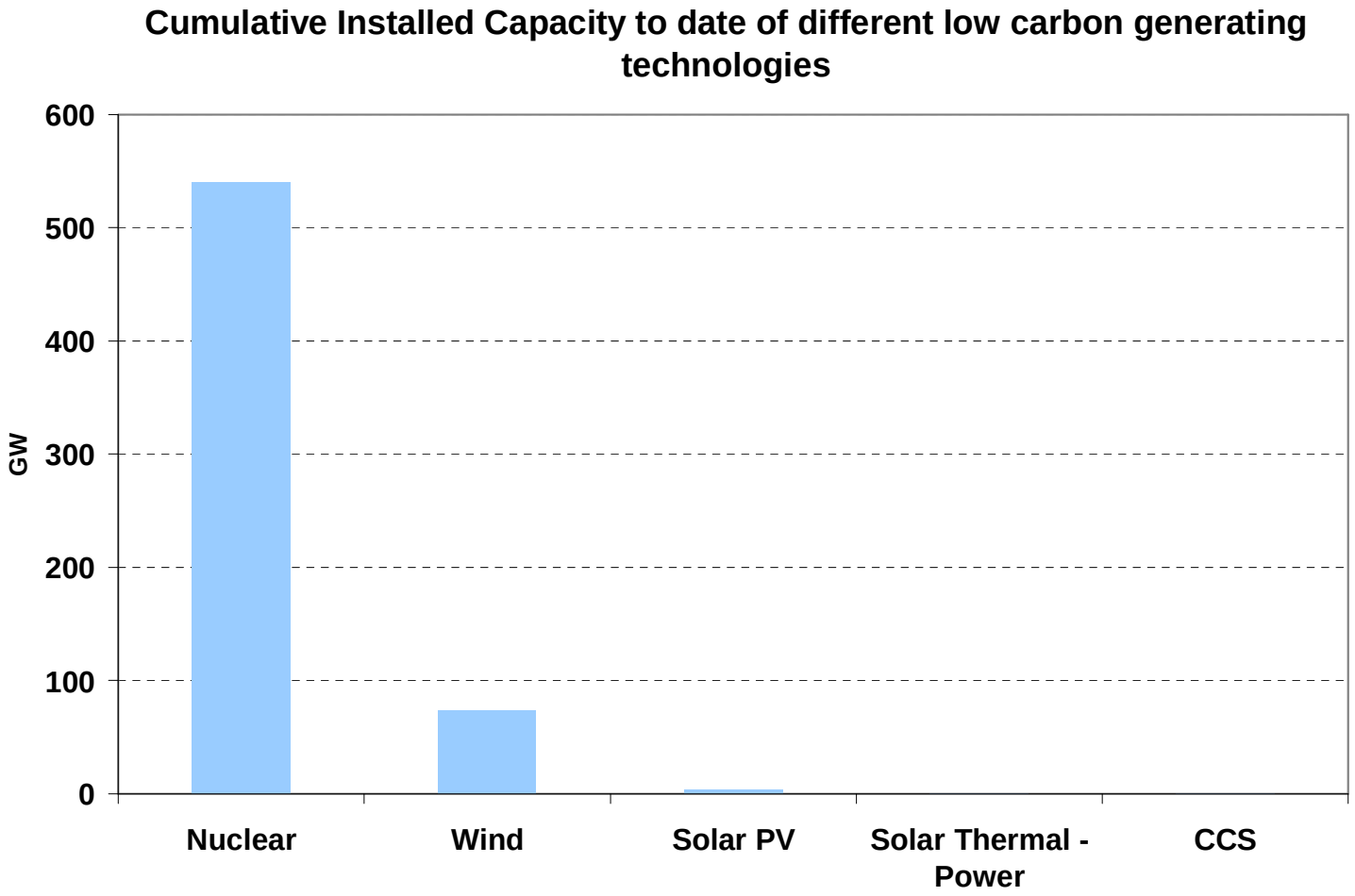
The requirement for additional support reflects the immaturity of the technology and will also apply to other new technologies



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There are various sources for funding the additional cost premium for CCS

Customers	• electricity prices are higher due to the carbon price • additional costs from quantity obligations (e.g. Renewable Portfolio Standards or Green Certificate Schemes) • separate tax or levy on the retail price or wires business charges • the cost of premium priced contracts (e.g. feed in tariffs) passed through
Tax payers	• general or earmarked taxation may fund support as grants, aids or tax breaks (capital or per MWh support) • government or publicly owned utilities may provide cheap capital (debt or equity)
Shareholders	• surplus created by free allocation of allowances can be appropriated by means of auctions, windfall taxes or price floor arrangements and channelled to clean generation • sums available are potentially substantial. Estimates of windfall gain in the UK power market alone are c. €1.1 billion p.a. • shareholders may choose to raise funds to invest to secure future gains

