

Windenergy: Support Systems

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Content:

- **Support Systems**
- **New Feed-In-Law in Germany**
- **Finance Crisis**
- **Summary**

Requirements for Support Systems

1. Removal of non-economic barriers
2. Predictable and transparent support system
3. Transitional incentives, decreasing over time
4. Development of appropriate incentives to different technologies depending on their maturity
5. Early consideration of high-scale impact of renewables on the overall energy system

Non-economic aspects:

- Building permission, duration
- Acceptance
- Hub height limitation
- Distance requirements

Building Permission:

- Many authorities require numerous new studies about the impact over time

Or:

One authority makes a list of requirements which is binding. Time schedule is very short (1-2 year)

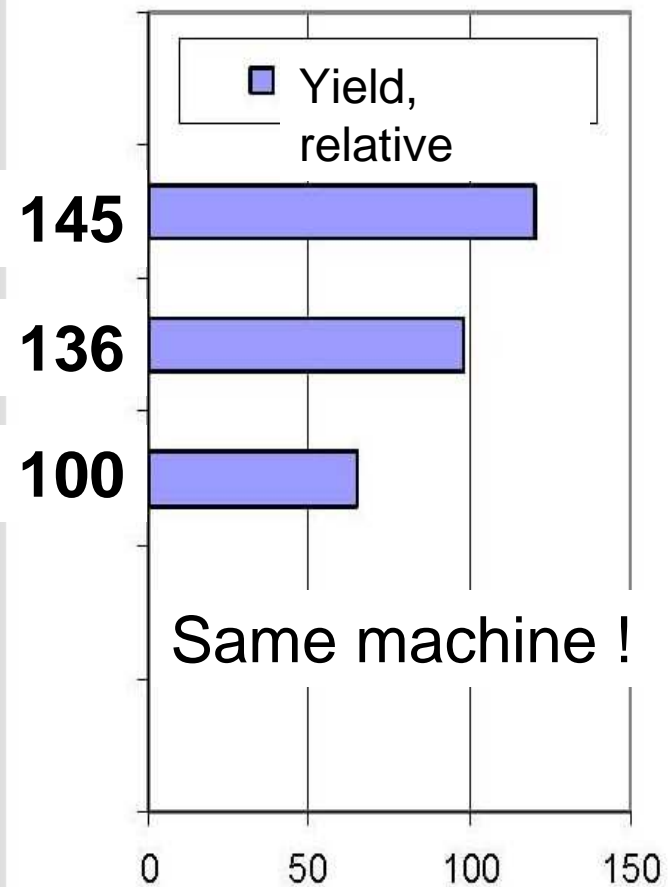
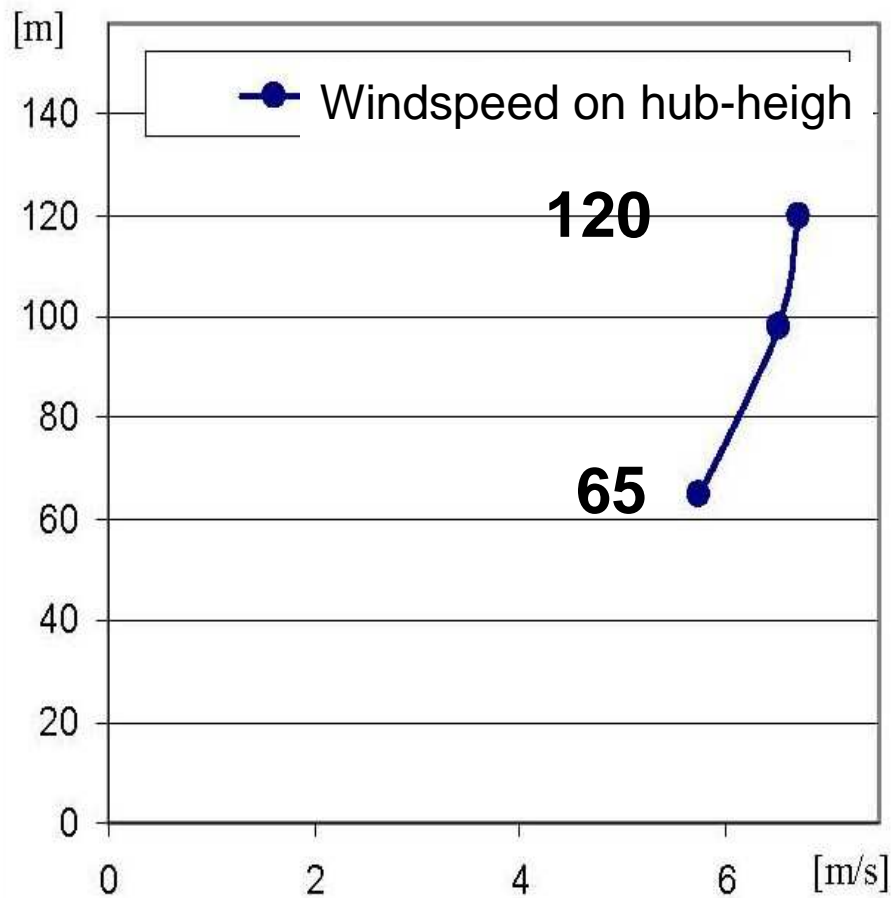
Acceptance:

