



Renewable Energy policies in the EU Member States

Indicators assessing market status & policy performance

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Main support policies for RES electricity

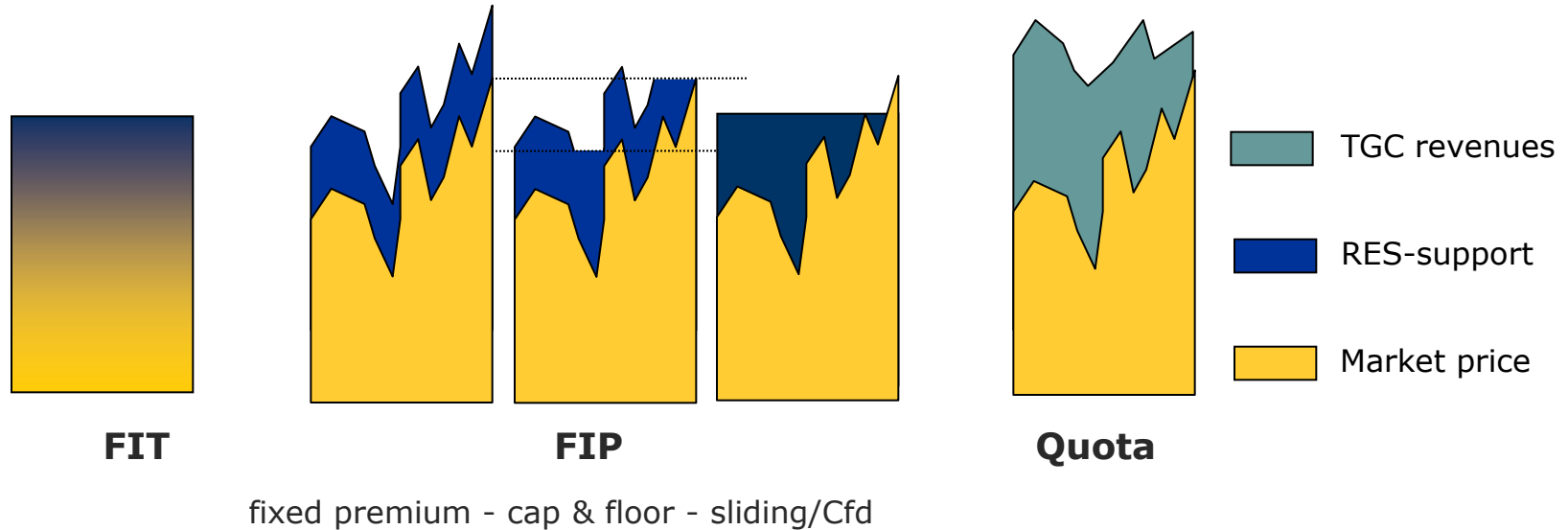


- Feed-in tariffs
- Feed-in premiums
- Quota obligations with tradable green certificates
- Loan guarantees
- Soft loans
- Investment grants
- Tax incentives
- Tendering schemes

Also very relevant:

- Permitting procedures
- Grid access & operation
- Power market design & structure
- R&D, industrial policy

Key features FIT, FIP & Quota



Fixed feed-in tariff (FIT)

Gov fixes price, market decides quantity

- Fixed tariff (€/MWh)
- Guaranteed during lifetime or x years
- Purchase obligation
- (Grid (access & use) priority)

Feed-in premium (FIP)

- Fixed premium (€/MWh)
- Guaranteed during lifetime or x years
- Power sold on conventional markets

