

Investing in R&D to advance Renewables Technology

- Morgan Bazilian
- Frank Convery
- Lisa Ryan

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Discovery is an old tradition in Scandinavia....

- **Jorge Louis Borges:** *The things of Scandinavia tend to be secret, as if they were a dream...*
- *Eric the Red discovered Greenland around 985; his son Leif disembarked in Canada at the beginning of the eleventh century*
- Dublin was founded by the Vikings in 885

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**Overall, renewables not making a significant contribution
(% growth)**

	1970-80	1980-90	1990-2001
Renewables	3.2	2.4	1.2
Biomass	3.5	3.0	1.6
Hydro	2.6	0.7	9.4
Geothermal	8.3	9.4	0.4
Wind/Solar	6.4	23.5	23.1

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**The Knowledge Paradox –
truth comes dropping slow**

- **Jos Billings:** *Our trouble is not ignorance. It is that we know so many things that are not true.*

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Key Question:

- How to deploy R&D as a policy instrument to achieve innovation in the renewables sector?

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Outline

1. Justification for policy intervention via R&D – Market failure
2. The EU Context
3. R&D as Policy Instrument
4. R&D in a small open economy – Ireland
5. Issues and Questions to be addressed

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I. Justification for policy intervention via R&D – Market failure

- **John Muir:** *When we try to pick out anything by itself, we find it hitched to everything else in the universe.*
- Policy instruments
Rationale for R&D as policy instrument – creating unequal heads.
- **Cocteau:** *In France, equality consists of cutting off the unequal heads*

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II. The EU Context - European Research area (ERA) and competitiveness

- **Henry Ford:** *If you need a new machine and don't buy it, you pay for it without getting it.*
- Target setting (3% of GDP on R&D) and
- Renewables targets

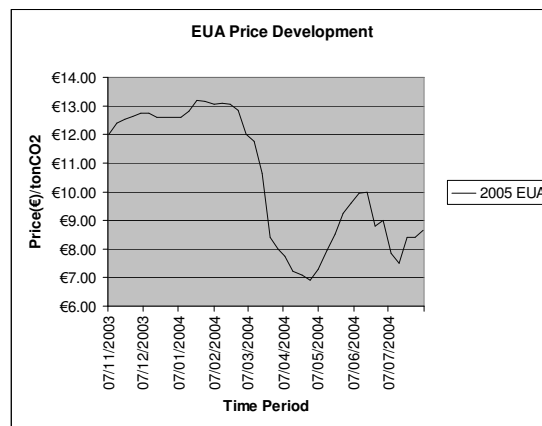
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Emissions trading – centrality of property rights

- **Niccolò Machiavelli:** *So long as the great majority of men are not deprived of either property or honour, they are satisfied.*

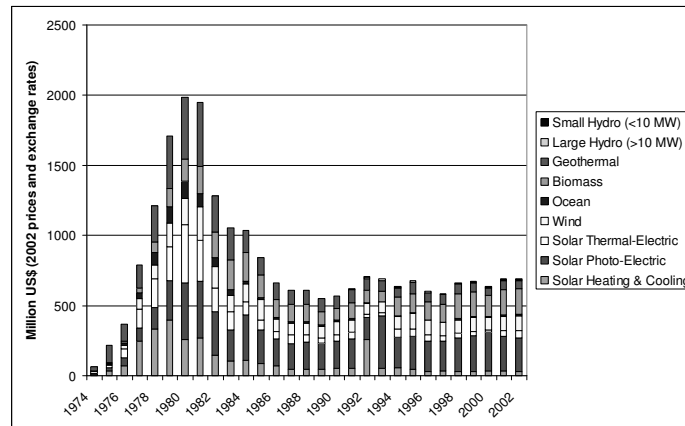
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Futures Prices for CO₂ per Tonne



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III. R&D as Policy Instrument



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de Tocqueville.

