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Renewable Energy policies in the EU Member States

Indicators assessing market status, policy effectiveness & efficiency

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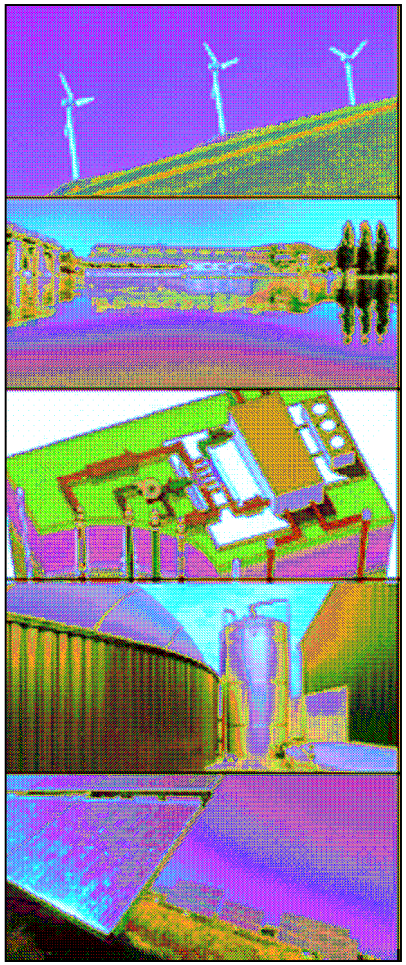
Main support policies for RES electricity



- 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

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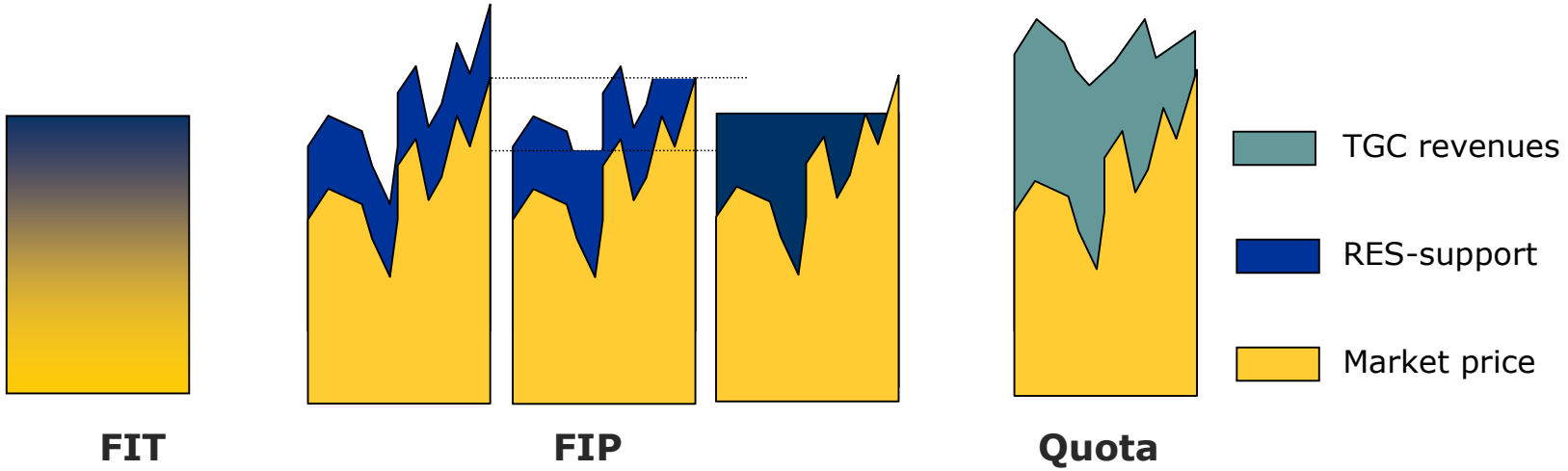
Key features FIT, FIP & Quota