Quota

Gov fixes quantity, market decides price

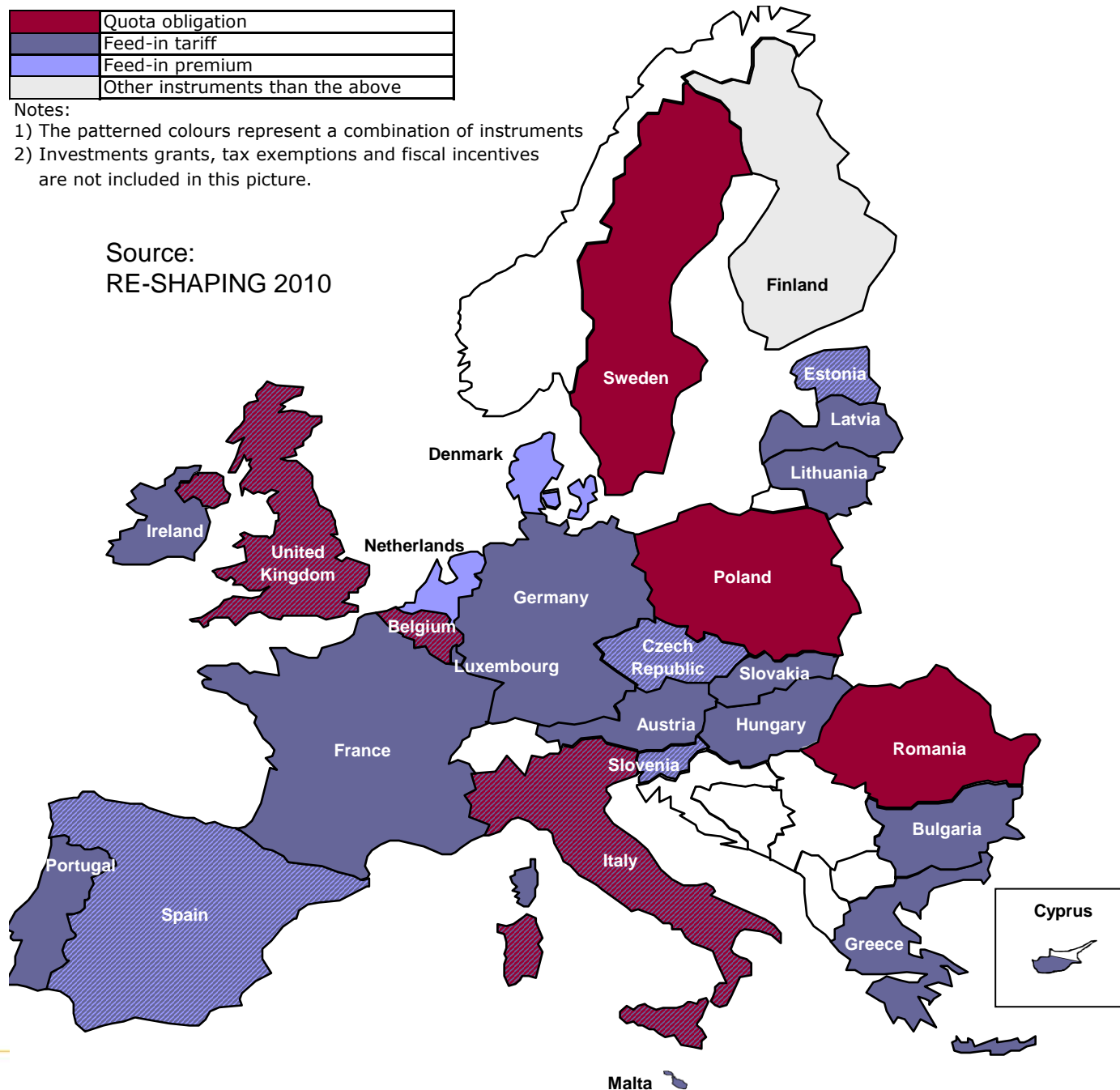
- Obligation for suppliers:
 - Minimum RES-E share
 - Increasing over time
 - Penalty
- Tradable certificates for RES-E production ('market' price)
- Obligation is met by submission of certificates to competent authority
- Power sold on conventional markets

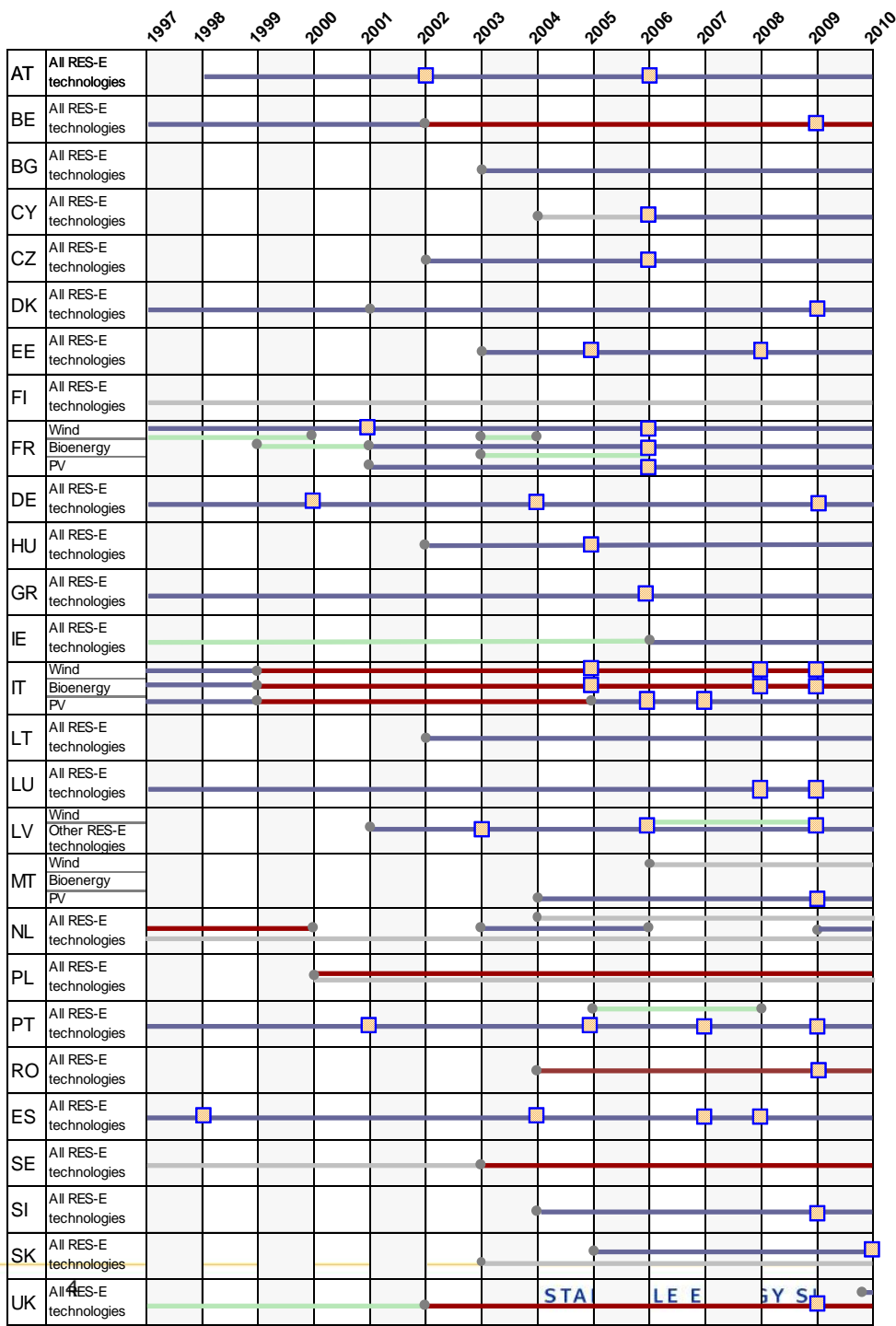
	Quota obligation
	Feed-in tariff
	Feed-in premium
	Other instruments than the above

