Support Mechanisms for Renewable Energy

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Support Mechanisms for Renewable Energy

Disclaimer:

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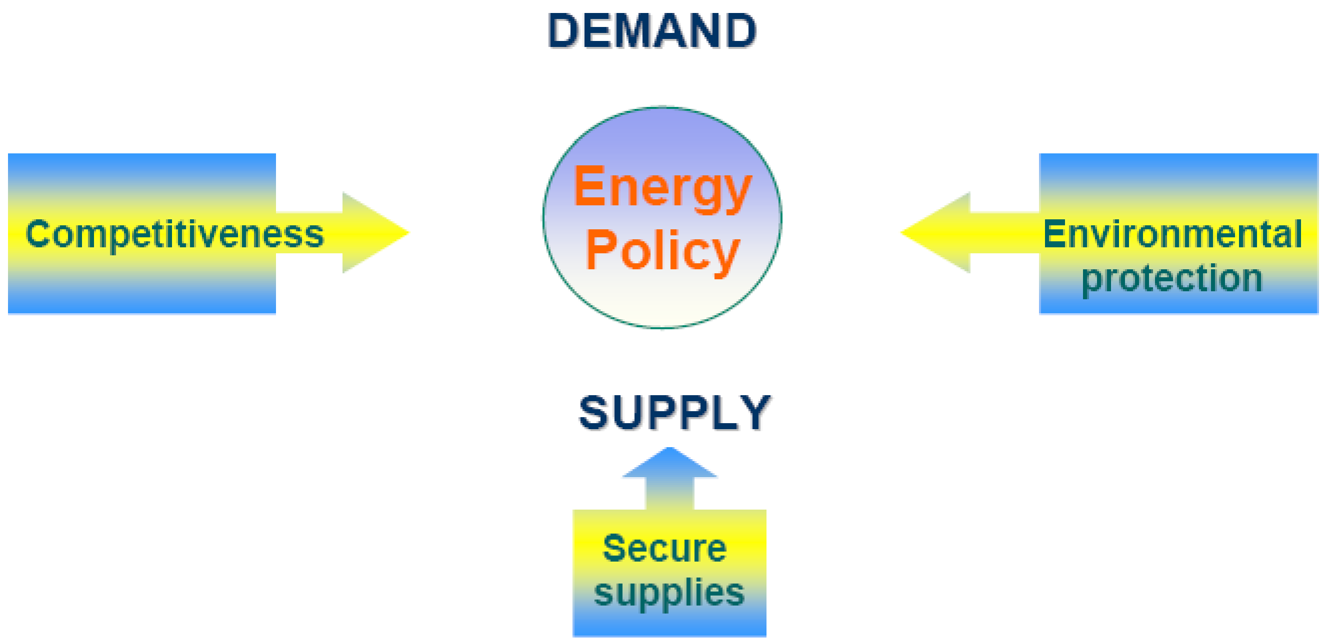
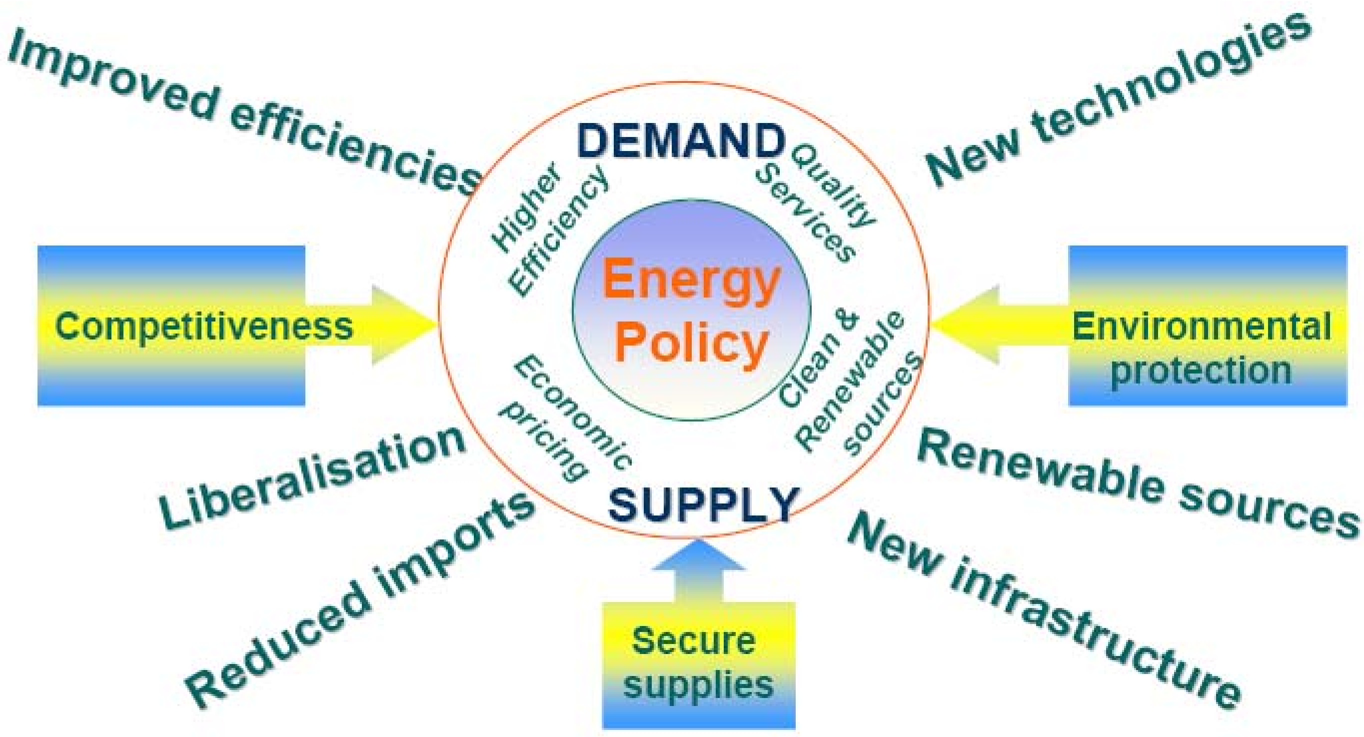
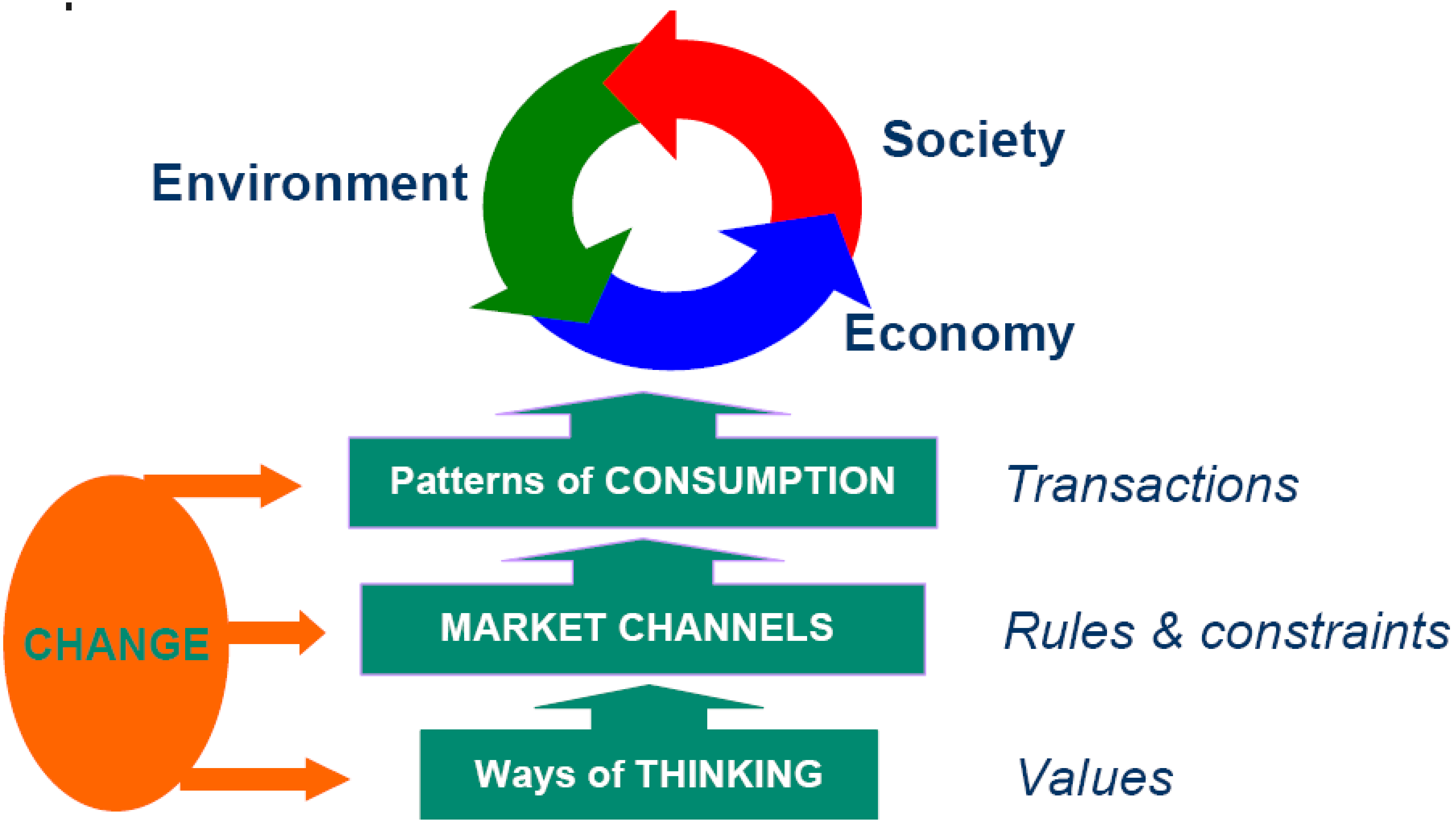
Structure of Presentation

