

Financial Incentives for RE Policy an Overview

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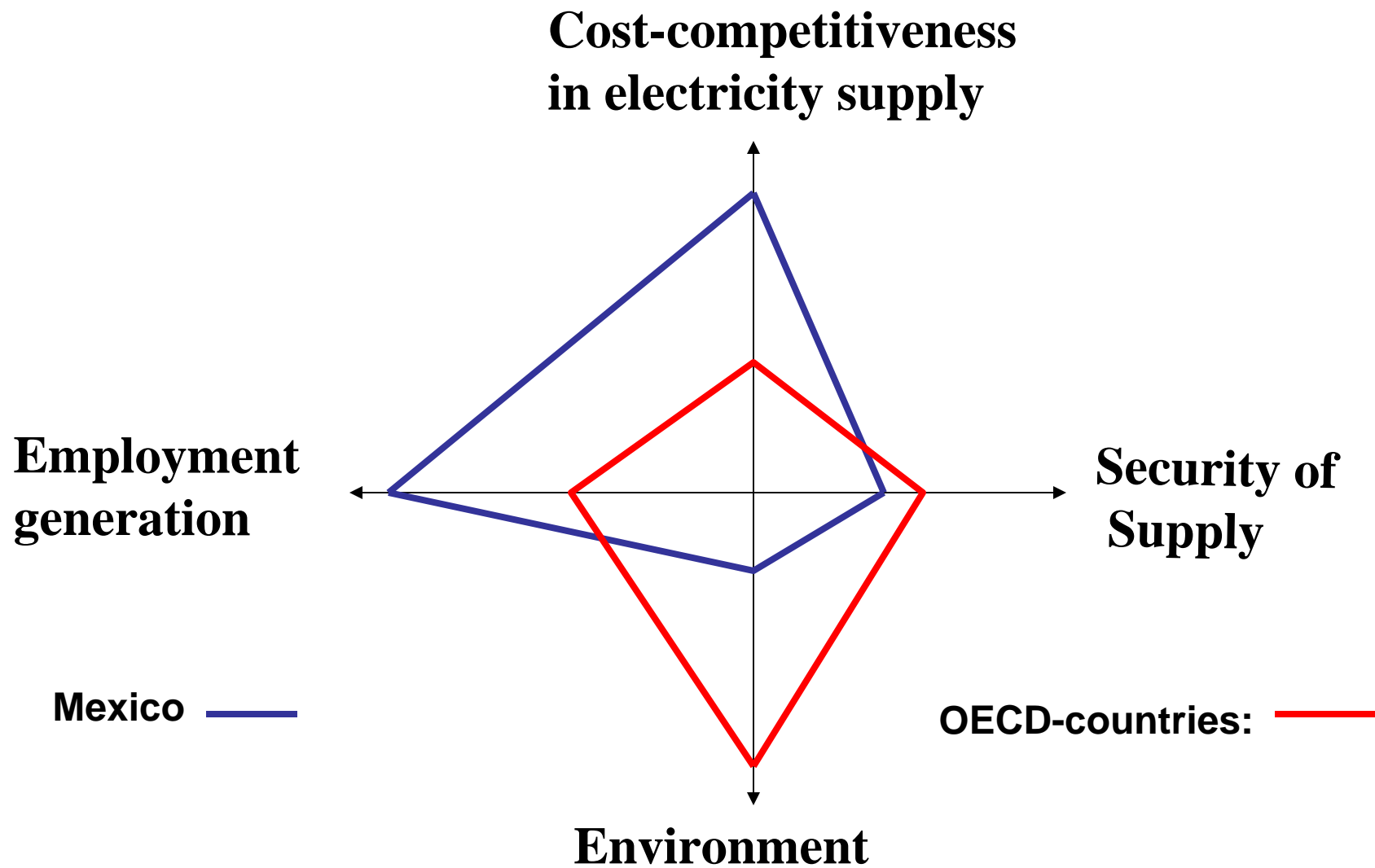
**INTERNATIONAL GRID-CONNECTED RENEWABLE
ENERGY POLICY FORUM**