fixed premium - cap & floor - sliding/Cfd

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

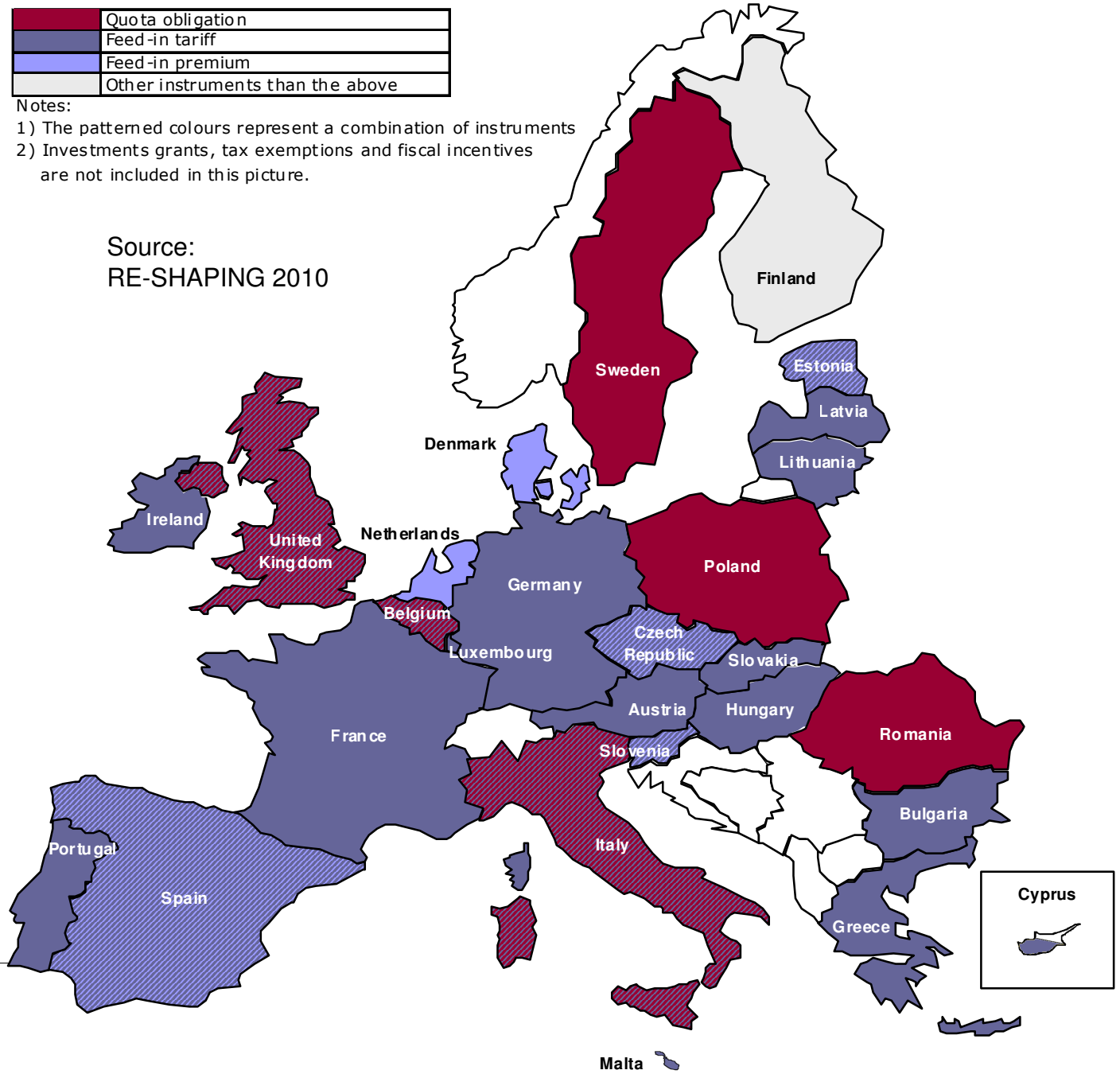
- Obligation for suppliers:
  - Minimum RES-E share
  - Increasing over time
  - Penalty
- Tradable certificates for RES-E production ('market' price)
- Obligation is met by submission of certificates to competent authority
- Power sold on conventional markets

Main RES-E support instruments in the EU-27

	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



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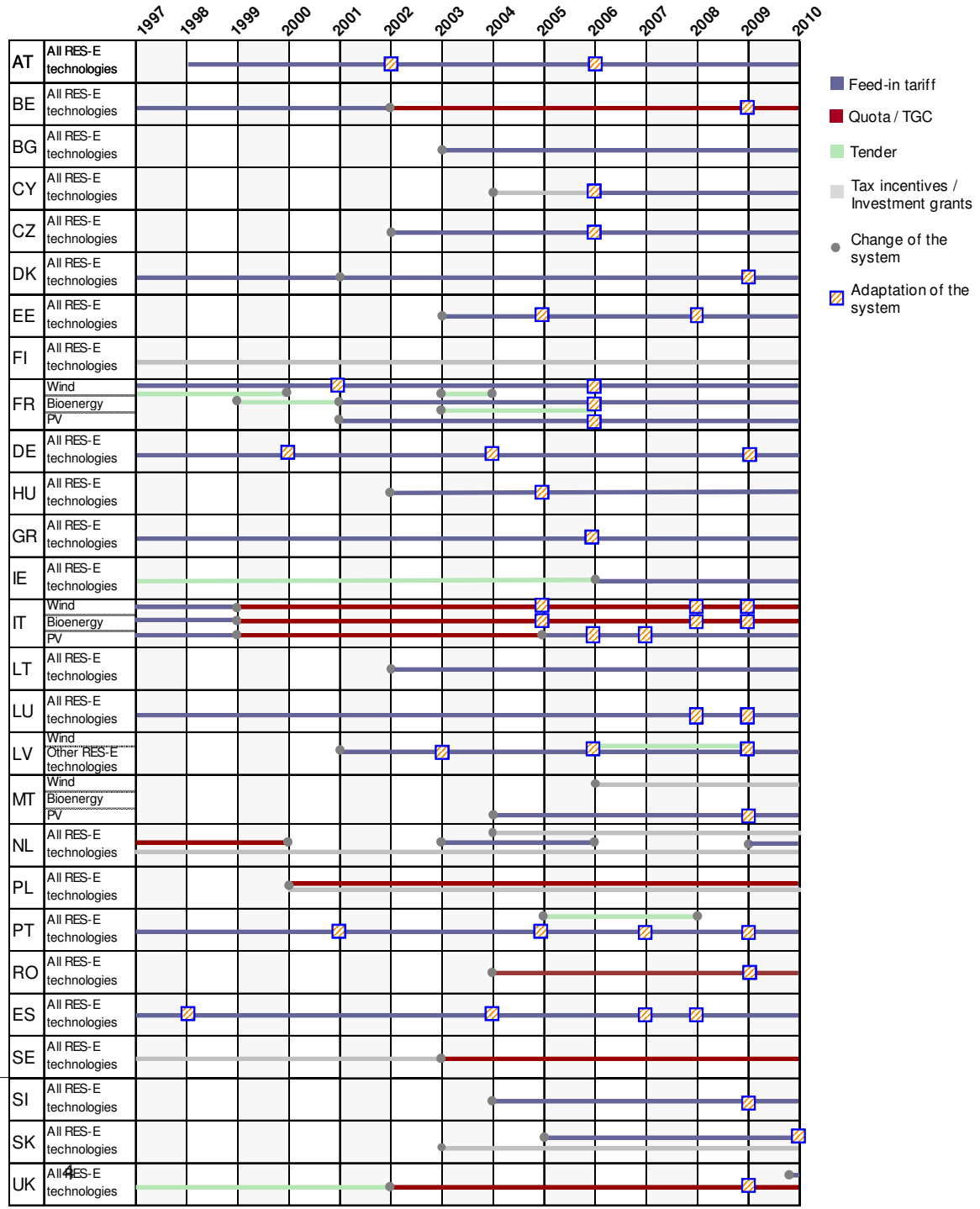