Notes:

- 1) The patterned colours represent a combination of instruments
- 2) Investments grants, tax exemptions and fiscal incentives are not included in this picture.

Source:
RE-SHAPING 2010

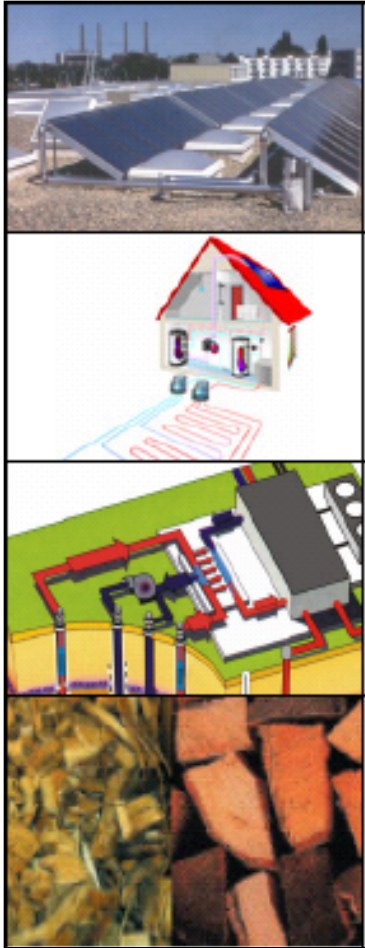




- Feed-in tariff
- Quota / TGC
- Tender
- Tax incentives / Investment grants
- Change of the system
- Adaptation of the system

Main support instrument RES-E & policy changes 1997-2010

Main support policies for RES heat



- Investment grants
- Soft loans
- Tax exemptions and other fiscal incentives
- Use obligations
- Premium tariff

Overview of indicator set

Policy performance indicators

Policy effectiveness indicator
Support level vs generation cost
Profit range (efficiency)

