MARKET READINESS FOR RENEWABLES IN EUROPE

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Assessment of the conditions for RE diffusion: The RE Framework Indicator - REFI

Main objectives:

- ✓ Monitoring drivers and barriers framing the diffusion of RE technologies in the EU MS
- ✓ Systemic assessment of boundary conditions including non-economic parameters
- ✓ Identification of gaps in the regulatory framework
- ✓ Encourage diffusion of best practices across EU Member States

Scope:

- Annual bottom-up assessment across all 28 EU MS
- Focus on wind onshore and PV
- 30 individual indicators grouped in 4 categories and 16 sub-categories
- Aggregation to one composite indicator (REFI)

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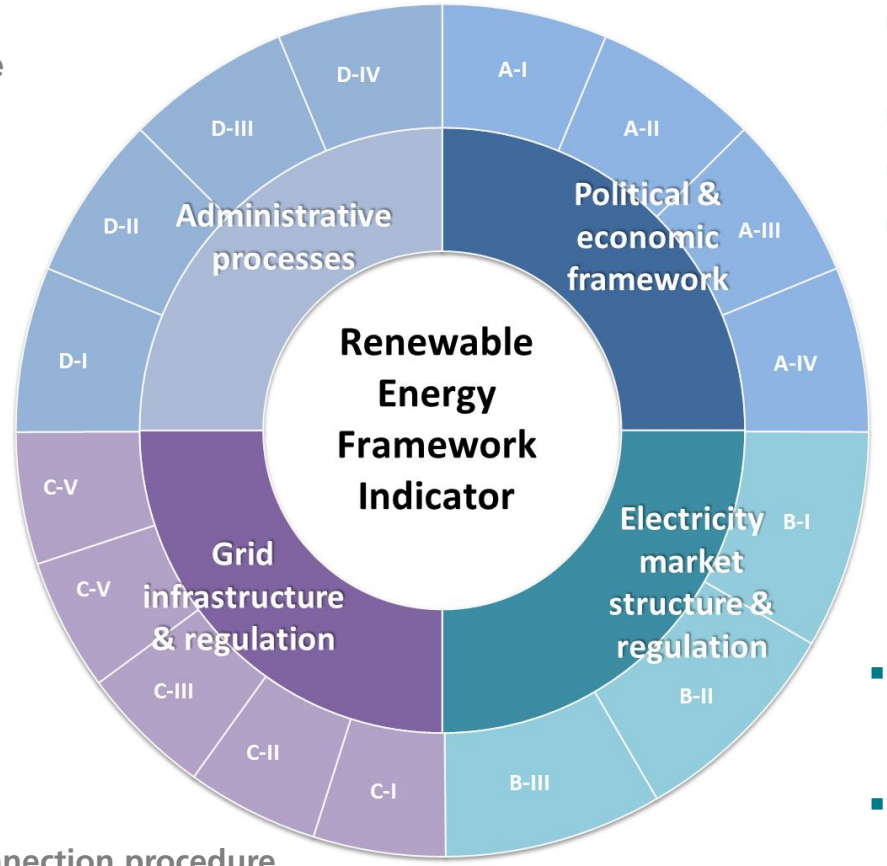
Structure of the RE framework indicator

- Administrative cost
- Administrative lead time
- Complexity of administrative procedures
- Integration of RES-E in spatial & environmental planning



- RES-E strategy and support scheme
- Remuneration level
- Revenue risk
- Access to finance

- Cost of grid access
- Grid access lead time
- Transparency of grid connection procedure
- Treatment of RES-E dispatch (curtailment)
- Transparency & predictability of grid development

- Fair and independent regulation of electricity sector
- Existence of short-term markets (liquidity and gate closure of ID-markets)
- Availability of long-term PPA's for RES-E

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Method of calculation

To construct the overall indicator score:

1. Each of the 30 indicator values is normalized (numeric value 0-1).
2. The indicator values for each of the 16 sub-categories are aggregated (averaged).
3. Each sub-category value is weighted according to its relevance for the RE diffusion process.
4. The applied weighting factors are empirically-based values generated through a large-scale survey among RE-experts.
5. The overall indicator value is obtained by multiplying the weighted sub-category values (multiplicative aggregation).