Main support instrument RES-E & policy changes 1997-2010

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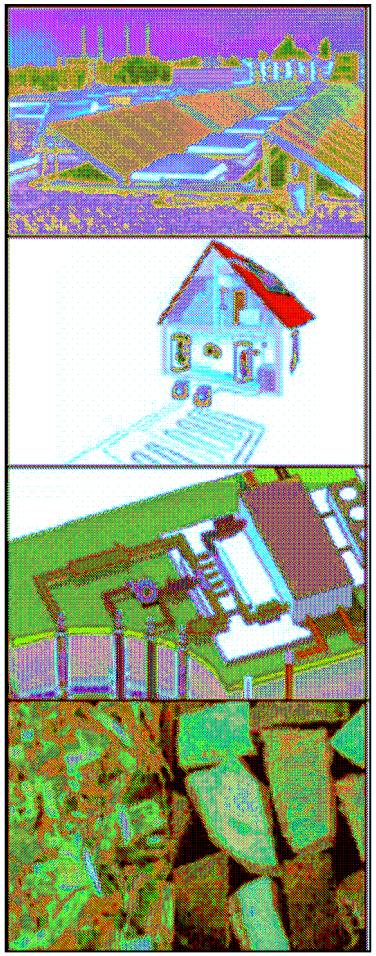
Main support policies for RES heat



- Investment grants
- Tax exemptions and other fiscal incentives
- Use obligations