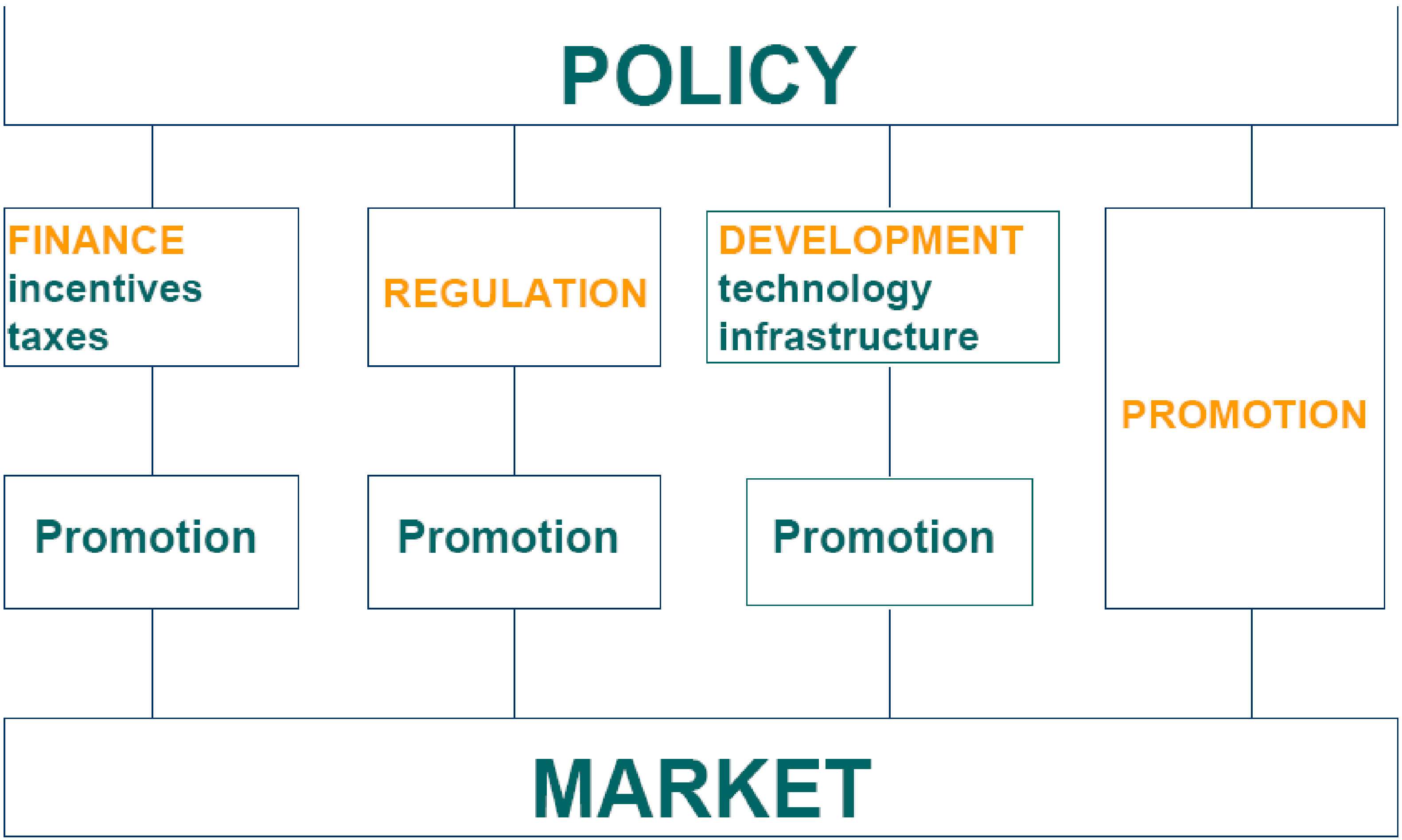
- Review of Types of Mechanism
- Review of Experience with Types
- Tentative Conclusions
- Issues for Ireland