Calculation formula

$$CI = D_1^{w_1} \cdot D_2^{w_2} \cdot D_3^{w_3} \cdot \ldots \cdot D_{16}^{w_{16}}$$

Where:

CI = Composite Indicator score

D_{1-16} = *Score of determinant 1-16*

w_{1-16} = *Weight of determinant 1-16*

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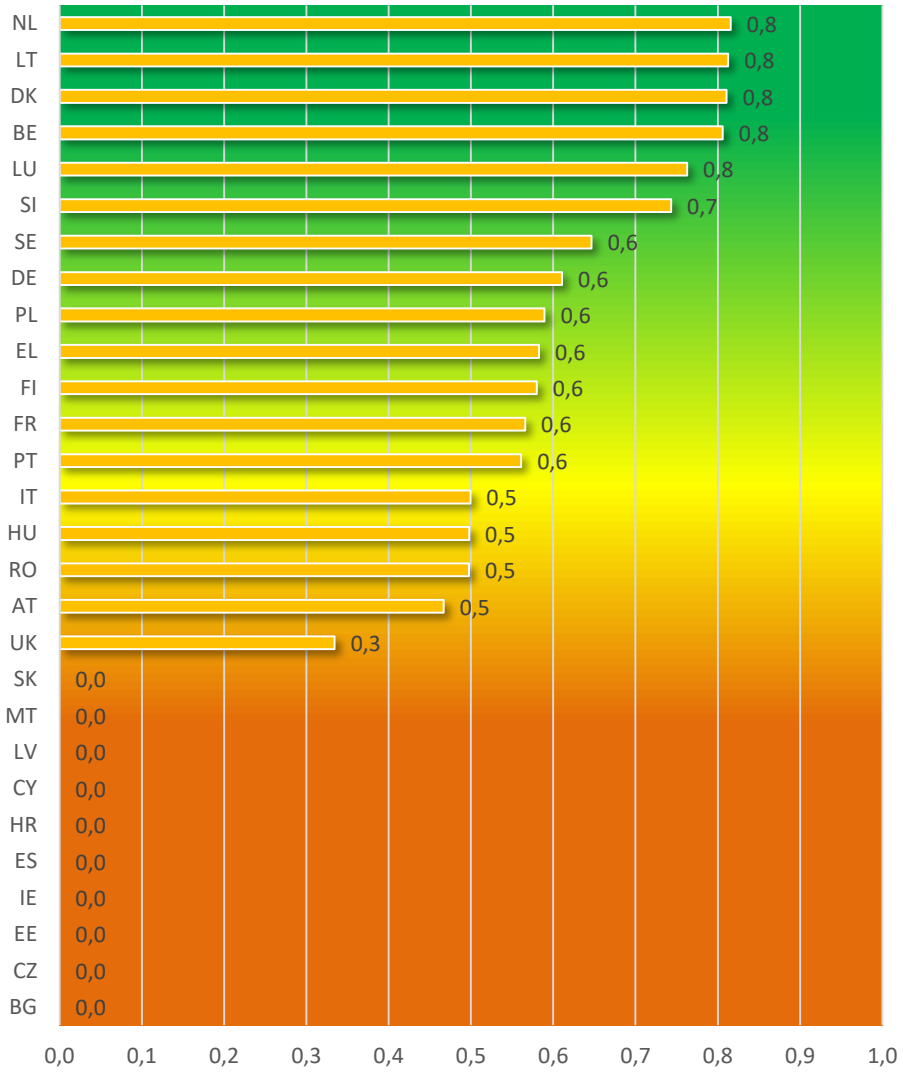
PV - Results RE Framework Indicator 2016



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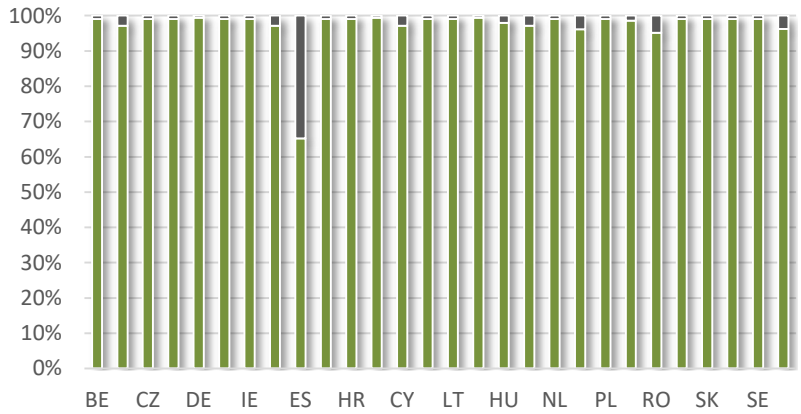
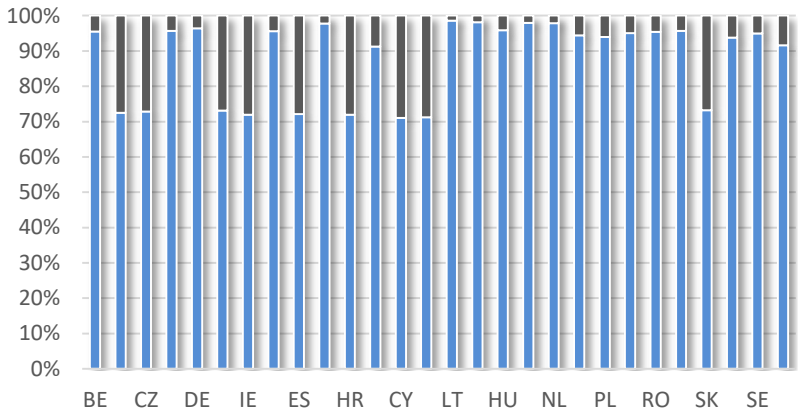
PV - Indicator scores per category