Ex-post evaluation of policy performance

Market status indicators

Deployment status indicator
Electricity market preparedness indicator

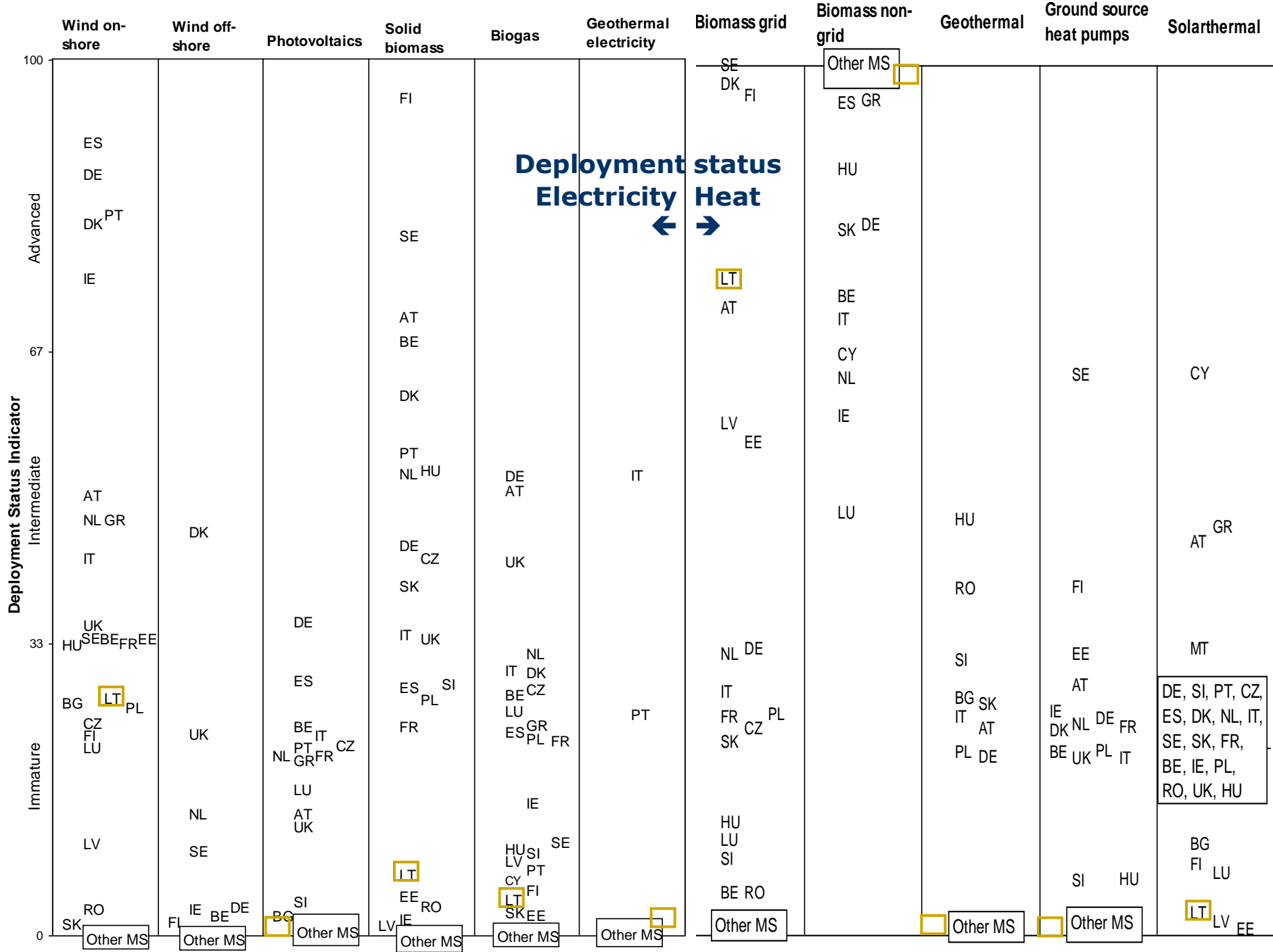
Framework conditions for RE policy (RET market maturity, electricity market)

Used (e.g. by EC) since 2005 and constantly improved, updated, extended.

Deployment Status Indicator

- A rough characterisation of the status of 14 technologies in 27 Member States
- For differentiation in policy performance analysis

Deployment Status Typical characteristics	Three sub-indicators expressing different aspects of RET deployment status		
	<i>Production as % of sector consumption</i>	<i>Production as % of 2030 potential</i>	<i>Installed capacity >100MW</i>
Advanced Established players, fully mature technology, growth may slow down.	Shows relevancy & visibility on energy market		
Intermediate Increasing market, strong growth. Growth related barriers (e.g. infrastructural and supply chain). Some countries stop at this level.	Higher share indicates that low-end barriers have been overcome;	Higher share indicates that low-end barriers have been overcome;	Passing minimum threshold indicates that market players gained trust & experience.
Immature Small market, few players, low growth. Inexperienced administration & banks. Low or unreliable support.	high-end barriers may occur (e.g. integration electricity system)	high-end barriers may occur (e.g. competition resources)	Proof that barriers can be overcome.



Measuring the effectiveness of RES-E support

1. **Relative or absolute growth rates** are typically used to demonstrate the achievements of countries, however both measures are biased
2. Better measure to judge the performance is the **absolute growth as ratio of the additional potential**