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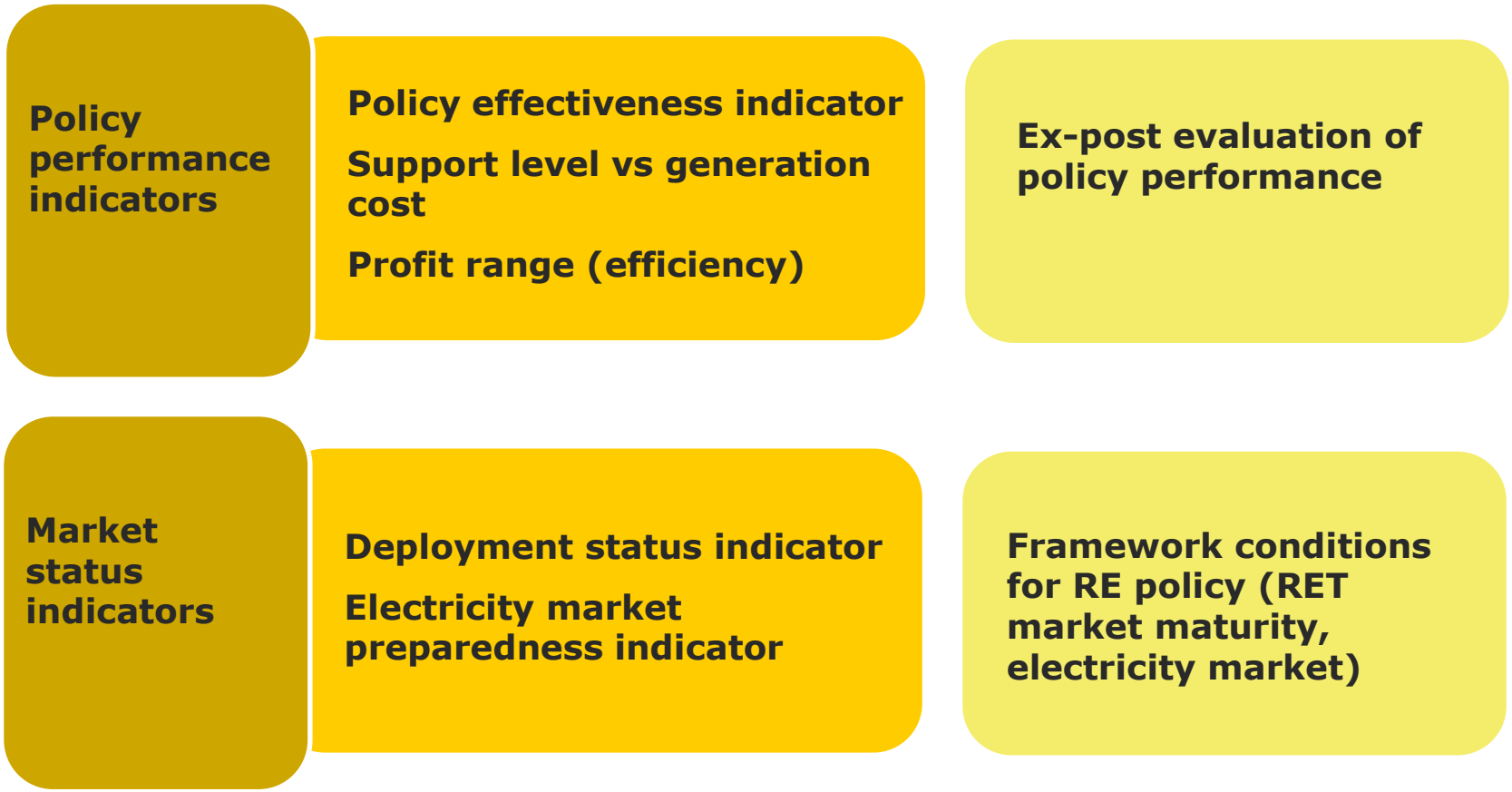
Overview of indicator set



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

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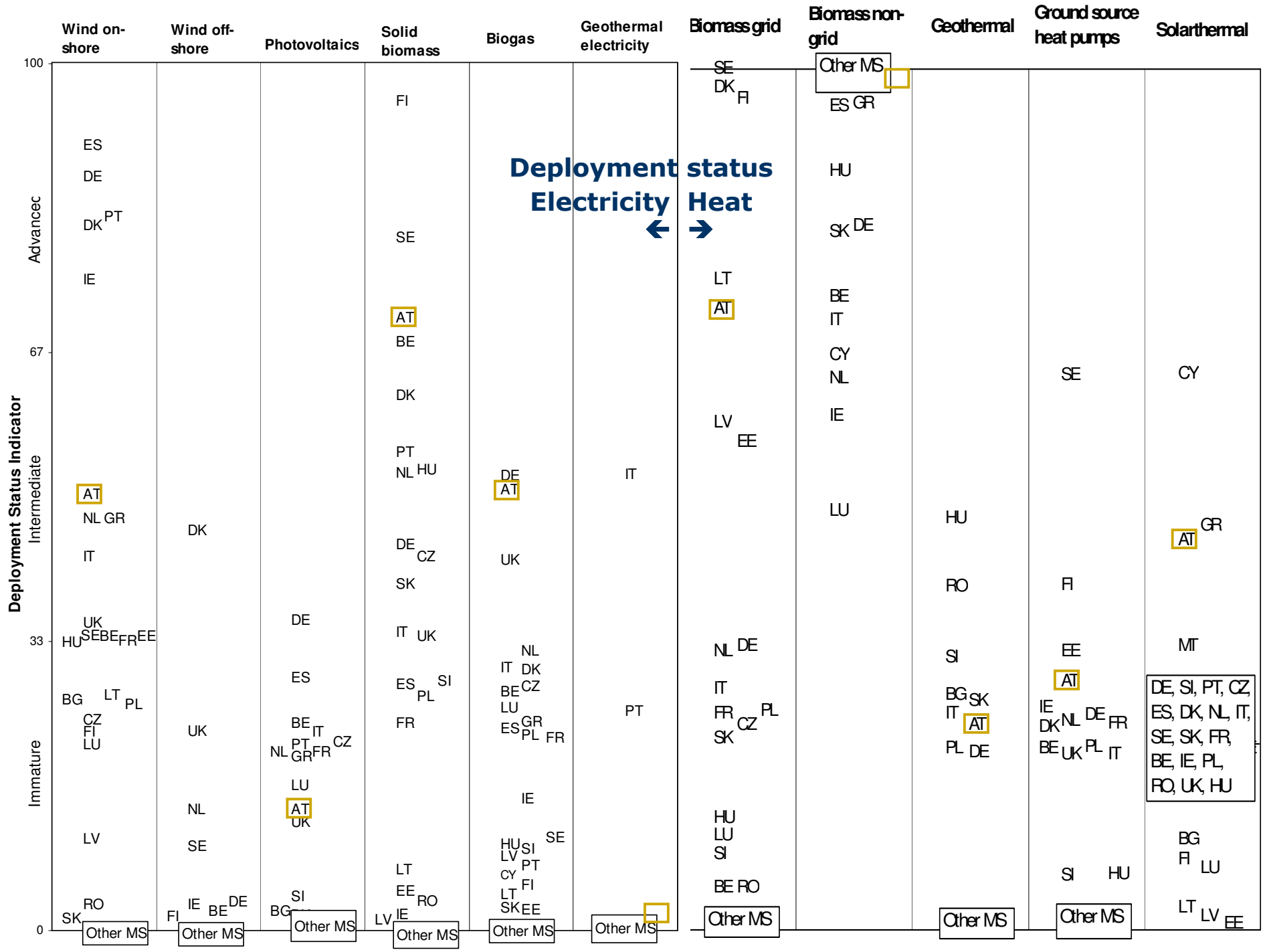
Deployment Status Indicator