Mexico City, February 1-3, 2006

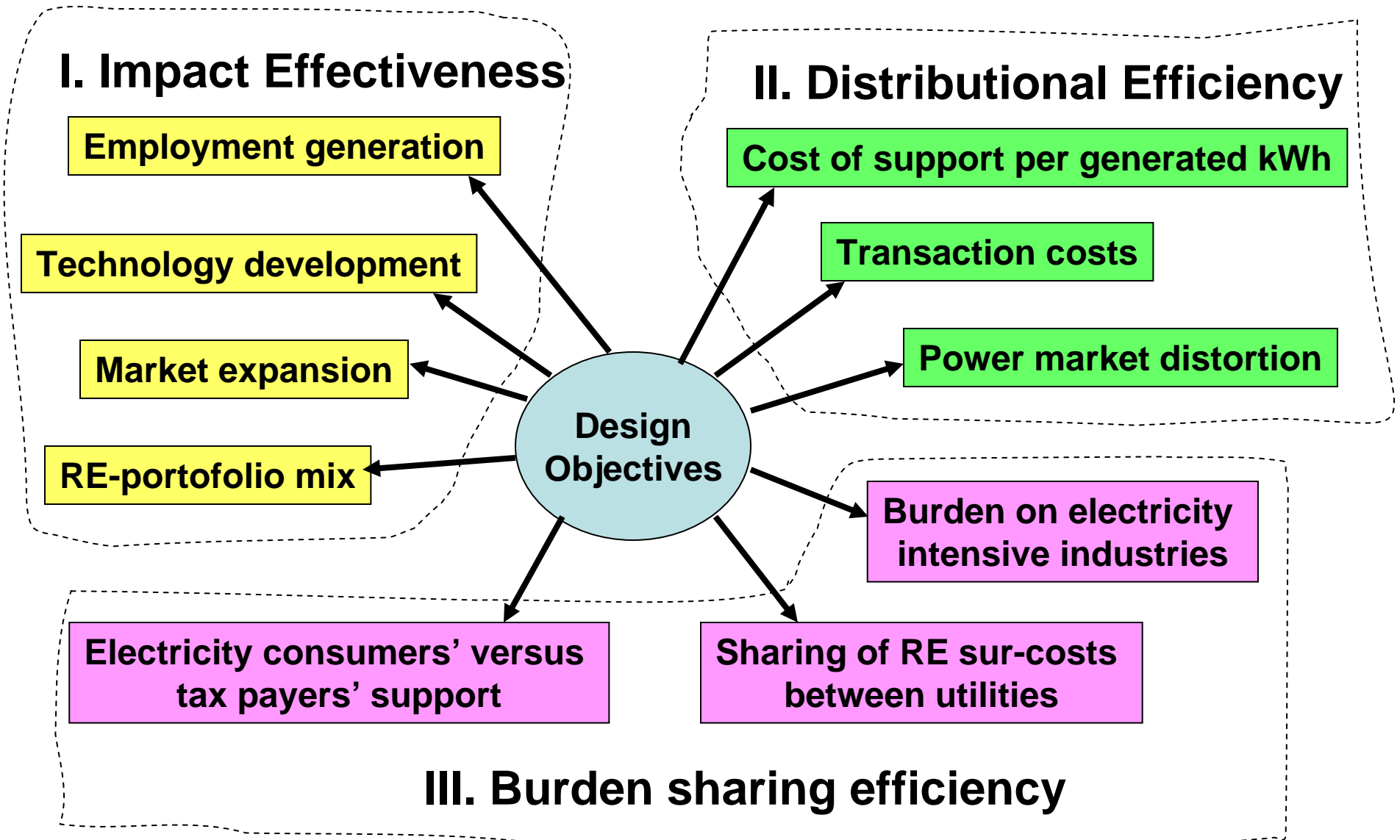
Definition of Support (subsidy)

- The total cost, to either the public budget or to the electricity consumer, of purchasing renewables rather than buying electricity at a price which reflects no government intervention

Drivers for Windenergy Policy



Design of Support Scheme: Objectives



Expanding through Demand Side and Supply Side Initiatives

DEMAND SIDE INSTRUMENTS
(TGC, green electricity, tax benefits)