- *There is a propensity that induces democracies to obey impulse rather than prudence, and to abandon a mature design for the gratification of momentary passion.*

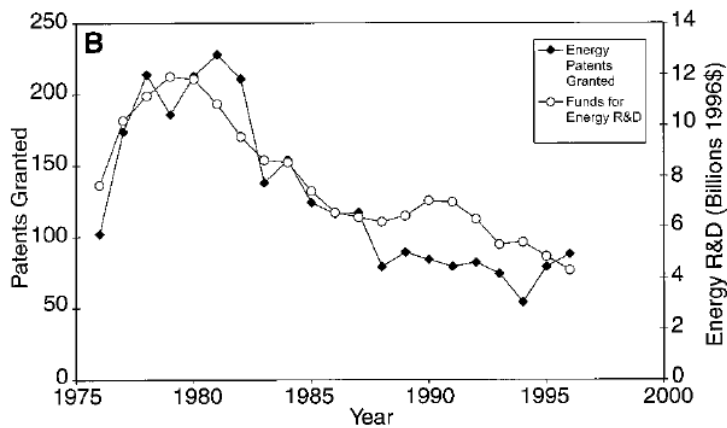
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Evaluating Performance

- **Criteria**
- - economic efficiency and encouraging innovation, feasibility and fairness
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- Optimal level of expenditure
- R&D as a factor of production
- **Louis Pasteur:** *Inspiration favours the well prepared mind.*

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Estimating Benefits



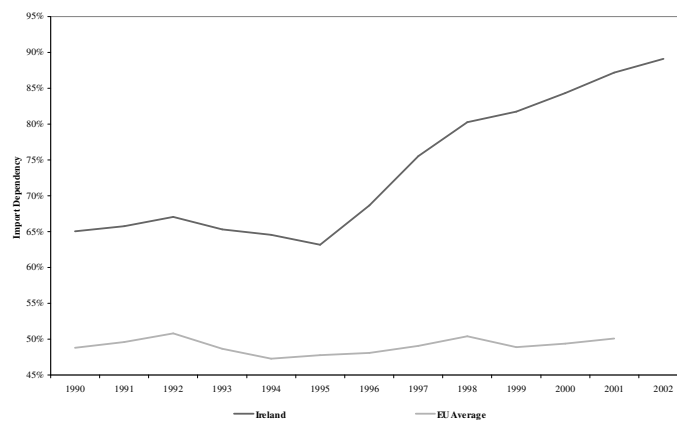
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III. R&D in a small open economy – Ireland

- The mercenary impulse and innovation
- **Thomas Alva Edison:** *Anything that won't sell, I don't want to invent.*
- Economic and innovation context
- Innovation and renewable energy

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The Import Dependency Context - Ireland



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The imperative of public support

- **Abraham Lincoln:** *With public sentiment, nothing can fail; without it, nothing can succeed.*

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V. Issues and Questions to be addressed

1. How level is the playing field for renewables versus fossil and nuclear sources?
2. Can the declining share of renewables in the energy mix be reversed?
3. Does de-regulation of energy markets help or hinder innovation, and associated expenditure on R&D?
4. What are the relative contributions of learning by doing, and research and development, in advancing the use of renewables?*

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More Issues

5. How significant are price signals in general, and (in Europe) the CO₂ allowance market, in stimulating innovation in renewables?*
6. How can we improve the evaluation of R&D in renewables?
7. What are the best examples of public-private partnerships in advancing renewables technologies?*
8. Should the R&D priority be fundamental research or application and commercialisation?*

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More Issues

9. Can R&D funding operate counter cyclically, i.e. intensify when economies are in recession and energy prices are low, and not the converse?
10. How important are removing policy barriers and uncertainties, relative to other considerations?
11. Should 'technology targeting' characterise R&D support, or should the focus be wider?*

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Parsimony of Effort

- **Caligula:** *A man ought either to be a good economist or an emperor.*
- **Zen, gardening and economic efficiency:** *The use of the most economical means to obtain the desired effect, the product of Zen philosophy, is another characteristic of the garden of the Ryōanji (Kyoto).*

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The Future

- **René Dubos:** *The future is never an extrapolation of the past. Animals probably have no chance to escape from the tyranny of biological evolution, but human beings are blessed with the freedom of social evolution. For us, trend is not destiny.*
- **Anonymous:** *An economic forecaster is like a cross-eyed javelin thrower; he doesn't win many accuracy contests, but he keeps the crowd's attention*

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