DEMAND
Competitiveness
Energy Policy
Environmental protection
SUPPLY
Secure supplies


Improved efficiencies
New technologies
DEMAND
Higher Efficiency
Quality Services
Energy Policy
Competitiveness
Environmental protection
Economic pricing
Clean & Renewable sources
Liberalisation
Renewable sources
SUPPLY
Reduced imports
New infrastructure
Secure supplies


Society
Environment
Economy
Patterns of CONSUMPTION
MARKET CHANNELS
Ways of THINKING
CHANGE
Transactions
Rules & constraints
Values

Energy Policy Instruments



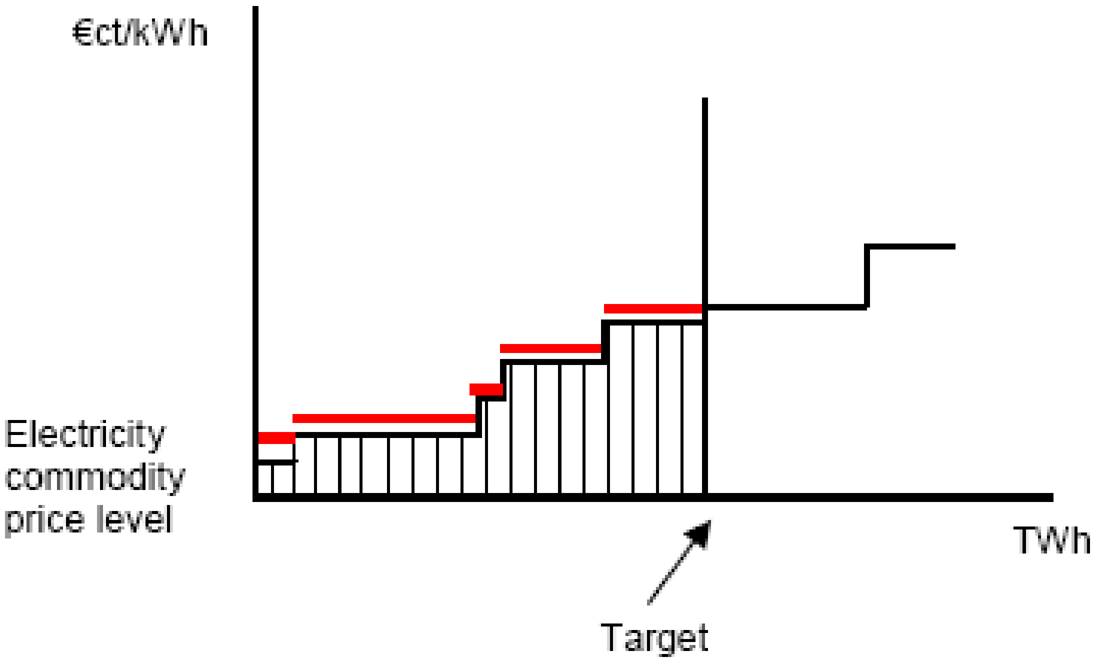
Types of Mechanism

- Quota Obligation Scheme
- Feed-in Tariff Scheme
- Tendering Scheme
- Capital Grants
- Tax Incentives
- Green Marketing

Instruments: Quantity or Price Based?

- Quantity: outcome certain; cost not
- Price: outcome uncertain; costs minimised
- Concensus in Ireland that price-based approach preferable