- **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		
	Production as % of sector consumption	***Production as % of 2030 potential***	***Installed capacity >100MW***
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; high-end barriers may occur (e.g. integration electricity system)	Higher share indicates that low-end barriers have been overcome; high-end barriers may occur (e.g. competition resources)	Passing minimum threshold indicates that market players gained trust & experience. Proof that barriers can be overcome.
Immature Small market, few players, low growth. Inexperienced administration & banks. Low or unreliable support.			



Not shown is hydro (Deployment Status in most MS advanced), solarthermal electricity and tide & wave (in 2008 Deployment Status in all MS still close to zero).

Solid biomass is a very heterogeneous category as it comprises different technologies (pure biomass plants and

case of biomass non-grid this applies to UK and MT.

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

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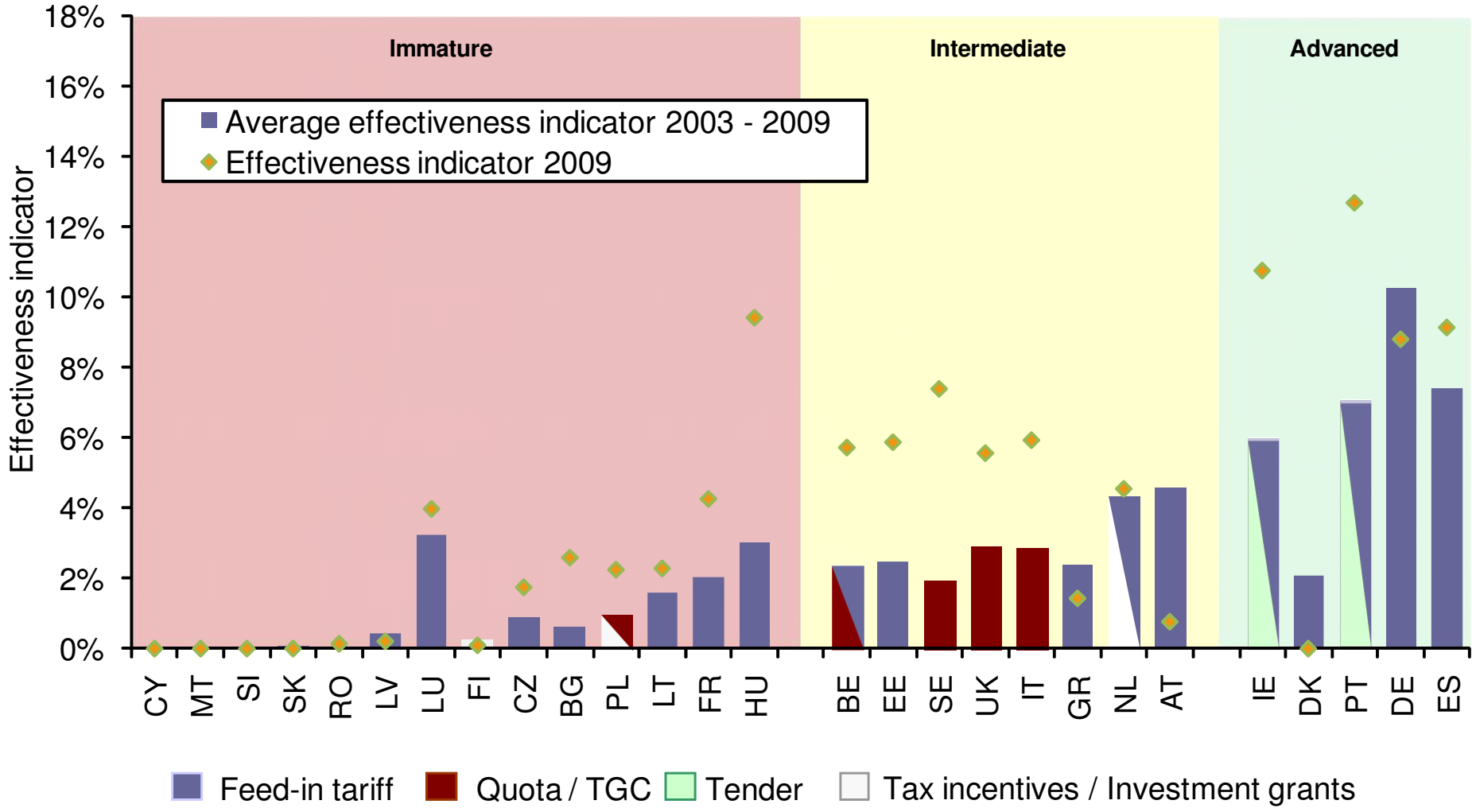
Policy effectiveness - wind onshore