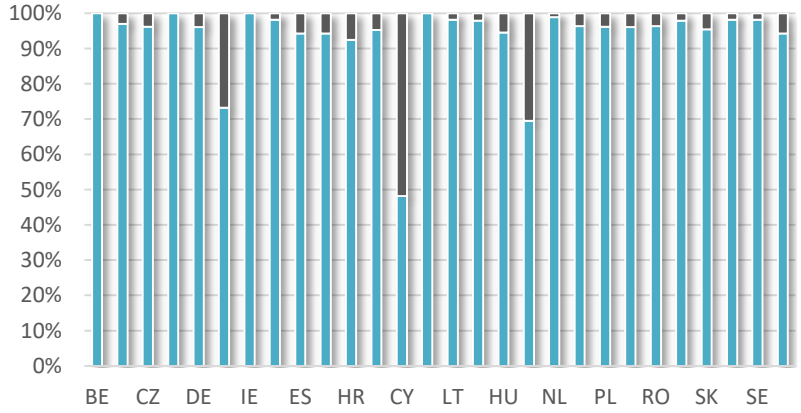
Electricity market structure



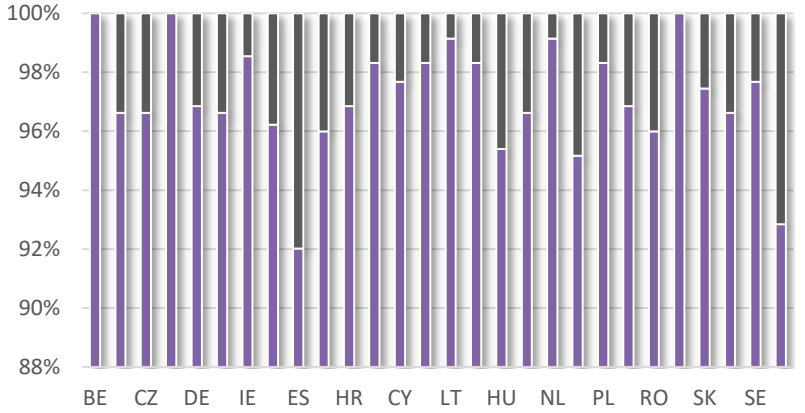
Political and economic framework



Administrative processes and planning



Grid infrastructure and grid regulation



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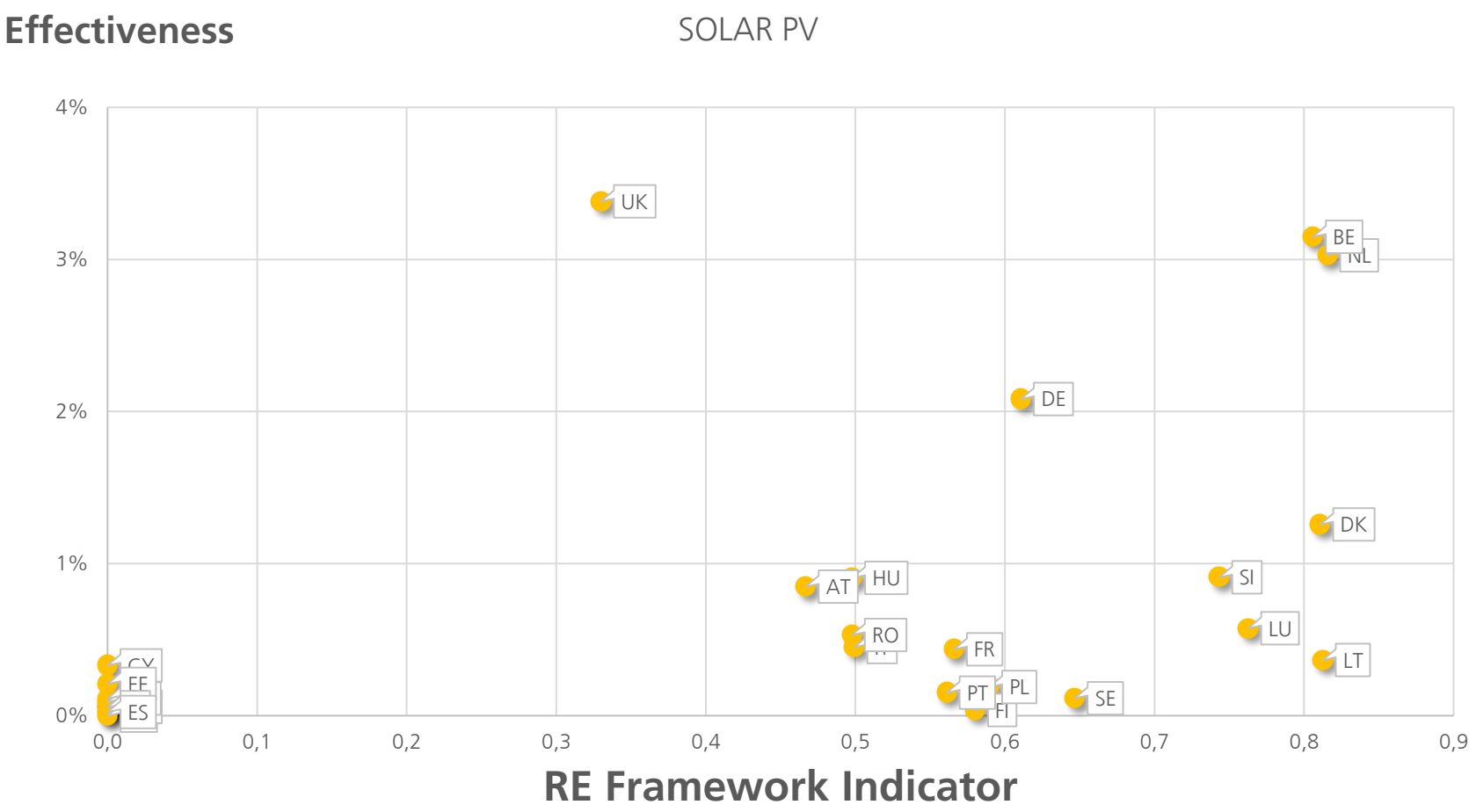
Effectiveness of market deployment vs. RE Framework Indicator for PV



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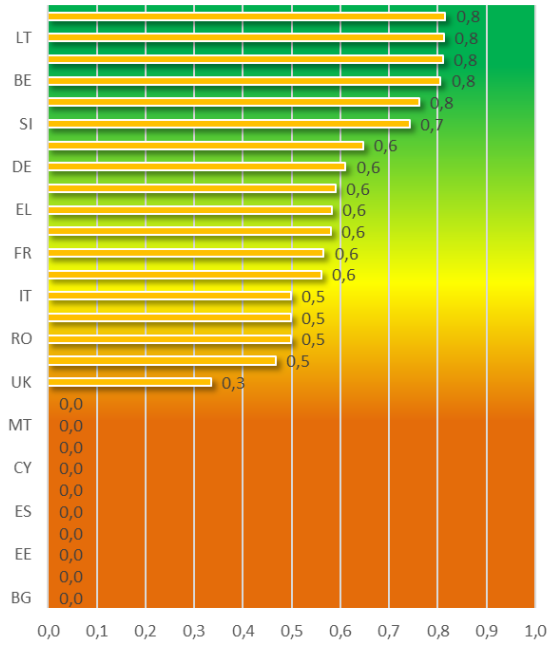
Resume and Conclusions I



- In 2016 in10 EU MS, individual framework factors were identified that have the potential to block wind or PV deployment completely
- Only 6 MS show particularly favourable framework conditions (REFI >0.6) for both PV deployment
- Findings are affirmed by a low effective RE market growth observable in 2016 in several EU MS
- The results present still a draft status to be further refined
- Correlations between REFI and Effectiveness should be interpreted with care because of time delays between investment decision and start of operation

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Resume and Conclusions II

- Political and economic framework:
  - Significant gaps exist in several MS
  - The remuneration levels are insufficient to incite RE deployment in various countries
- Market barriers mainly regarding the access to and liquidity of ID-markets
- Grid access for RE:
  - Insufficient framework in many MS (long and complex procedures and high cost)
  - Lack of transparency of grid development plans
  - Diffusion of best practices (i.e. shallow charging approaches and standardized connection procedures) is necessary
- Administrative processes are still a relevant barrier in some MS:
  - Complexity and duration of permitting procedures problematic in several MS
  - Also spatial planning for RE needs to be enhanced in order to reduce risks for develeopers

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Thank you for your attention!

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