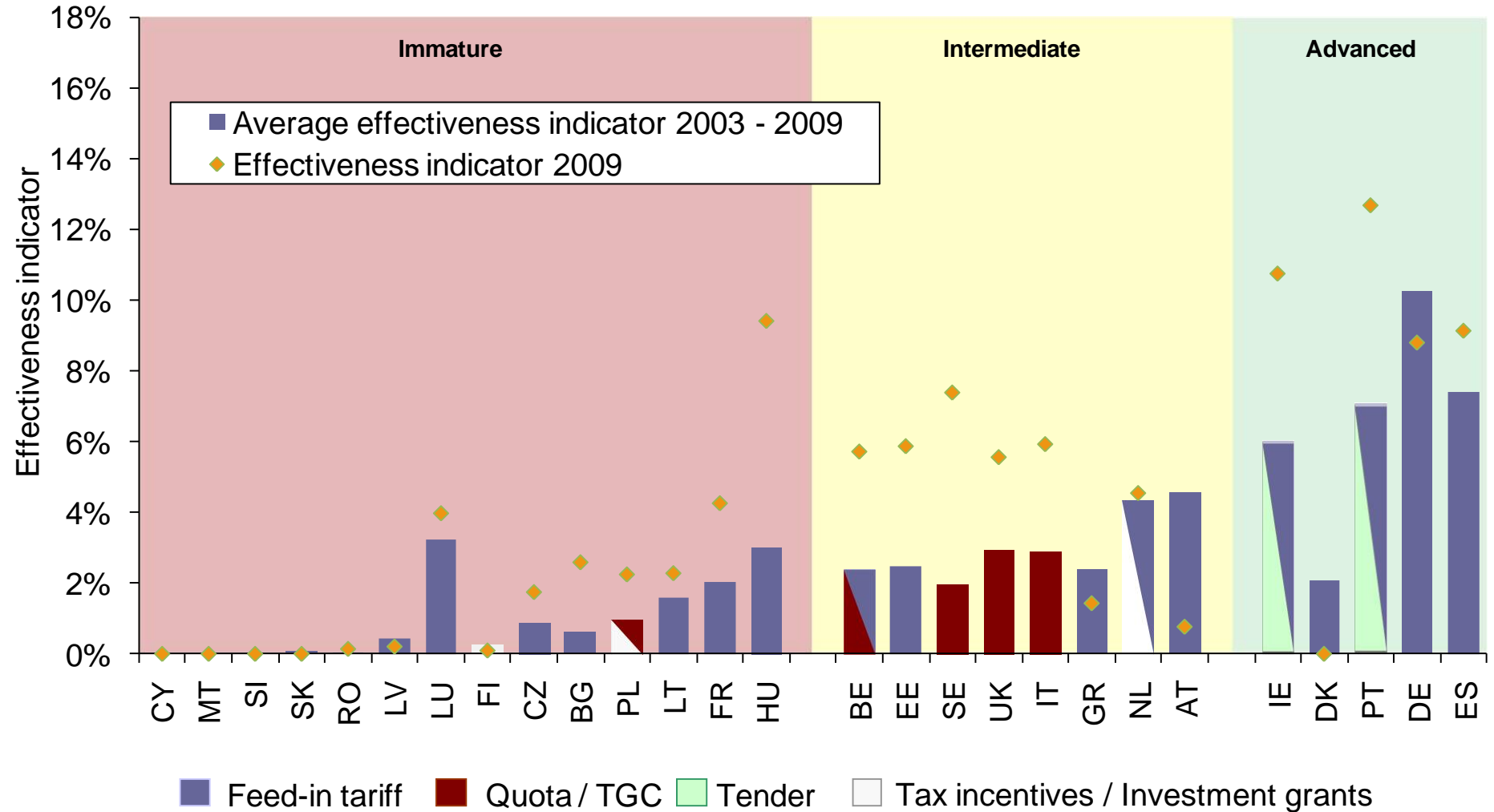
$$E_n^i = \frac{G_n^i - G_{n-1}^i}{ADD - POT_n^i}$$