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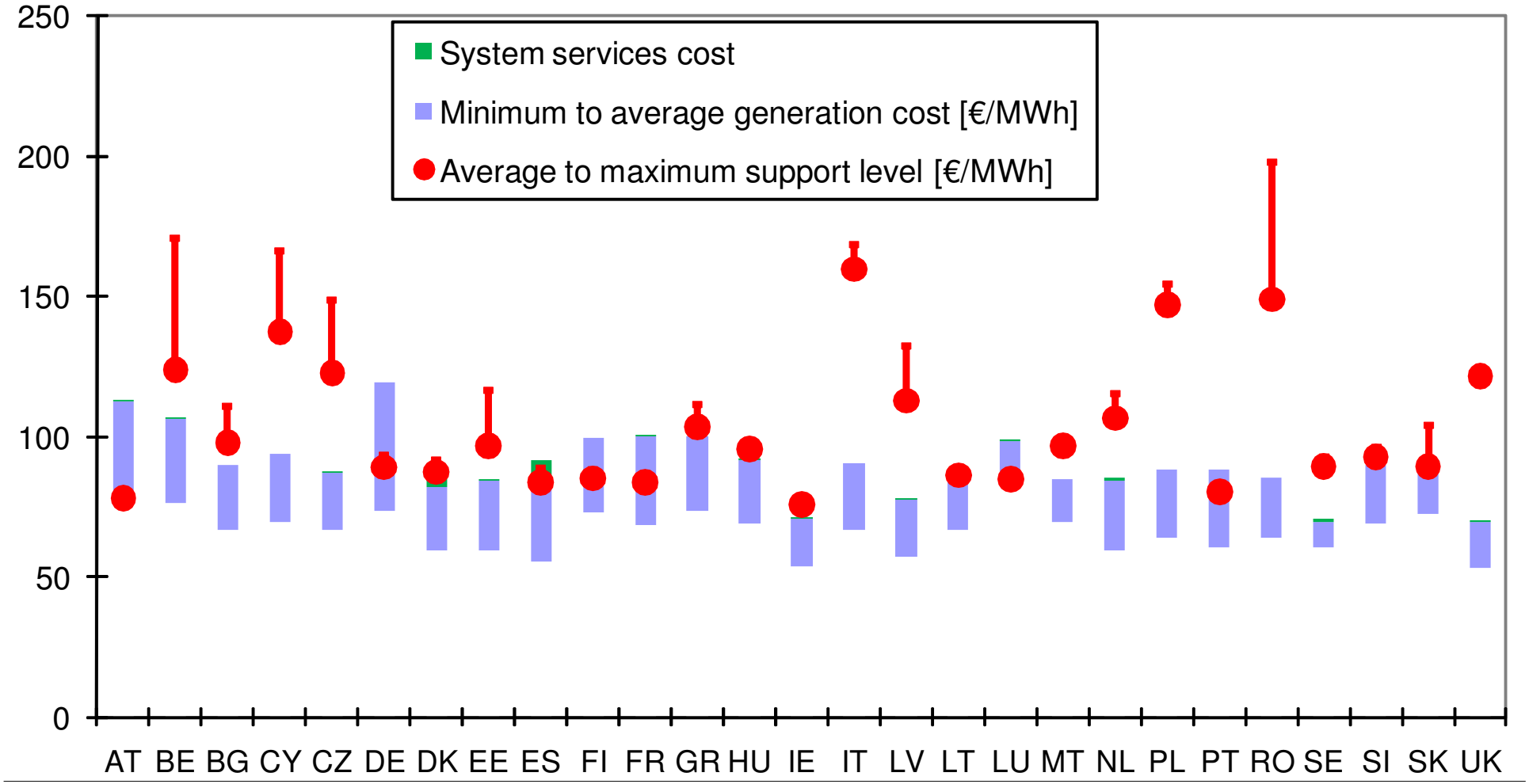
Support level ranges - wind onshore