Shifting demand preferences towards RE

MARKET FOR RE
(Total + Annual Increments in RE-Supply)

Improving the price competitiveness of RE

SUPPLY SIDE INSTRUMENTS
(investment subsidies, topping up kWh premium, R&D, environmental taxes)

The four Mega-Approaches

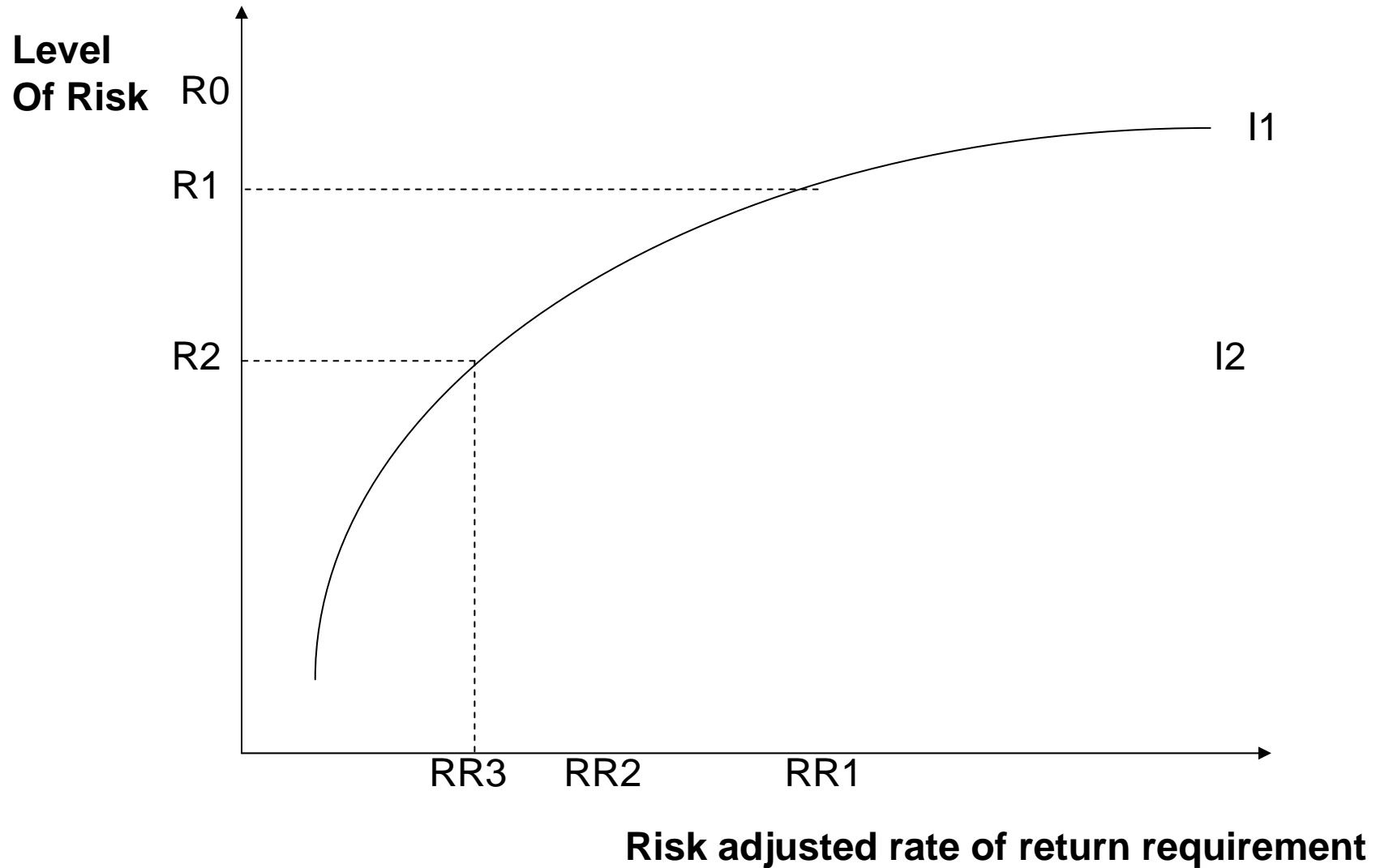
1. The feed-in-tariff (including the fixed premium on top-of-spot market price?)
2. The tradable-green-certificate
3. Periodic tenders for MW (open for any new windfarm or for concessions for windfarms at specific sites)
4. Pure tax-financed support