E_n^i Effectiveness indicator for RES technology i for the year n

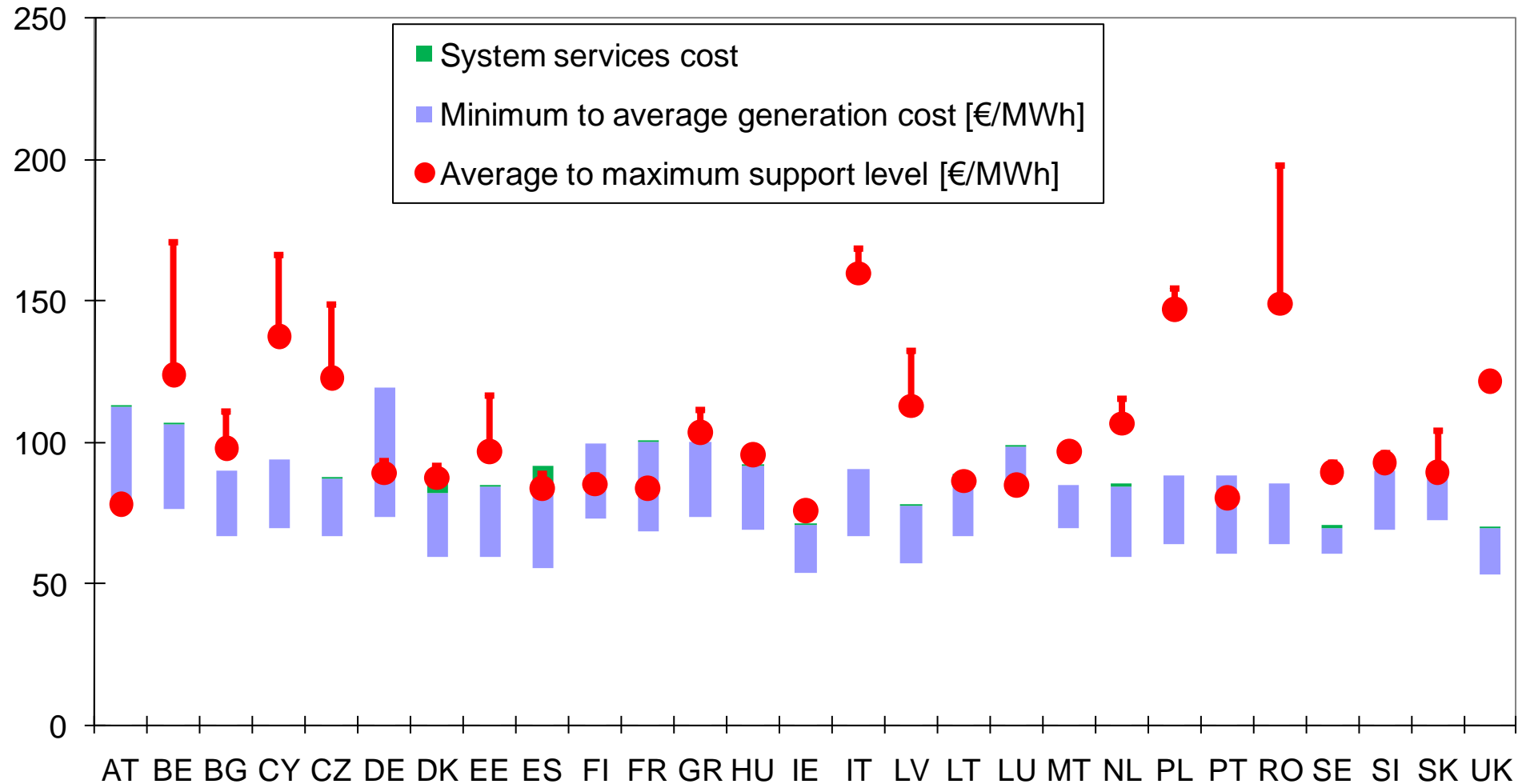
G_n^i Existing electricity generation potential by RES technology i in year n

$ADD - POT_n^i$ Additional generation potential of RES technology i in year n until 2020