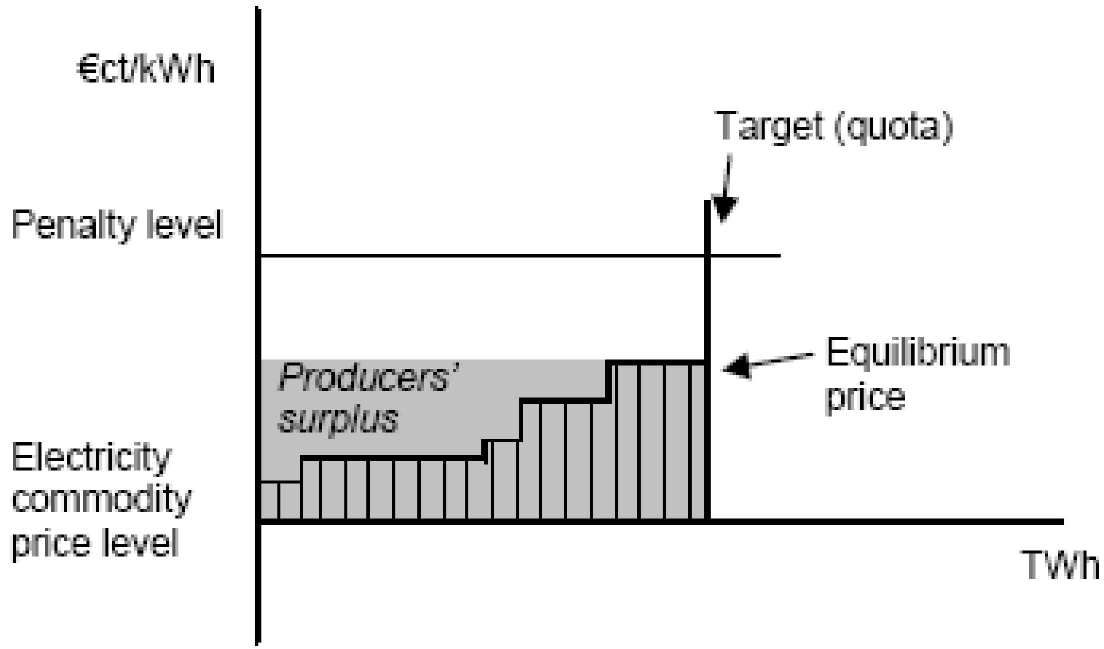
Renewable Electricity Supply Curve



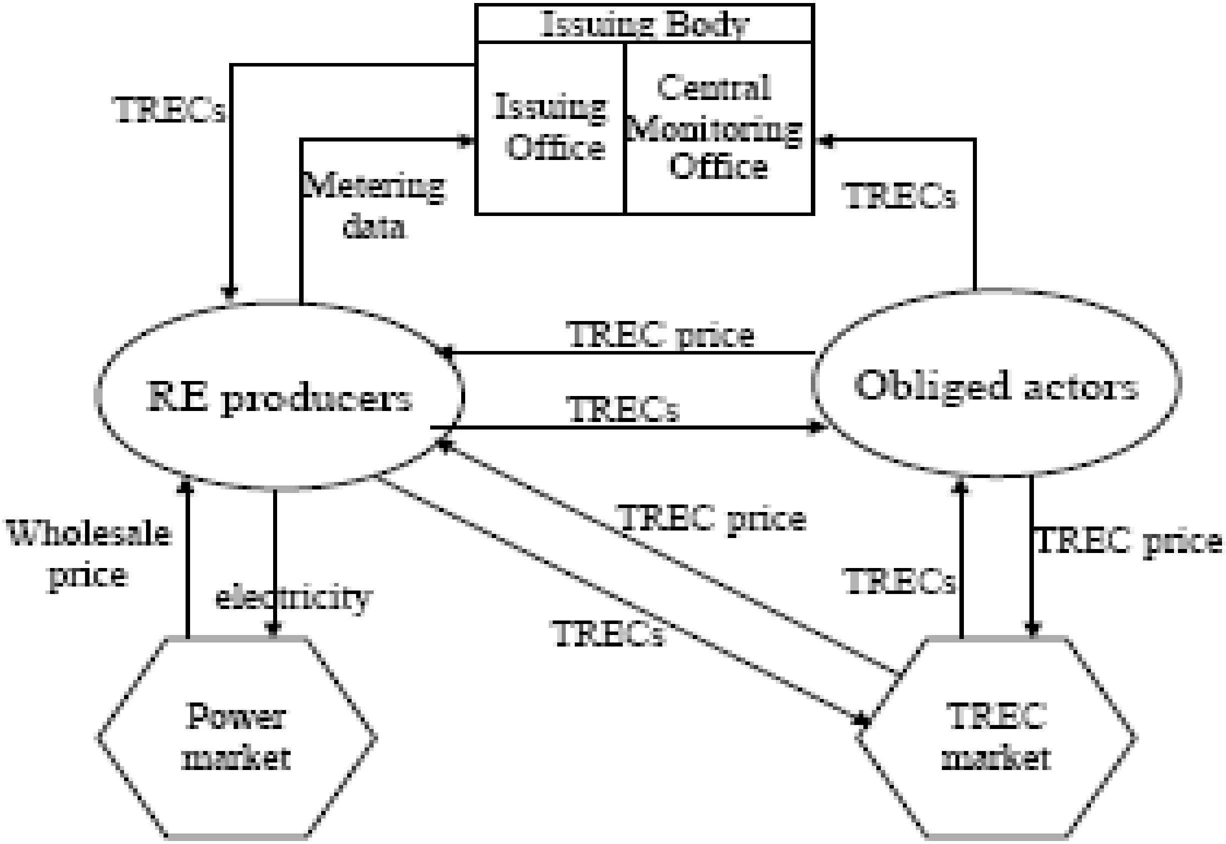
Quota Obligation Scheme

- Target amount or proportion of electricity must come from eligible RES
- Obligation usually on supply companies
- Traceability – Tradable Renewable Energy Certificates (TRECs)