Financing Mechanisms	•Cost of investment	•Price of output	•Operating Costs
Public Budget Finance Instruments	<ul style="list-style-type: none"> •direct capital subsidies •soft loans •VAT exemption •Import duty exemption •Accelerated depreciation •Tax holidays on income •Subsidies to exporters of RET- equipment •Subsidies to R&D&D 	<ul style="list-style-type: none"> •topping-up premiums to producers •production tax credit •topping-up premiums to consumers •VAT/excise duty exemptions •Public green electricity purchases 	<ul style="list-style-type: none"> •Subsidies to the marketing of green electricity
Electricity invoice financed instruments	<ul style="list-style-type: none"> •Grid reinforcement (deep connection costs) paid by utilities •Part of (shallow) connection costs paid by utilities •R&D&D of power utilities on interfaces between windfarms and regional/national power system 	<ul style="list-style-type: none"> •Premium feed-in-tariffs for RET-electricity •Renewable portfolio standards with or without RECs •Eco-taxes on alternative fuels •Voluntary green consumer premium tariffs 	<ul style="list-style-type: none"> •Wheeling tariff below the true cost of utility •Balancing costs charged to consumers not to generators •Use-of-system charges fixed below cost •Subsidized administration of green invoicing
Subsidized export credits to RETs	<ul style="list-style-type: none"> •Soft loans for RE-investments •Grants for project preparation 		
Greenhouse gas payments		<ul style="list-style-type: none"> •CO₂-certificate •CER-/JI revenue/kWh 	

WT-Manufacturing: National + Regional Goals for Production Share?

- In Spain, the Provincial Governments of regions with large production potential gave an **”additional per kWh subsidy”** to windfarms using WTs with a high regional production share
- In Canada, the Ontario Government uses **tenders for 1000-2000 MW windfarms** using >70% Ontario manufacturing share (share can be lower if produced in disadvantaged regions)
- China: minimum 70% local production share requirement for state concessions

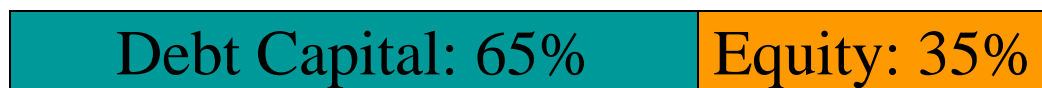
Risk-Rate of Return Curve



Project RoR and RoE Requirements

Project Company

Total Cost of Capital, RoR = 9.1%



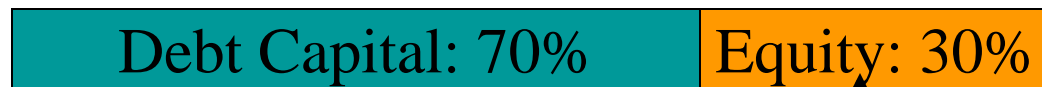
↑
RoI = 7%

↑
RoE = 13%



Individual project investment in windpower plant

Project RoR Requirement = 14.5%



↑
RoI = 10%

↑
RoE = 20-25%

Lender risk premium of 3-4%

Investor transaction cost
recovery + risk premium

Risk and "Hurdle Rates of Return" = Cost of Capital

DTI Renewables Innovation Review

Energy crops with bespoke plant	14%
Marine	14%
Offshore wind	11%
Onshore wind	8%
Landfill	6%