Policy effectiveness - wind onshore

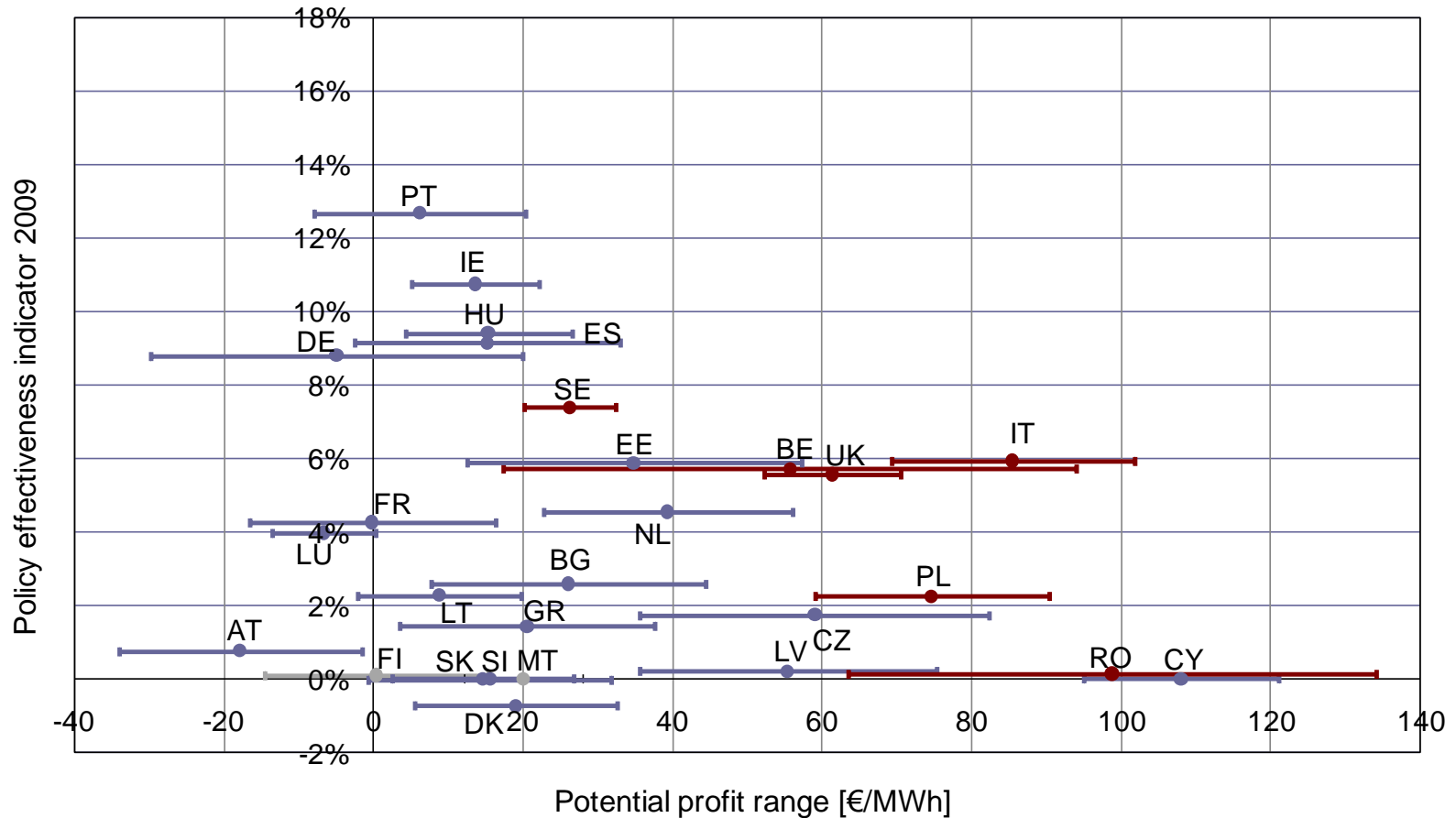


Support level ranges - wind onshore



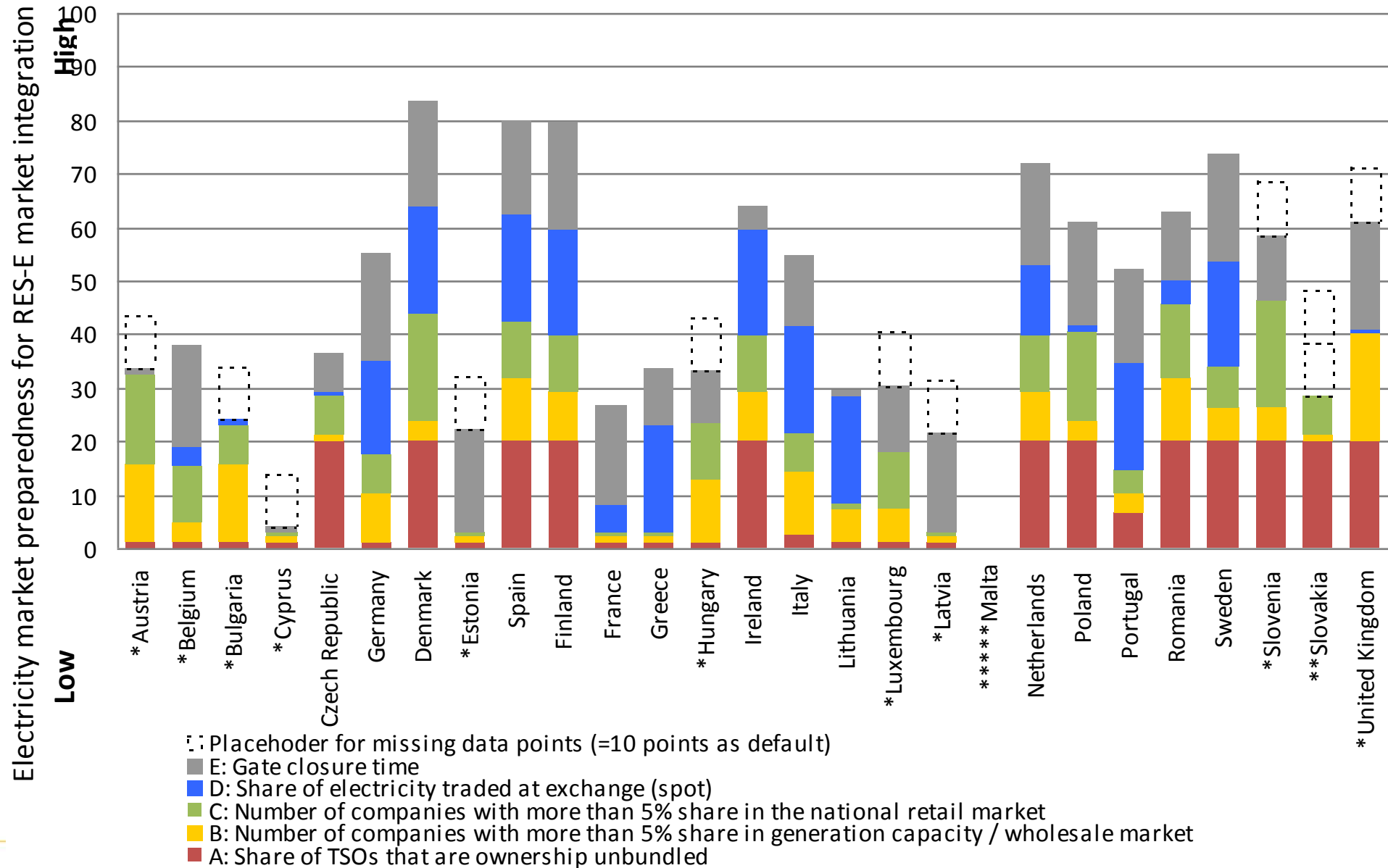
Potential profit ranges - wind onshore

(=cost-effectiveness of policies)



Electricity market preparedness for RES-E market integration

High score necessary but insufficient precondition for successful use of FIP/Quota?



Conclusions - General

1. Policy performance heterogeneous depending on RET/MS
2. Support levels below generation costs -> little/no capacity growth
3. High support levels compared to generation costs do not in all cases lead to substantial capacity growth
 - Enabling growth & support level reduction via reducing barriers, applying best practice support system design and reducing risk -> *Triple-A policy* presentation
4. Markets with higher deployment status tend to grow faster. But: Markets can grow quickly without long track-record.
 - New markets can benefit of established countries' experiences:
 - Adopting best-practice support policy design and administrative processes
 - Spill-over effects from international expertise and supply chain
5. Support levels heat sector provide less profit than in electricity sector
On average, policy effectiveness heat sector lower than in electricity
 - Ensure balance between developing higher cost technologies (progressing on learning curve) and fully utilizing low cost technology potentials (e.g. heat)

Conclusions – Heat sector

- Reconsider whether low profit levels in heat sector need to be increased
- 1. RES-H support usually depends on public budget, resulting stop- and go policies create stronger uncertainty for investors than common in RES-E
 - Apply off-budget policies, e.g. via surcharge on heat (fuel) cost
- 2. AT, DK, FI, LT, SE effectively promoted biomass-based centralised heating. Success factors: Existing district heating networks in Northern Europe, biomass availability, sufficient heat demand
- 3. Support for decentralised biomass heat plants > centralised plants
- 4. BE, CZ, DE, RO most effectively supported decentralised biomass heating
- 5. Policy effectiveness solar thermal heat rather low (also due to a high remaining resource potential) - AT, GR, CY leading countries
- 6. Ground-source heat pumps effectively promoted by using obligations in SE and investment grants and fiscal incentives HU & FI