Supply Curve – Obligation System



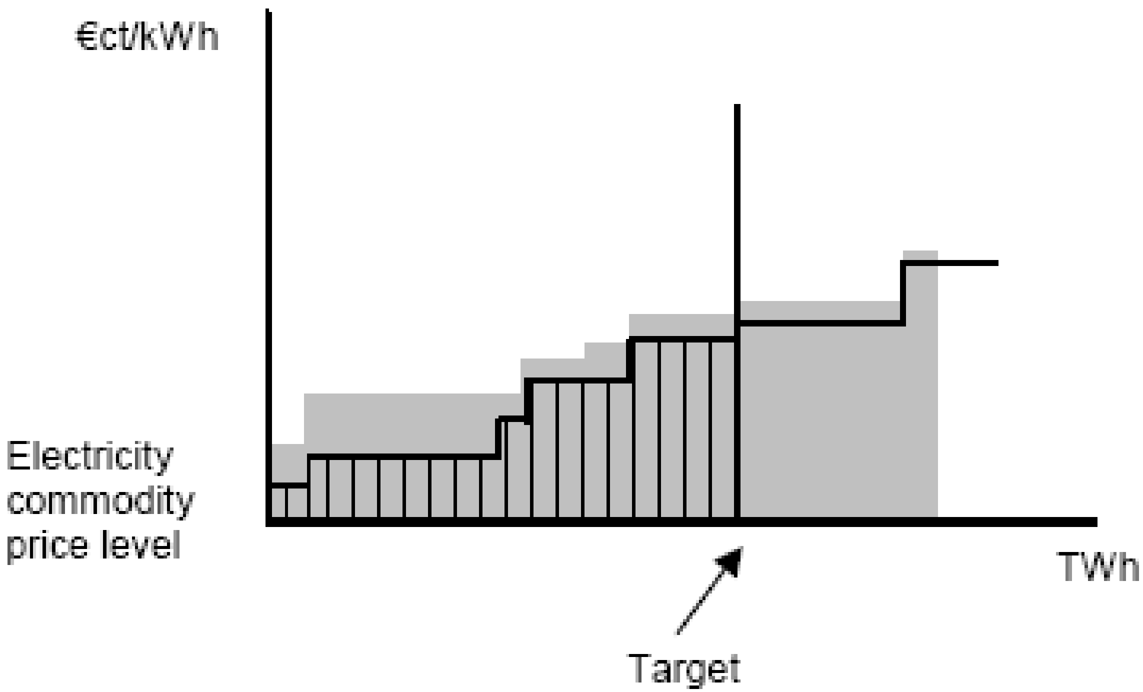
Quota Obligation Scheme



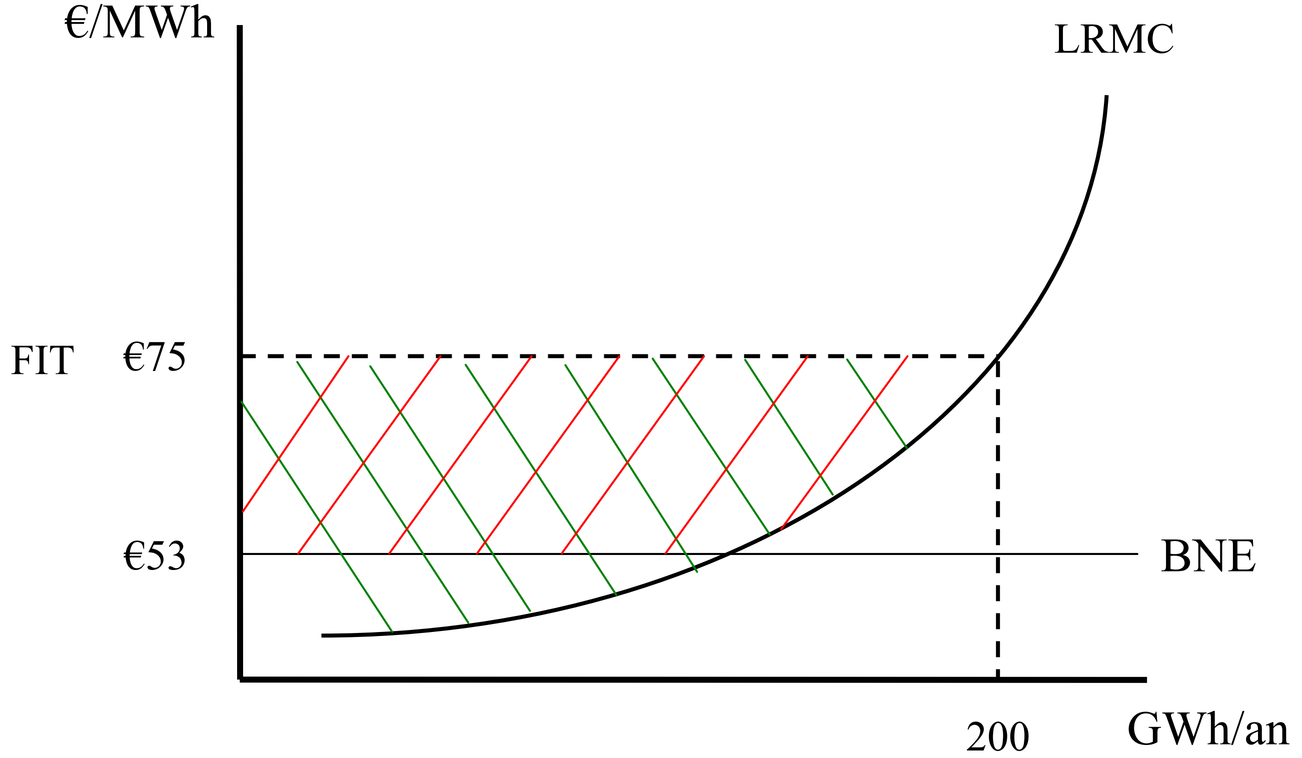
Feed-in Tariff Scheme

- All qualifying electricity from RES is paid a premium price
- Government sets the price
- Utilities obliged to purchase this at set price
- Usually different by technology
- Quantity not directly determined

Supply Curve – Feed-in Tariff



Resource Cost Curves & Mechanisms – EEG Study



Feed-in Tariff

Tendering Scheme

- Government administered competitive bidding process
- Power purchase agreements and/or administered fund
- Usually separate technology bands
- Utilities obliged to purchase at price bid

Other Support Mechanisms

- Capital Grants
  - Specific €/kW or % grants
- Tax Incentives
  - Exemption from tax for electricity from RES
  - Tax refunds for renewable electricity
  - Eligible investments relieved of income or corporation taxes
- Green Marketing
  - Premium paid by consumer

Review of Experience

RES – E Target Capacity Gap in Nov 2004

	Onshore Wind	Offshore Wind	Bioenergy	Hydro	Ocean	Total
Generation in Nov 2004 (MW)	208	25	26	238	0	497
Capacity Needed by 2010 to meet RES-E target (MW)	965	135	92	239	1	1,432
Capacity Gap (MW)	757	110	66	<1	1	935

Status		Onshore Wind (MW)	Offshore Wind (MW)	Bioenergy (MW)	Hydro (MW)	Total (MW)
Generating	As at Nov 2004	208	25	26	238	497
2010 RES-E target	Total Capacity Required	965	135	92	239	1,432
	Nov 2004 Capacity Gap	757	110	66	<1	935
Under Construction in Nov 2004	AER PPA, Connection Agreement	145	0	0		145
	Merchant Plant / AER VI Reserve List, Connection Agreement	107	0	0		107
Not Yet under Construction in Nov 2004	AER PPA, Connection Agreement	60	0			60
	AER PPA, Grid Offer	42	0			42
	AER PPA	<176	<50	<27		<253
	Connection Agreement	240	50			290
	No AER PPA or Connection Agreement	,1,688				<1,688

Wind Energy Projects at Nov 2004

Grid Connection Status at Nov 2004	AER I & III/Valoren/ Thermie (MW)	AER V (MW)	AER VI (MW)	AER VI Reserve (MW)	Merchant (MW)	Unknown PPA Status (MW)	Total (MW)
Connected	104	37	9	0	83	0	233
Signed Agreement	0	27	178	381		15	601
Live Offer	0	14	28	0	0	0	42
Application Complete	0	<20	<206	>>15		<1,673	1,914
Total	104	97	421	>>396	>83	<1,648	2,789