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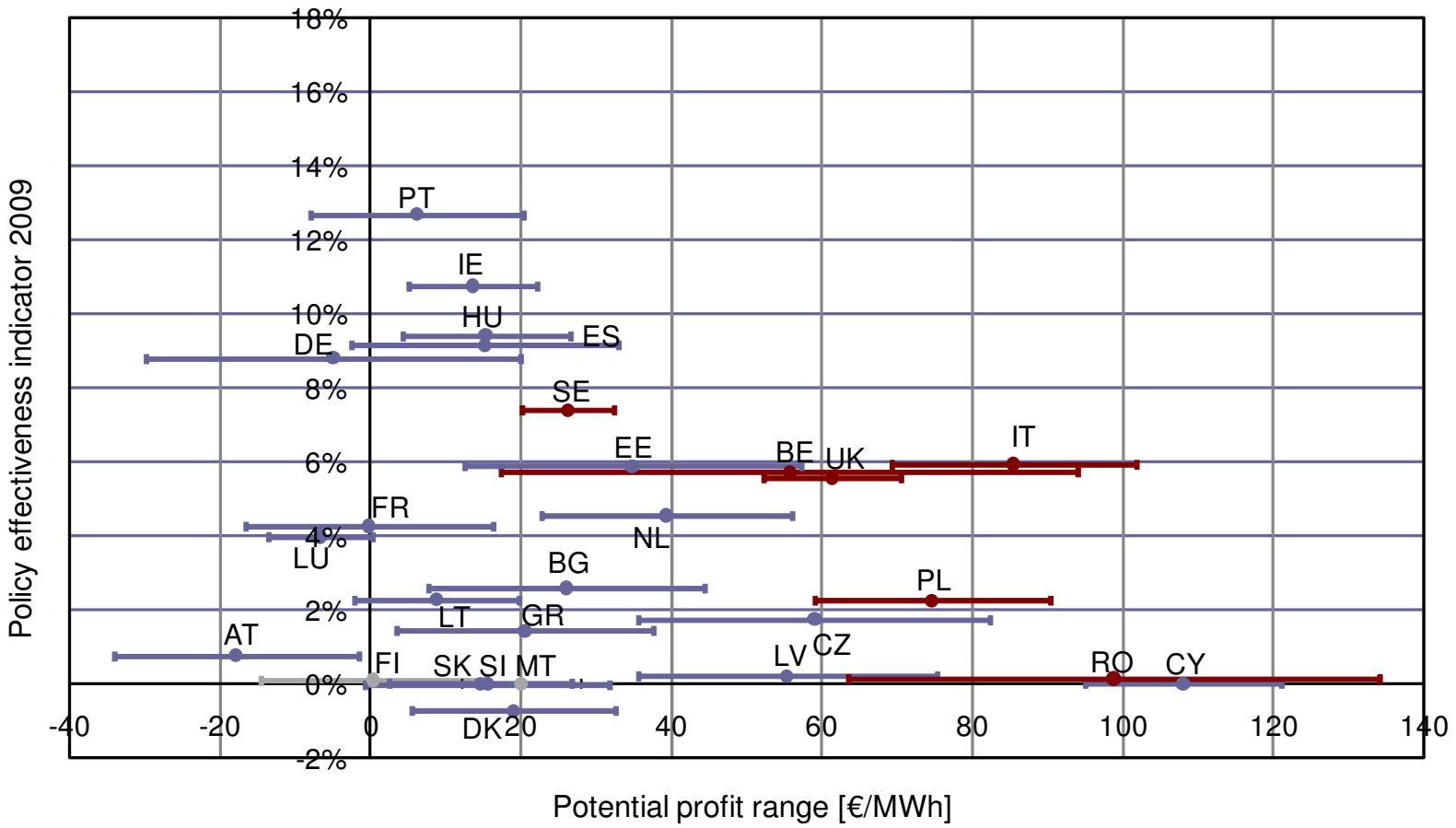
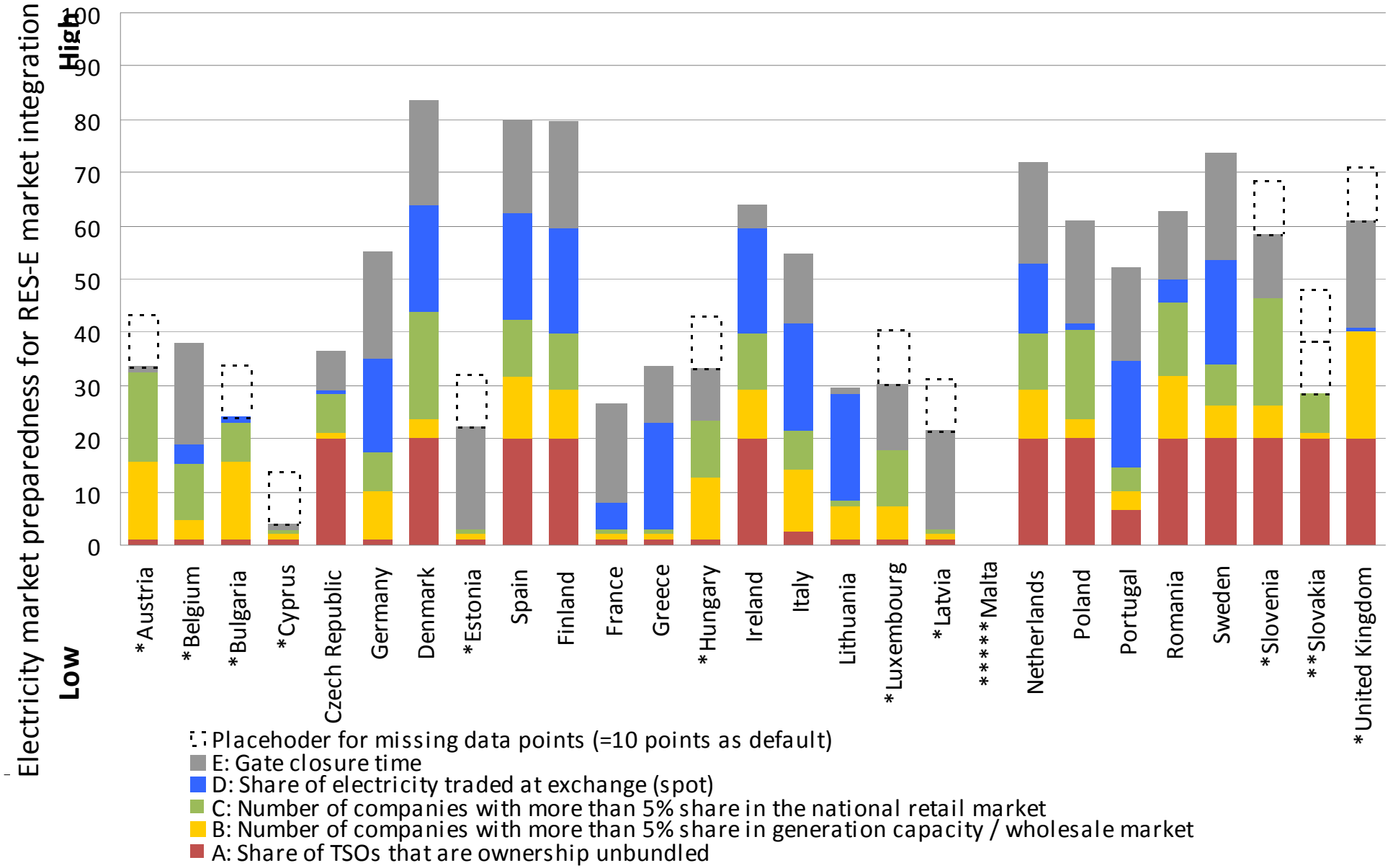
Potential profit ranges - wind onshore
(=cost-effectiveness of policies)