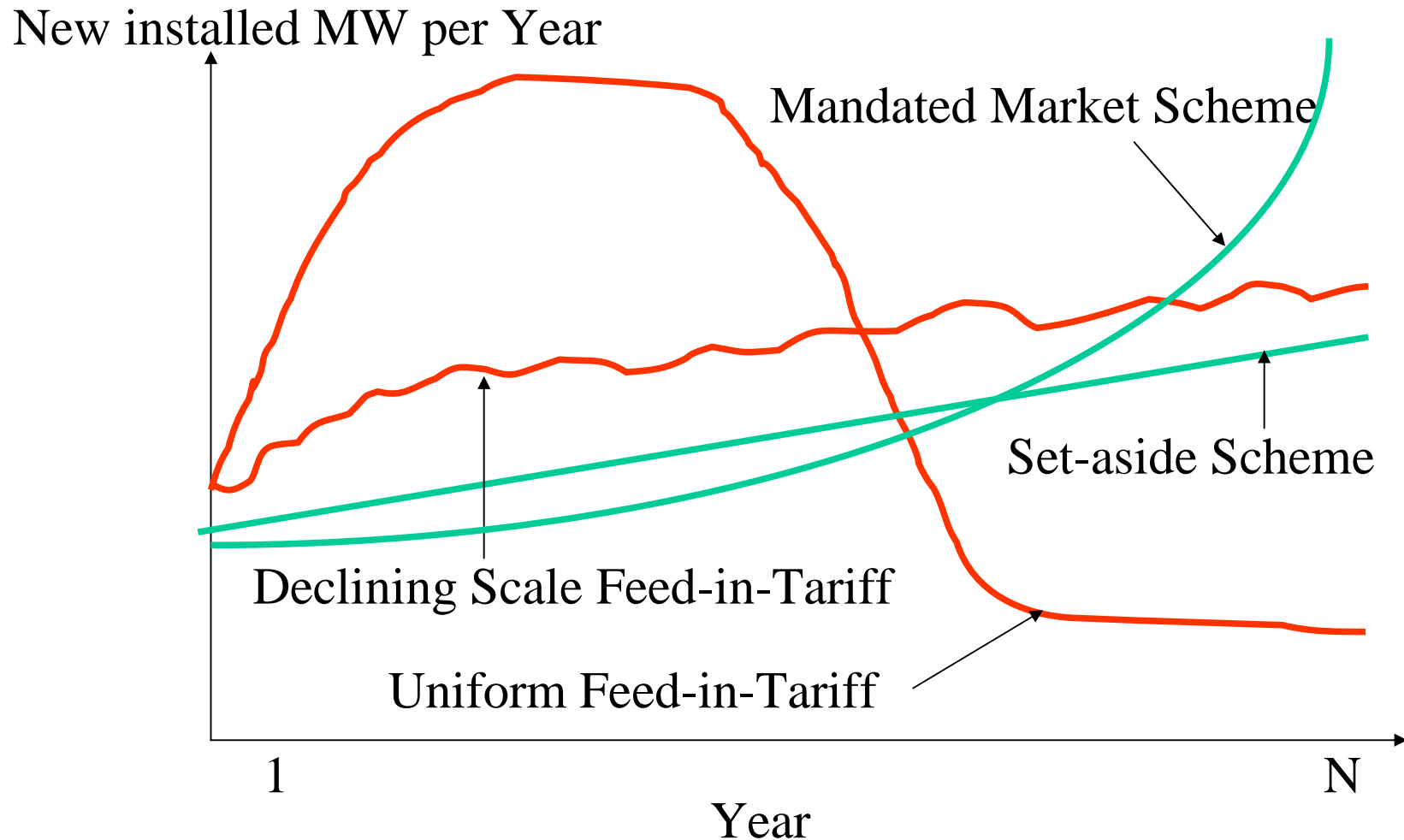
The feed-in-tariff is ideal for investors in windfarms

- There is *no market risk*,
- The project can *be implemented any time during the year* as soon as financial closure has been secured,
- The *formal procedure for signing the PPA* with the system operator / local utility is simple