Support Schemes in the EU

Obligation scheme

Feed-in Tariff Scheme

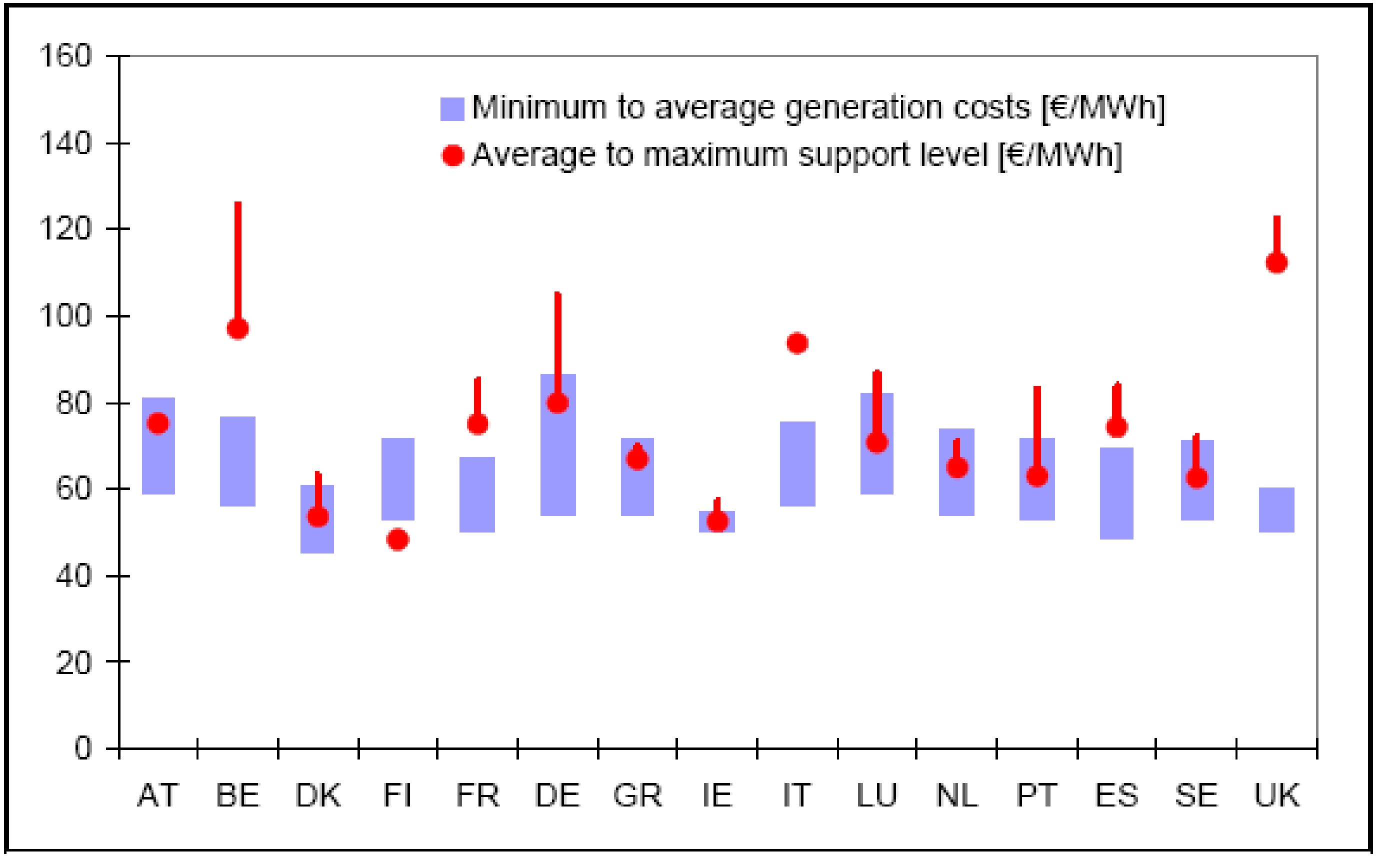
Country	Main electricity support schemes
Austria	Feed-in tariffs (now terminated) combined with regional investment incentives.
Belgium	Quota obligation system / TGC[27] combined with minimum prices for electricity from RES.
Denmark	Premium feed-in tariffs (environmental adder) and tender schemes for wind offshore.
Finland	Energy tax exemption combined with investment incentives.
France	Feed-in tariffs.
Germany	Feed-in tariffs.
Greece	Feed-in tariffs combined with investment incentives.
Ireland	Tendering scheme. It has been announced that the tendering scheme will be replaced by a feed-in tariff scheme.

Italy	Quota obligation system / TGC. Anew feed-in tariff system for photovoltaic valid since 5th August 2005.
Luxembourg	Feed-in tariffs.
Netherlands	Feed-in tariffs.
Portugal	Feed-in tariffs combined with investment incentives.
Spain	Feed-in tariffs.
Sweden	Quota obligation system / TGC.
UK	Quota obligation system / TGC.