-All taxes and increase in value are going out of the region

Or:

The community is benefitting from local tax

Hub height limitation



Distance requirements:

General distances of some kilometers

Or:

Specific distances:

- Noise
- shadow (not in northern direction)
- depending on sub species (birds). Not every species has the same sensitivity.

Definition of Remuneration Level

$$NPV = \sum_{t=1}^n \frac{\text{Remuneration level}_t}{(1 + i)^t}$$

$$A = \frac{i}{(1 - (1 + i)^{-n})} * NPV$$

NPV → Net present value

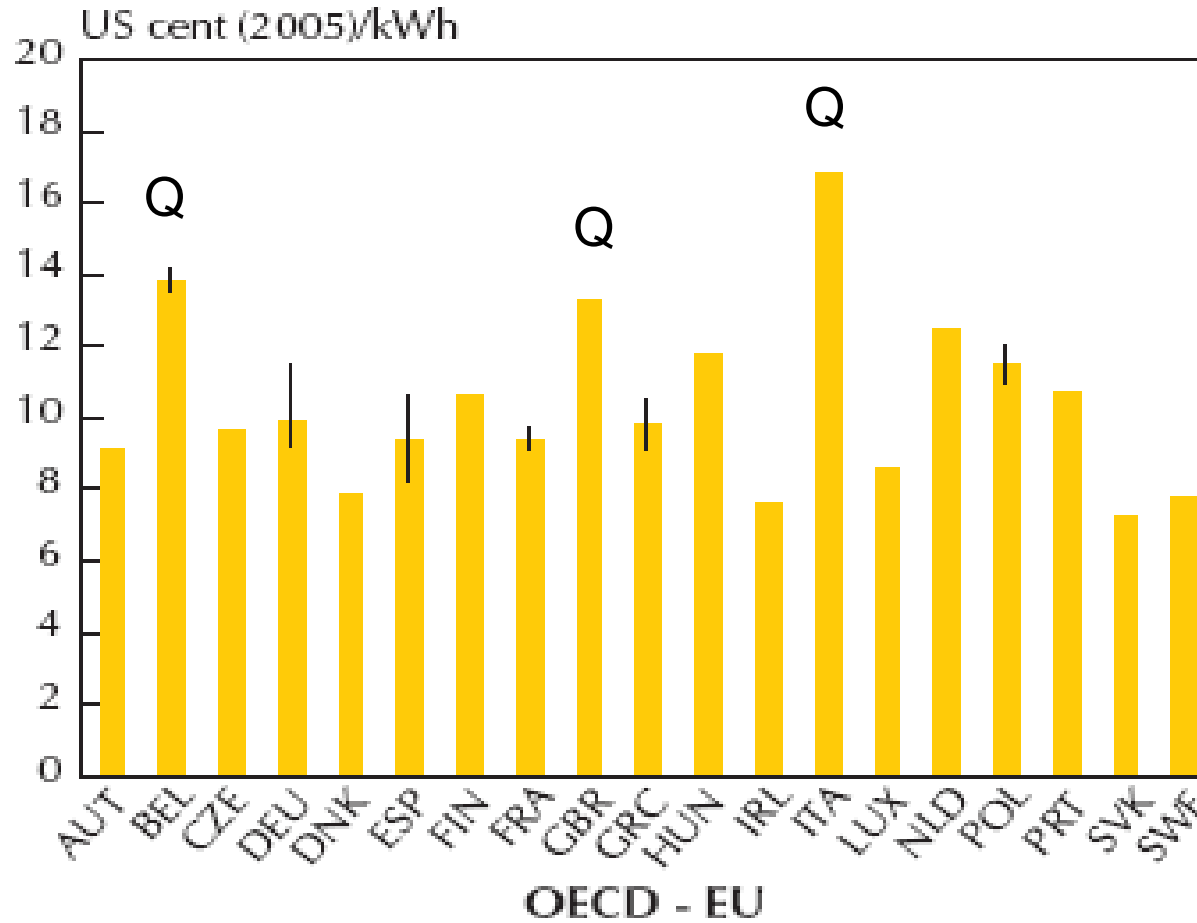
A → Annualised remuneration level

i → interest rate

t → year

n → Payback time

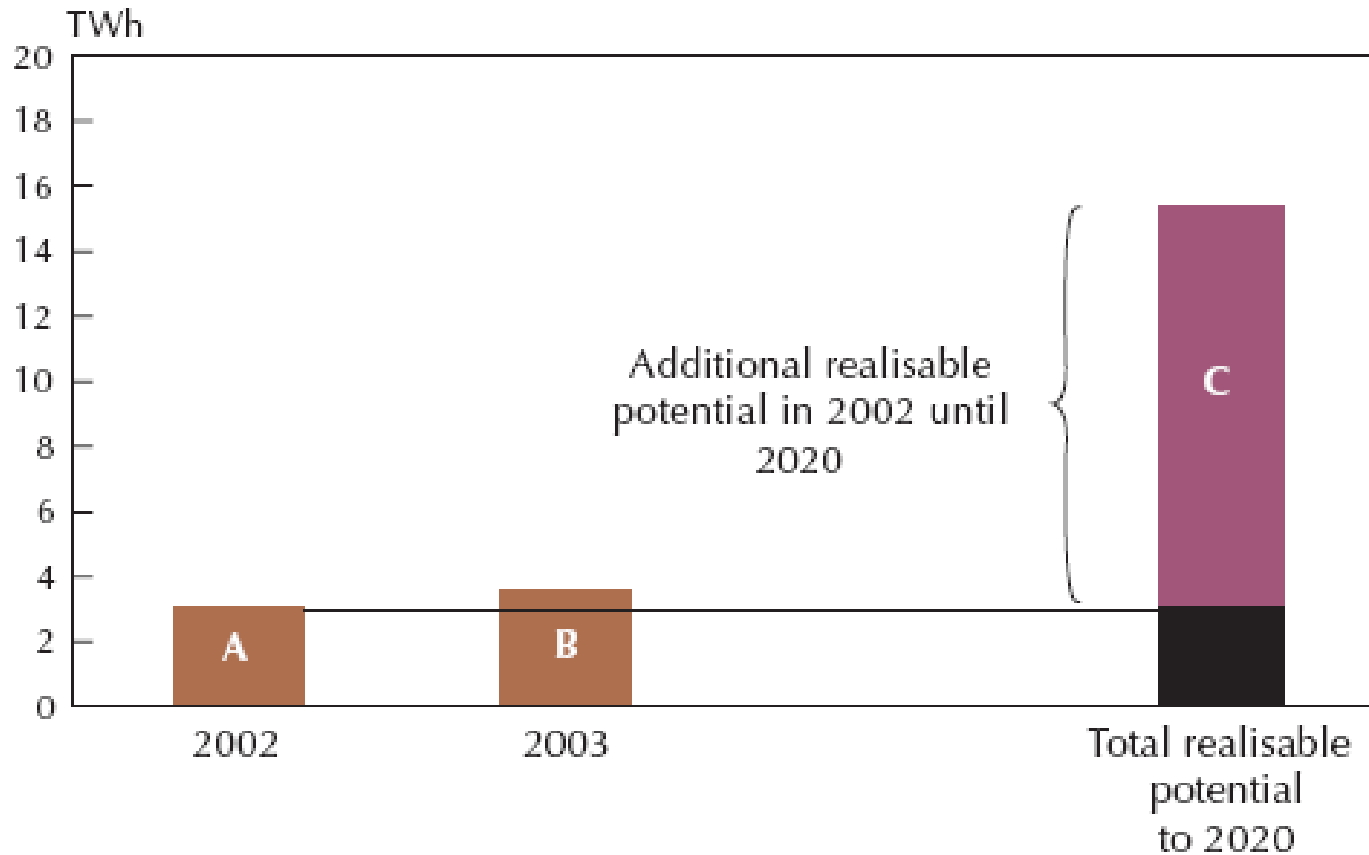
Remuneration Level



Q = Quota systems

Remuneration level (US cent [2005]/kWh)