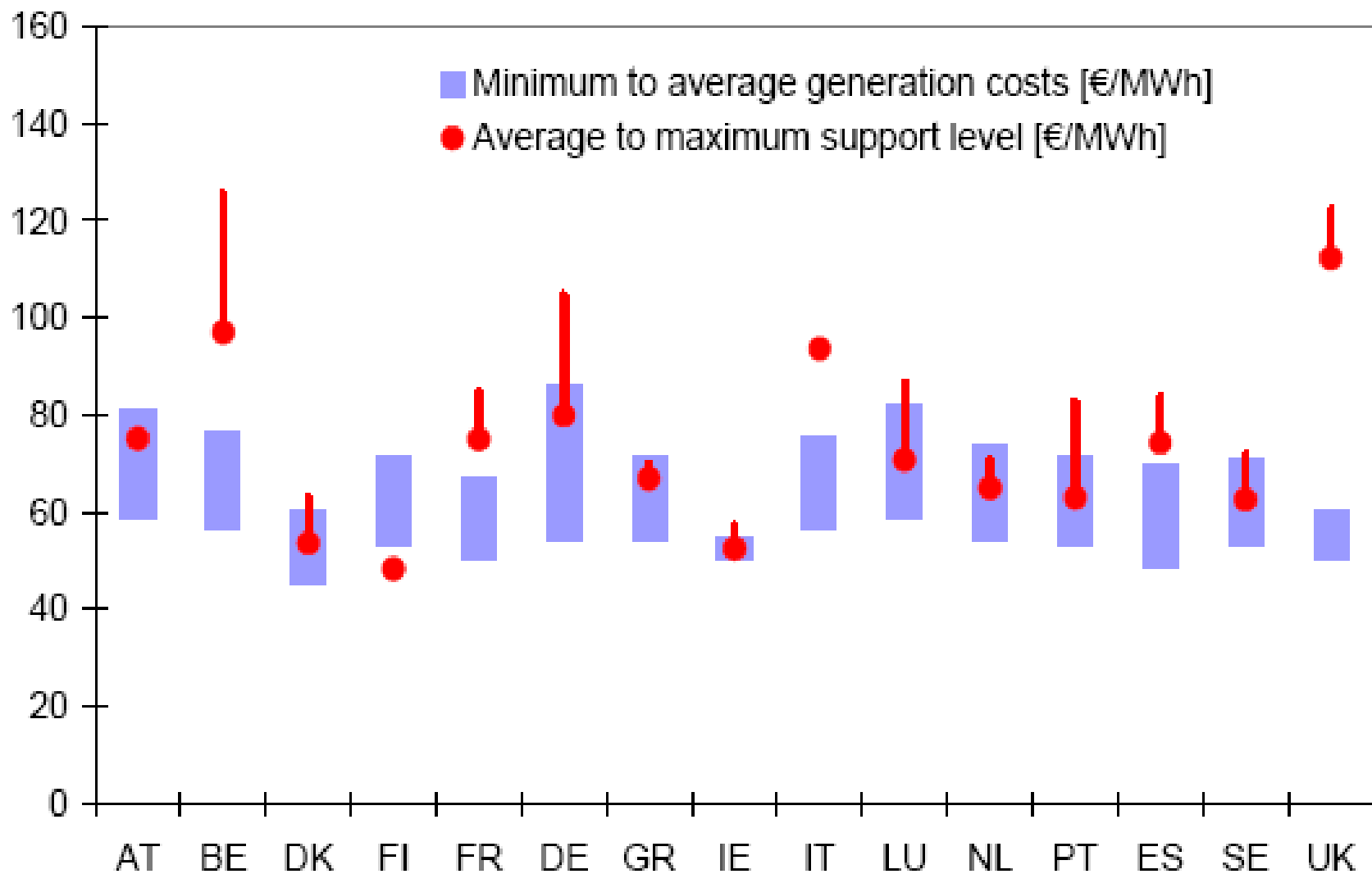
Exploit difference in Private Investor and Public Investor Discount Rates (rate of return requirements)

- A private investor's project rate of return will almost always be higher than the public sector's discount rate for public investments
- In PPAs, offering a higher tariff during first ten years against much lower tariff during next ten years, may be a good public investment. Alternative: guaranteed tariff only for first 25,000 "full capacity hours"