- 7. Long reinvestment cycles limit the diffusion rate for the integration of renewable heating systems that are integrated in buildings
 - Consider supporting already now those technologies that are likely needed in the future energy system - beneficial for system integration of fluctuating RES-E (heat pumps or biomass CHP with heat storage)

Conclusions – Electricity sector 1/2

1. Most effectively supporting wind onshore: IE, PT, ES, DE
2. Wind offshore just starting in UK, IE, DK, DE
3. Most effectively supporting PV: DE, CZ, IT
4. Most effectively supporting biogas: AT, DE, UK
5. Most effectively supporting biomass: BE, SE, NL, DK, AT, HU, DE and CZ
6. Best FIT-countries show highest effectiveness. Best quota countries improved performance in particular for low cost RET (e.g. wind onshore in UK, IT, BE, SE in 2009). Note risk reduction in UK quota system (->FIP)
7. In most quota systems support levels are insufficient for higher cost technologies such as PV.
 - Separate incentives in many quota countries: BE minimum prices for PV, IT FIP for PV, UK FIT for small-scale applications. Technology-banding within the quota as applied in UK can help to support cost-intensive technologies like wind offshore, but is less suitable for small-scale projects than feed-in tariffs.

Conclusions – Electricity sector 2/2

- Differentiate support instruments according to
 - technology maturity (mature wind onshore vs immature wind offshore)
 - project size (kW-range vs several hundred MW)
 - type of envisaged investor (utilities, new independent power producers, small-scale business, households or farmers)
 - Type of lender
- Stimulated capacity growth may develop faster than envisaged causing high policy costs (PV). Stop-and-go policies harm industry as a whole.
 - FIT/FIP for RET with rapid cost reduction require frequent tariff adjustment cycles (for new projects only!) and good coordination of tariff levels with other relevant markets.
 - EC MS information exchange on support levels may help MS to determine support levels in such a way that they suit their deployment target.

Thank you for your attention!

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2010 indicator report available on

www.reshaping-res-policy.eu

2011 indicator report available as of early summer