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There are a number of advantages to using earmarked taxes to complement revenue raising via the electricity price

Objective	Advantages of earmarking
Public acceptance of taxes	Taxpayers are more likely to support a new tax if there is a connection between the tax and a particular public service
Increased transparency and control, reducing distortions by interest groups	Earmarking can limit political distortions introduced by interest groups lobbying on non-earmarked taxation and this can increase acceptance of taxes.
Sustainability of funding and investment	Gives credibility to budgetary decisions and provides a stable revenue stream.
Efficient levels of expenditure on emissions abatement	Can lead to efficient expenditure where the cost of damage resulting from emissions is difficult to estimate and it is difficult to set robust emissions caps at the efficient level
Provision of information on voters' preferences	The process of establishing earmarking can increase information on voters' preferences, especially if conducted through a referendum
Environmental taxation and a double dividend	Spending tax revenue to secure environmental benefit may lead to larger welfare gains in some cases than reducing income taxes

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Capital grants, low cost capital and tax breaks have a role to play but may not be the whole solution

Capital grants

- Valuable to investors
  - Guaranteed funding
  - High present value due to upfront payment profile
- Incentives for output can be retained and allocation can be capacity related (e.g. per MW for certain type of technology)
- Simple to administer
- But can be more difficult in some political environment than others
  - E.g. may be related to regional aid, may be State Aid issues

Low cost capital

- Low cost capital via state loans or through publicly owned utility
  - Possible rationale is that it provides high risk capital at low risk rates, thus meeting the cost of technical risks
- State Aid issues in EU – must be awarded on a competitive basis

Tax breaks (e.g. enhanced capital allowances, reduced tax rate)

- Require new revenue to be foregone rather than funds from existing revenue
- Some capital intensive projects pay little tax in early years
- May include exemption from consumer taxes (e.g. CCL in UK)

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A low carbon obligation gives some certainty of achieving targets (subject to a buy-out) but raises challenges

- The "lumpy" nature of new capacity (relative to the likely scope of an obligation) is likely to cause difficulties both with setting targets and liquidity of trading
  - averaging compliance (e.g. over 5 years) offers partial mitigation
  - an obligation that includes existing generation may give market power to incumbents
- There is a risk that average market prices may be distorted
  - price may rise to the buy-out level in the "compartmentalised" part of the market, with a significant impact on overall market prices
  - obligation may risk raising the cost of entry and thus wider market prices
- Does not provide signals for other carbon reduction at the margin
- Parallel to EU ETS rather than directly complementary
- May be most appropriate as a standard applying to all new plant provided costs not excessive

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Feed-in tariffs (or benchmarked prices) have proved successful in stimulating investment but may be more difficult to make work for CCS, especially in liberalised markets

- Not reliant on carbon pricing
- Varies with technology and scale of plant
- Guaranteed revenue is attractive to investors
- EU review confirmed effectiveness for some technologies
  - e.g. onshore wind in Germany, Spain, Denmark
- RO banding in UK represents a move towards technology-specific character of feed-in tariffs
- But CCS plants would have exposure to movements in fossil fuel prices

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A guaranteed premium over the market price may be a good alternative to feed-in tariffs in liberalised markets

- A contract offering a premium over the wholesale market price offers many of the advantages of feed-in tariffs, easier to implement in liberalised markets
- Provides hedge against energy price movements through linkage to the wholesale price (fixed premium not a fixed price)
  - May be especially important for CCS
  - Some precedent from Danish fixed premium scheme
- Contracts could be awarded by auction or tender to reveal costs
- Similar in principle to:
  - the original UK NFFO contracts for renewables (but offering a premium rather than a single price)
  - old UK ETS (but support not necessarily awarded per tCO_2 abated)
- May over-reward if carbon prices go high
  - This can be mitigated if support is in the form of a CfD on carbon price
- Need not be technology neutral

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Conclusions

- There is wide consensus on the urgent need to reduce carbon emissions
- There is a range of policy instruments available that can be tailored to different national circumstances
- Trading schemes provide a powerful mechanism for incentivising reduction provided:
    - wide geographical and sectoral coverage
    - caps are tight, long term and credible
- A well-functioning inter-continental scheme still appears many years off
- Hybrid tax and trading schemes appear to have significant potential to reinforce the incentives from emissions trading at national level
- Other schemes will be necessary to complement carbon pricing for new technologies such as CCS
- The preferred support mechanisms will depend on policy objectives, technology stage, and market circumstances, with a role for each of
    - feed in tariffs,
    - contracts guaranteeing a price premium over the market
    - well-designed quantity obligations

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