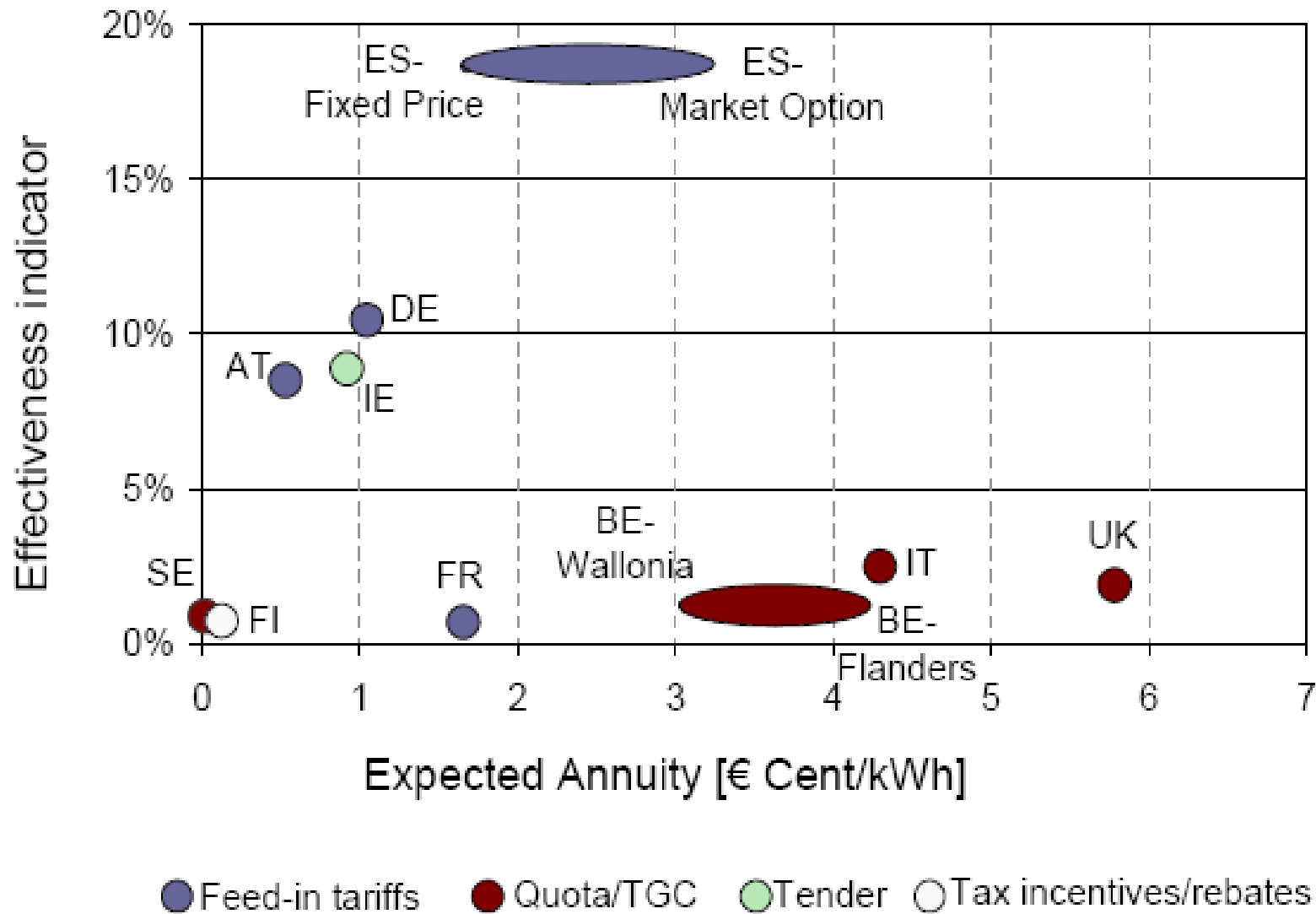
Development of the Windfarm Potential over Time: Price and Quantity Approaches



Price Range for Direct Support in EU Countries to On-Shore Wind



Market Expansion Effectiveness and Net-Return (Income – Expenditure) to Developer



Framework Components