Definition of Effectiveness

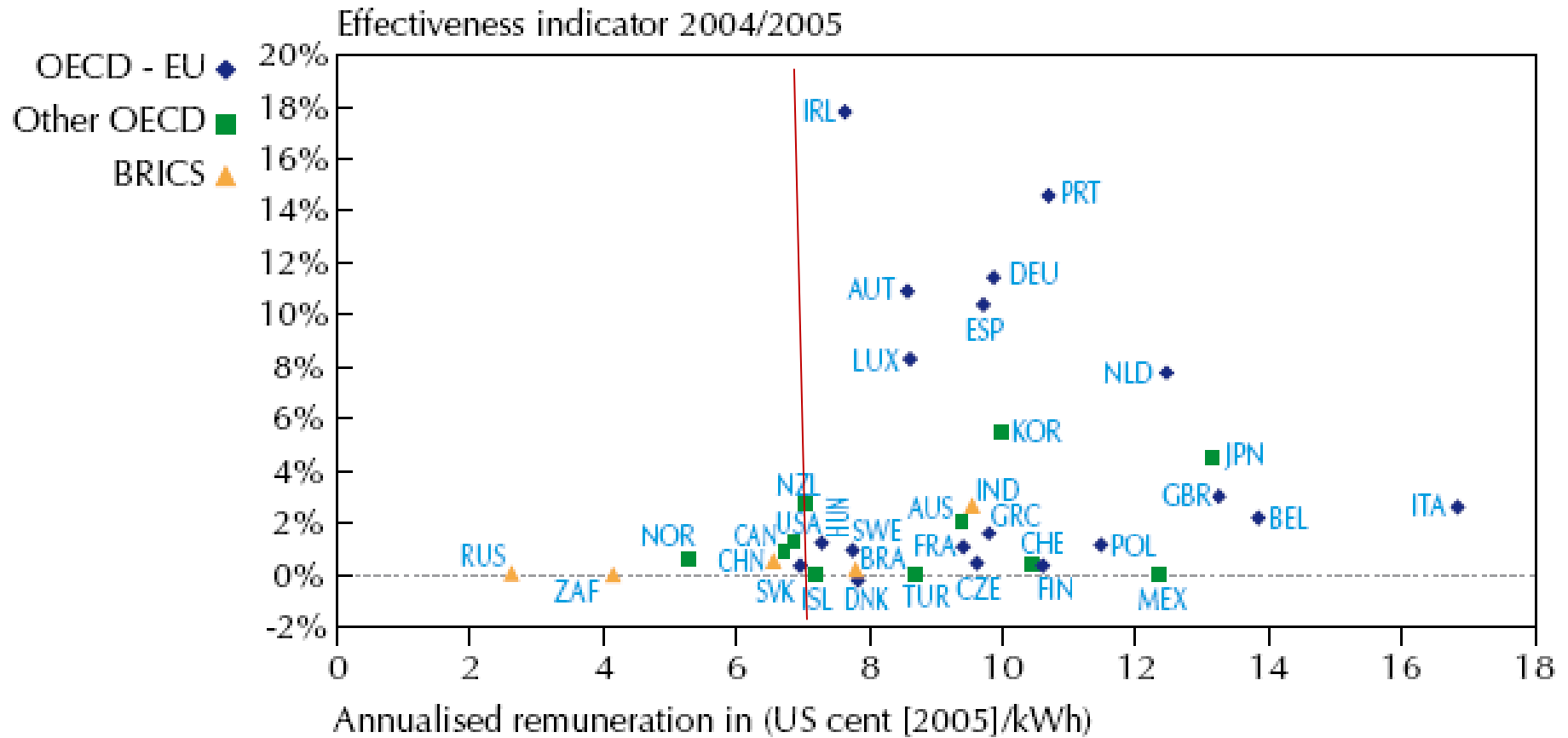


Effectiveness indicator represents the RES-E produced