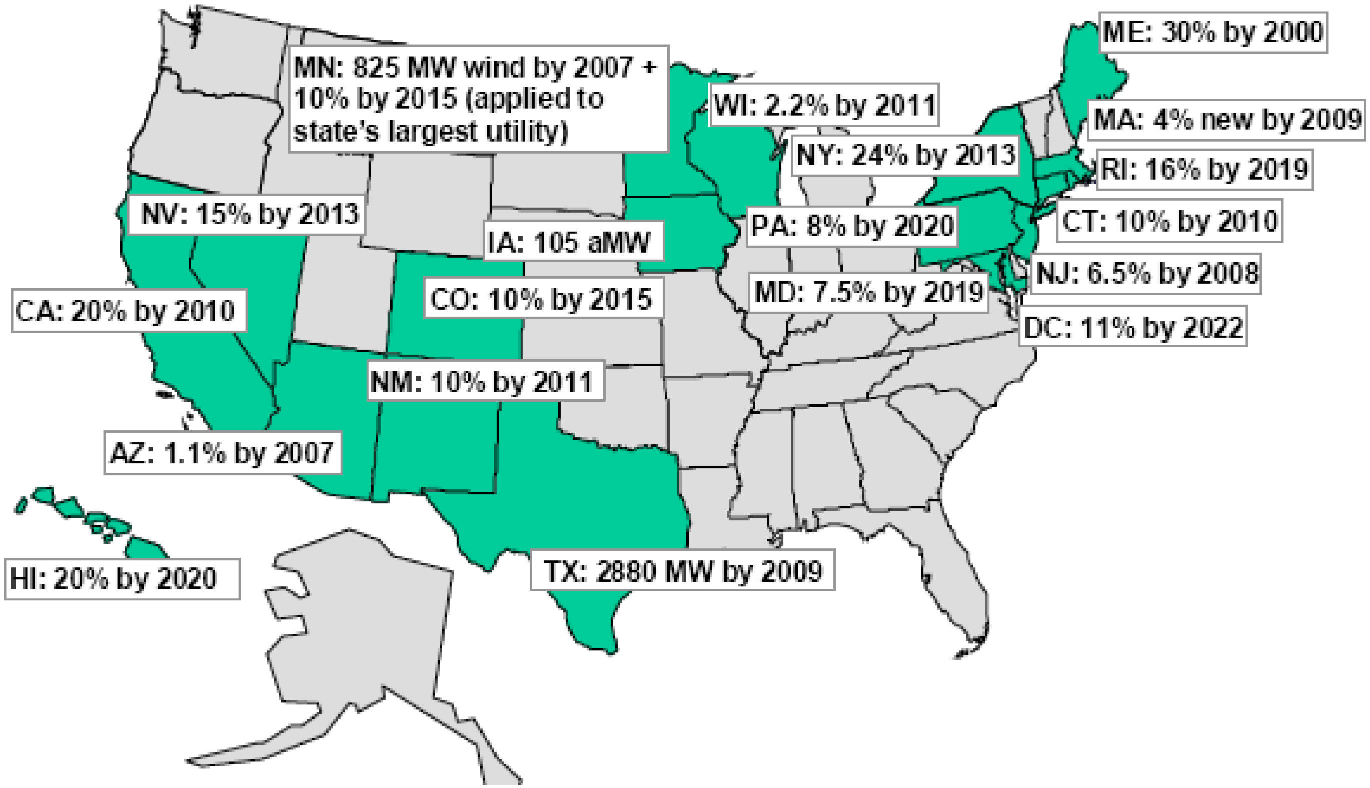
Country	Main electricity support schemes
Cyprus	Grant scheme for the promotion of RES (since February 2004) financed through an electricity consumption tax of 0.22 E/kWh (since Aug. 2003).
Czech Republic	Feed-in tariffs (since 2002), supported by investment grants Revision and improvement of the tariffs in February 2005.
Estonia	Feed-in tariff system with purchase obligation.
Hungary	Feed-in tariff (since January 2003) combined with purchase obligation and tenders for grants.
Latvia	Quota obligation system (since 2002) combined with feed-in tariffs.

Lithuania	Relatively high feed-in tariffs combined with a purchase obligation. In addition good conditions for grid connections and investment programmes.
Malta	Low VAT rate for solar.
Poland	Green power purchase obligation with targets specified until 2010. In addition renewables are exempted from the (small) excise tax.
Slovak Republic	Programme supporting RES and energy efficiency, including feed-in tariffs and tax incentives.
Slovenia	Feed-in system combined with long-term guaranteed contracts, CO_2 taxation and public funds for environmental investments.

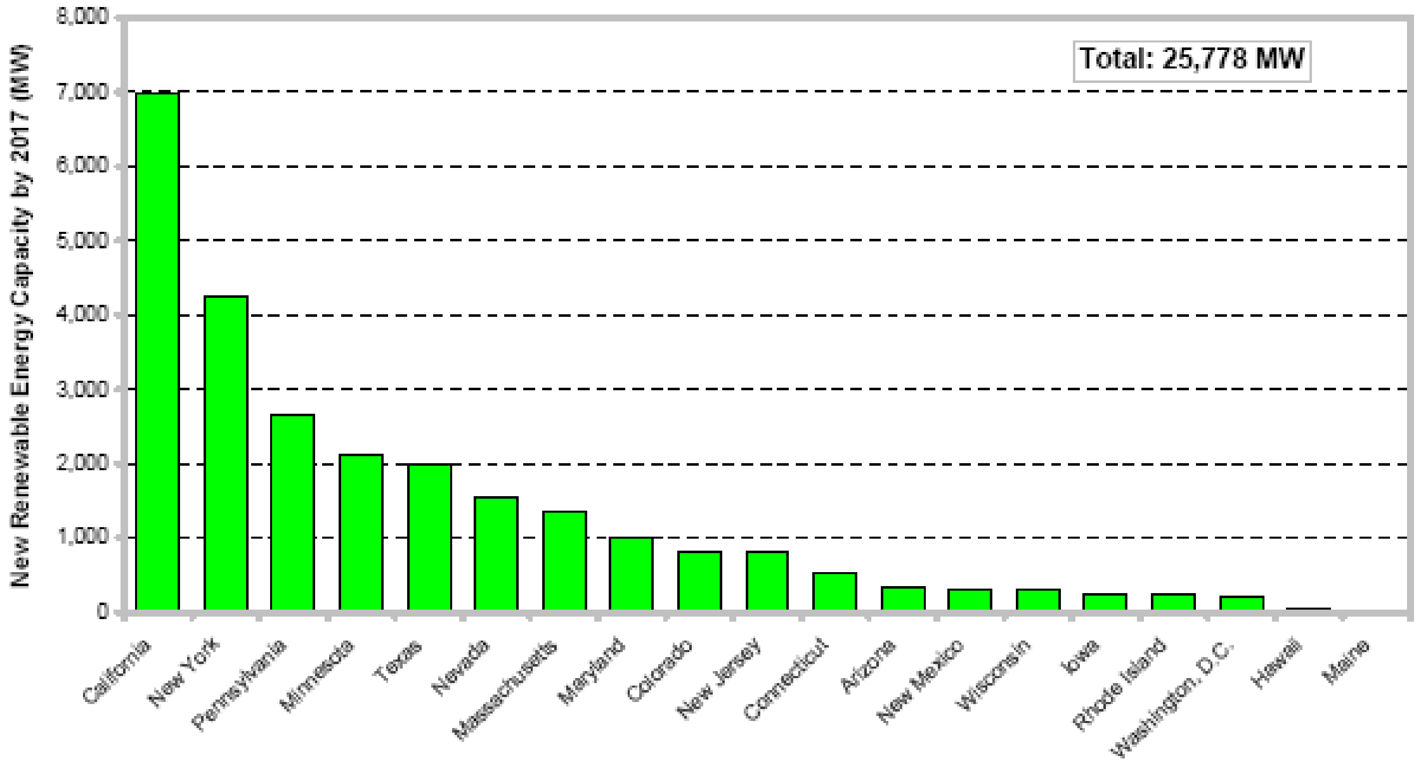
Price ranges (average to maximum support) for direct support of wind onshore in EU-15 Member States (average tariffs are indicative) compared to the long-term marginal generation costs (minimum to average costs). Support schemes are normalised to 15 years.