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 is rather heterogeneous depending on RET/MS
2. If support levels are below generation costs, little or no capacity growth can be observed
3. High support levels compared to generation costs do not in all cases lead to substantial capacity growth
   - ➔ Growth can be allowed & support levels reduced by reducing barriers, applying best practice support system design and reducing risk -> *Triple-A policy* presentation
4. Markets with a higher deployment status tend to grow faster. However, examples show that markets can grow quickly without having a long track-record.
   - ➔ Countries with low deployment status can benefit of other countries' experiences. Policy effectiveness can be rapidly increased by adopting best-practice support policy design and organisation of administrative processes. Can profit from spill-over effects from internationally available project development expertise and supply chain.
5. Support levels heat sector provide less profit than in electricity sector, despite the low generation costs of many RES-H technologies. On average, policy effectiveness in the heat sector is also lower than in the electricity sector.
   - ➔ Ensure balance between developing higher cost technologies (progressing on learning curve) and fully utilizing low cost technology potentials (e.g. heat).

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Conclusions – Heat sector

➔ Reconsider whether observed 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, LV, 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 heating plants is on a higher level than that of 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
   ➔ Due to long reinvestment cycles it might be useful to already start now supporting especially those technologies that are likely needed in the future energy system. This might refer especially to technologies that are beneficial for system integration of fluctuating RES-E, like heat pumps or biomass CHP with heat storage.

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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. BE, SE, NL, DK, AT, HU, DE and CZ show high policy effectiveness in Biomass
6. FIT-countries still show highest effectiveness but quota countries are catching up in particular with regard to low cost RET (e.g. wind onshore in UK, IT, BE, SE in 2009). In the same period e.g. in the UK quota system certificate revenue risk has been reduced substantially – from an investment risk perspective the system is close to a less risky FIP.
7. Remuneration in FIT tends to be lower (higher) for low (high) cost technologies than under a quota. In most quota systems support levels are insufficient for high cost technologies such as PV.

   ➔ Many quota countries offer separate incentives: 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.

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Conclusions – Electricity sector 2/2

- ➔ Differentiate support instruments according to technology maturity (e.g. rather mature wind onshore or rather immature wind offshore), project size (rather kW-range, few MW, or several hundred MW), type of envisaged investor (utilities, new independent power producers, small-scale business, households or farmers), or lender.

1. Stimulated capacity growth may develop faster than envisaged causing high policy costs. Stop-and-go policies harm industry as a whole.
   - ➔ FIT/FIP for RET with rapid cost reduction require frequent tariff adjustment cycles and good coordination of tariff levels with other relevant markets. (Frequent) tariff adjustments based on (automatic) adjustment formulae (related to market growth) at dates known to the market sufficiently long beforehand can manage this policy cost risk without negatively affecting the investment climate

- ➔ EC could oblige MS to be more transparent in their RES-support. E.g. putting information on (the assumptions for calculating) average support and profit levels directly from the MS governments on a transparency platform. This should help MS to determine (technology-specific) support levels in such a way that they suit their (technology-specific) deployment target.

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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