compared to the remaining potential
 $E = (B-A)/C$

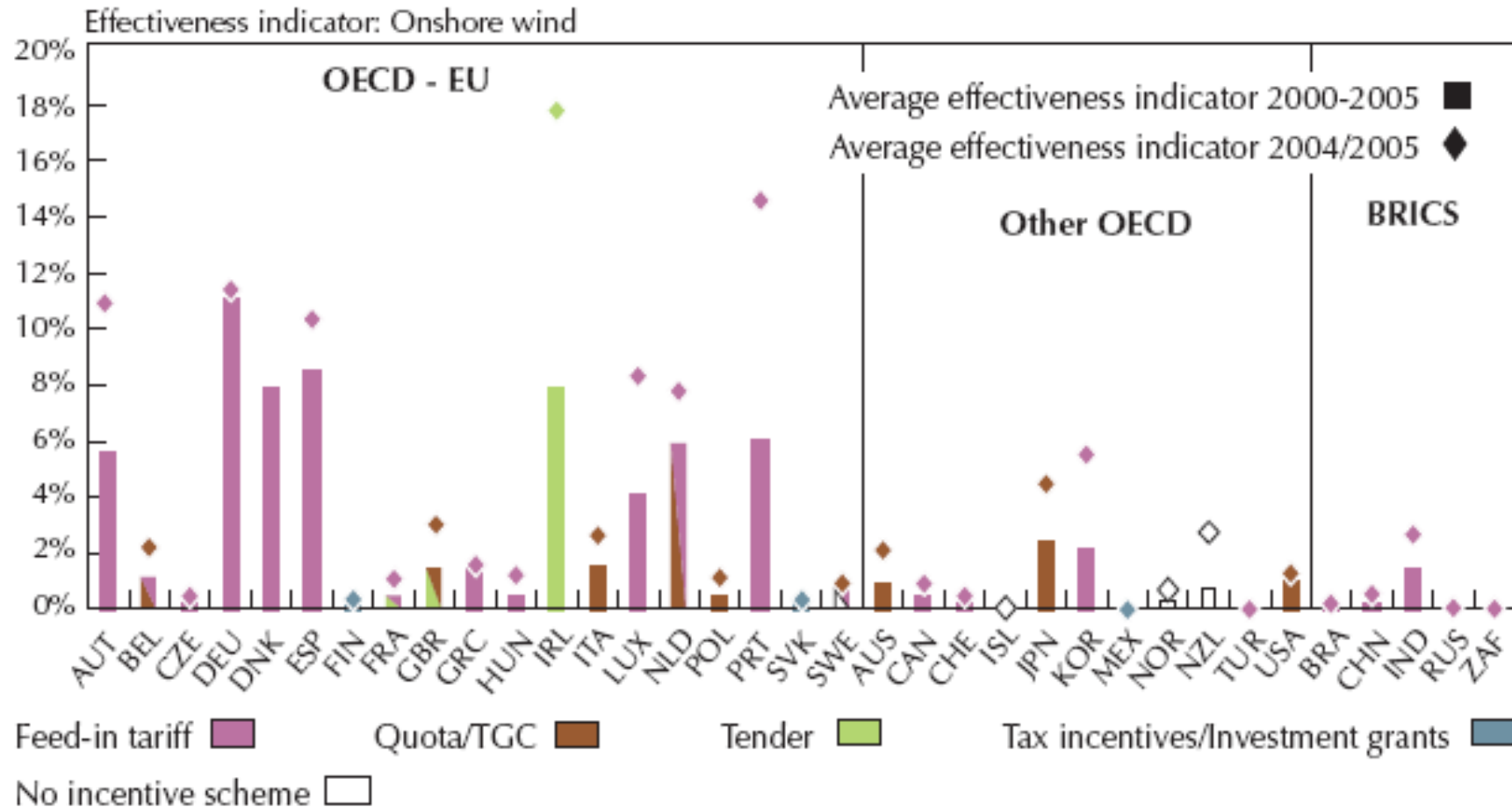
Source: IEA; Ragwitz & Held (2007b).