US RPS Systems



Projected Impact of US RPS Schemes by 2017



Quota Obligation Scheme

- Cost of system not known in advance
- Design ensures that targets are met using least expensive technology
- Strong incentive on producers to reduce costs
- May provide excess profits for existing and new capacity
- Short-term emphasis on low cost compliance may not bring more expensive technologies down learning curve

Feed-in Tariff Scheme

- Creates market stability; may keep financing costs down
- little information on true production costs
- hard to set support level
- may give some producers windfall profits
- has been most effective measure for on-shore wind
- perceived as government interference in market

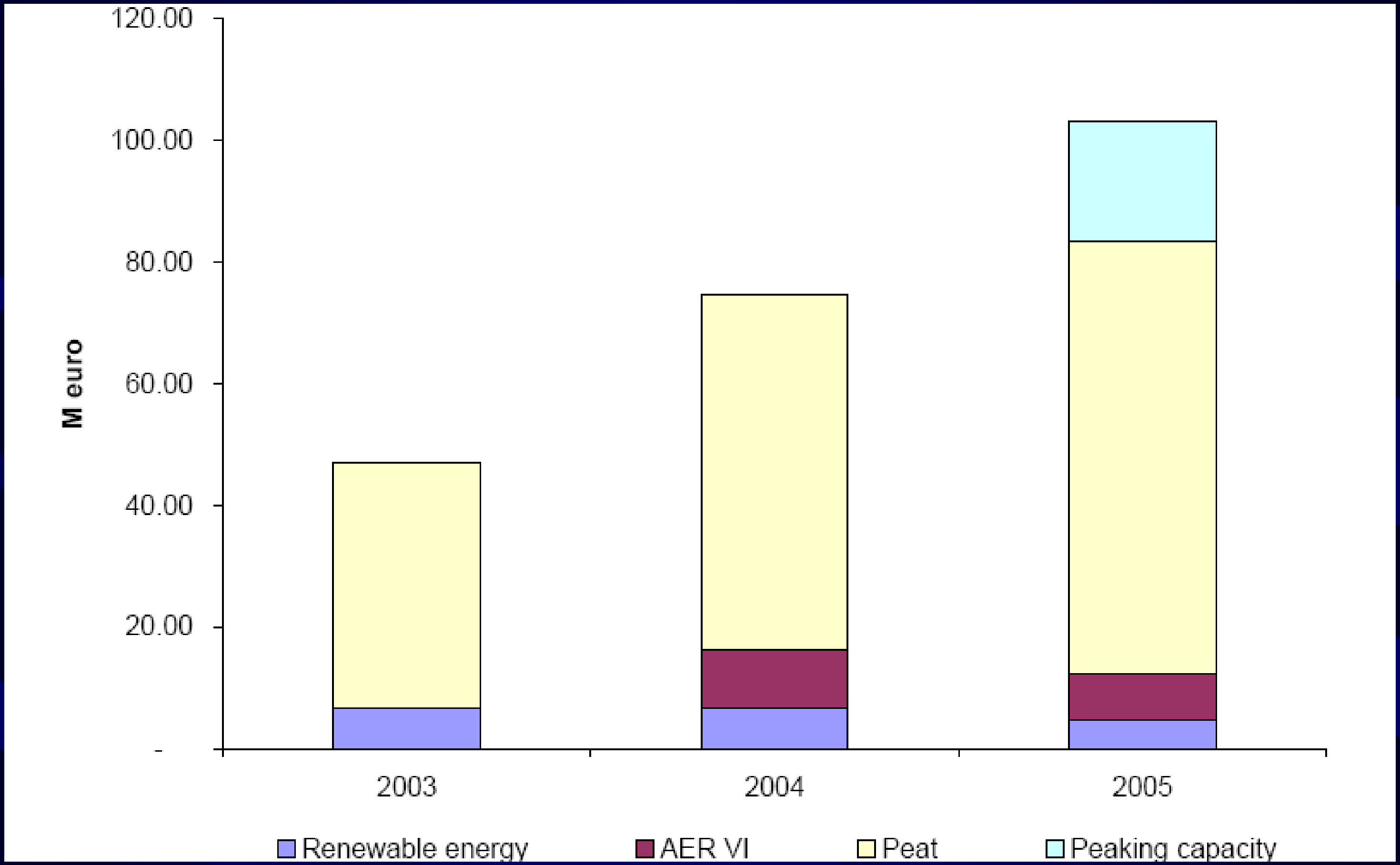
Tendering Scheme

- “Stop-go” nature not conducive to sustained development
- Doesn’t always result in best projects

Other Support Mechanisms

- Capital Grants
  - increasingly unpopular with governments
- Tax Incentives
  - only incentive in Malta & Finland
  - additional incentive in UK, Czech Rep., Cyprus
  - popular from time to time in US
- Green Marketing
  - limited experience (e.g. NI)
- Research and Development Support

RES-E: Cost Implications – PSO Levy



Tentative Conclusions

- Simple capital grants mixed history
- Link with performance (output) better (e.g. REFIT)
- developers like firm prices with minimum paperwork
- governments like market solutions (e.g. obligations) that minimise use of taxpayers' money
- 80% of new wind energy output in EU (1993 –9) occurred in the 3 countries then operating REFIT schemes

Issues for Ireland

Issues for Ireland

- Cannot have unconstrained renewables growth
- Single Electricity Market, 2007
- border issues
- East-West market issues
- International and local concensus on feed-in tariff scheme

REFIT Ireland

- Announced in outline Sep 05
- €119m over 15 year period
- Minimum of 400 MW of new capacity
- Wind (>5 MW): €0.057 / kWh
- Wind (<5 MW): €0.059 / kWh
- Hydro, biomass: €0.072 / kWh

Current Status of Renewables

- RES – E Target ~ 1,450 MW
- Currently have approximately 845 MW:
  - 570 MW Wind
  - 240 MW Hydro
  - 35 MW Bioenergy

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