Ragwitz, M. and A. Held (2007b), *Policy effectiveness and support level efficiency of market deployment policies for RET – Methodological introduction*, Report prepared for the International Energy Agency, Fraunhofer Institute Systems and Innovation Research, Karlsruhe.

Effectiveness Indicator

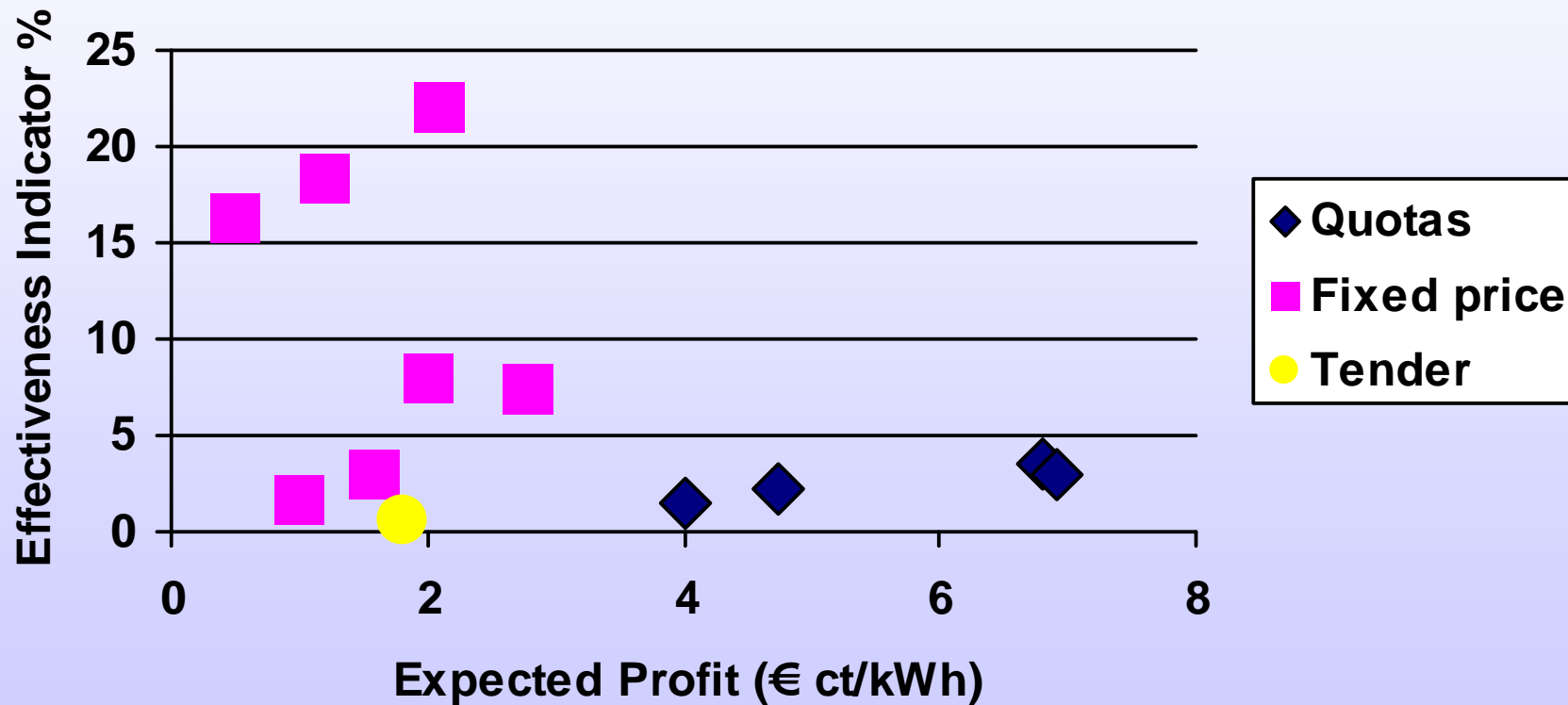


Effectiveness Indicator: Onshore Wind



Source: Based on IEA calculations & Ragwitz et al. (2008).

Effectiveness Indicator: Onshore Wind



Feed-in-Law Germany

- fixed price for 20 years**
- obligation for utilities to buy**
- everyone can operate a turbine**

Degression

	%/a
Wind onshore	1
repower	1
offshore	5 from 2015 on
Duration	20 years

New:

- **Market player can leave Feed-in-system after announcement**
- **grid-integration-bonus (0,5 ct/kWh) for delivering reactive power etc.**

Feed-In-Law 2009

Tariffs for Windenergy 2009

	ct/kWh
Wind onshore than	9,2 for 5 years at least, 5,1 depending on site
Wind Repowering	9,7; later 5,1
Wind offshore	13 for 12 years +2 by starting until 2015

Consequences of finance crisis for Renewables

- in general renewables are concerned like all other branches
- 2009 might be a light dent in Installation because banks get not so much money as needed
- but last years no insolvencies

- at the beginnig of finance crisis more investments in renewables. very large security over whole refinancing time (20 years, Feed-in-Law)
- small projects easier to finance by local partnes
- offshore projects (500 mio. €) are needing other guaranties

Consequences of finance crisis for Renewables



- KkW (German development bank) is extending the kredit volume for one project from
- 10 Million € to 50 Million €
 - Term is extended from 8 to 15 years.

Consequences of finance crisis for Renewables

The future

- more money will be available looking for reliable investment

**150 GW will need another
200 Billion €
until 2020 (EU)
(+400 Billion € until 2030)**

Political Steps for introducing a successful Support System



- Setting long-term targets
- Making a feasibility study for grid
- Making a cost-study
- Creating a support system like Feed-in, which gives high reliability to many investors
- Obligation für TSO, to take and buy all electricity from RES by priority
- Watching the development by independent institutes.
- Controlling and adapting law after a few years.

Summary:

- **stable political framework and**
- **high reliability for private investors**

**DIRECTIVE OF THE EUROPEAN PARLIAMENT
AND OF THE COUNCIL**
no. 17086/08; passed 11.12.2008 by EU-Parliament
on the promotion of the use of energy from renewable
sources

- binding target 20% RES (primary consumption) until 2020
- **no** eu-wide certification trade system
- each country can use its own support system
- interim reports about improvements
- trade with renewables only on federal level.

Wind and Art



Thanks
for your
attention!