

# Policy criteria and possible policy pathways for harmonization

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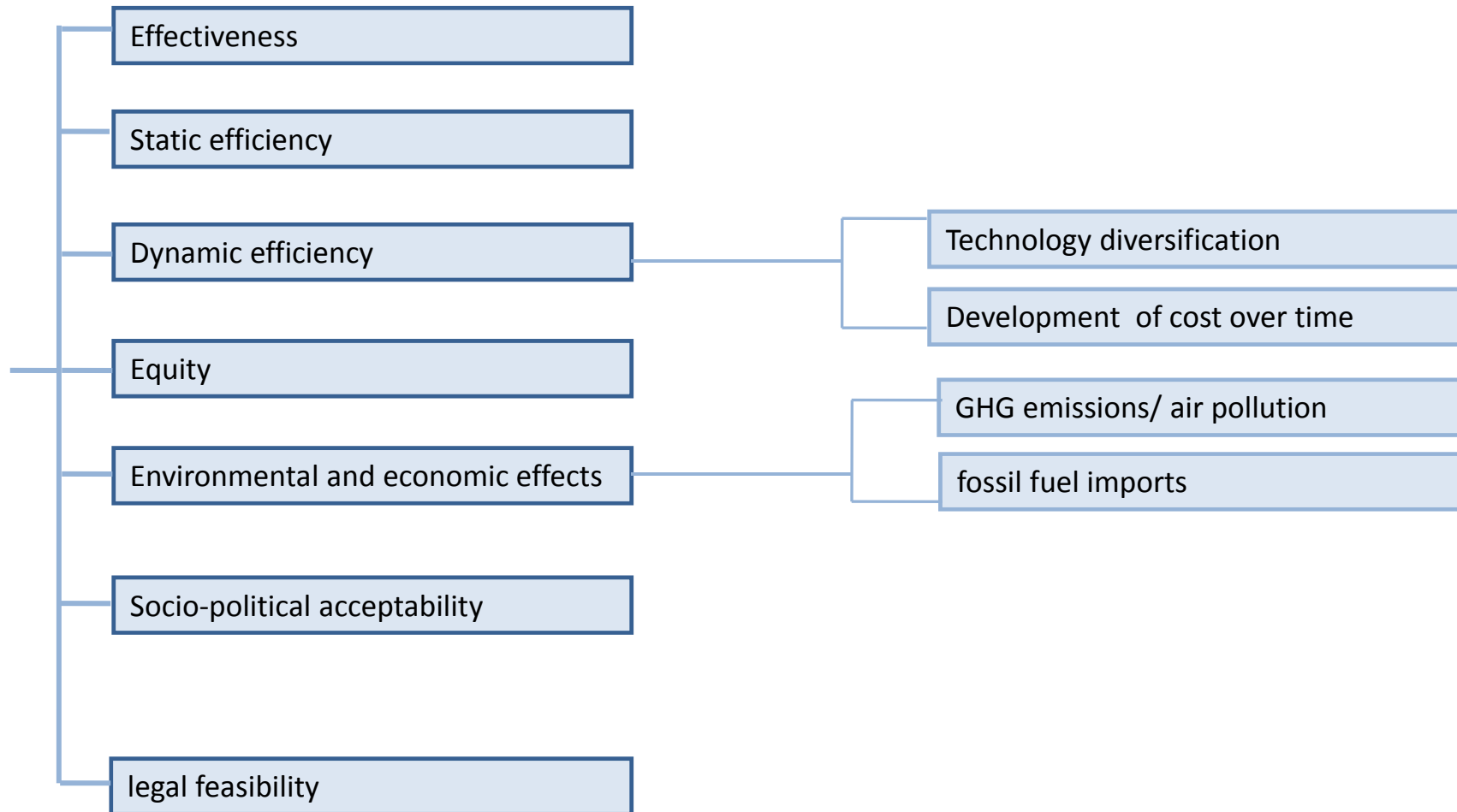
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# CRITERIA

- Theoretical background and methodology.
  - Environmental economics
  - Innovation studies.
  - Learning effects.
  - Political science.
  - Empirical literature on RES-E policy support schemes
  - Literature on EU harmonisation of RES-E support schemes.
  - Commission documents.
  - Guidelines in existing policy documents

# Assessment Criteria



# Effectiveness

- Ability of a policy pathway to trigger deployment. Does this pathway enable EU Member States to achieve the RES(-E) target?
- Relevant data provided by Green-X modelling

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

$E_n^i$  Effectiveness Indicator for RES technology  $i$  for the year  $n$

$G_n^i$  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

**Indicator:**

Degree of target achievement

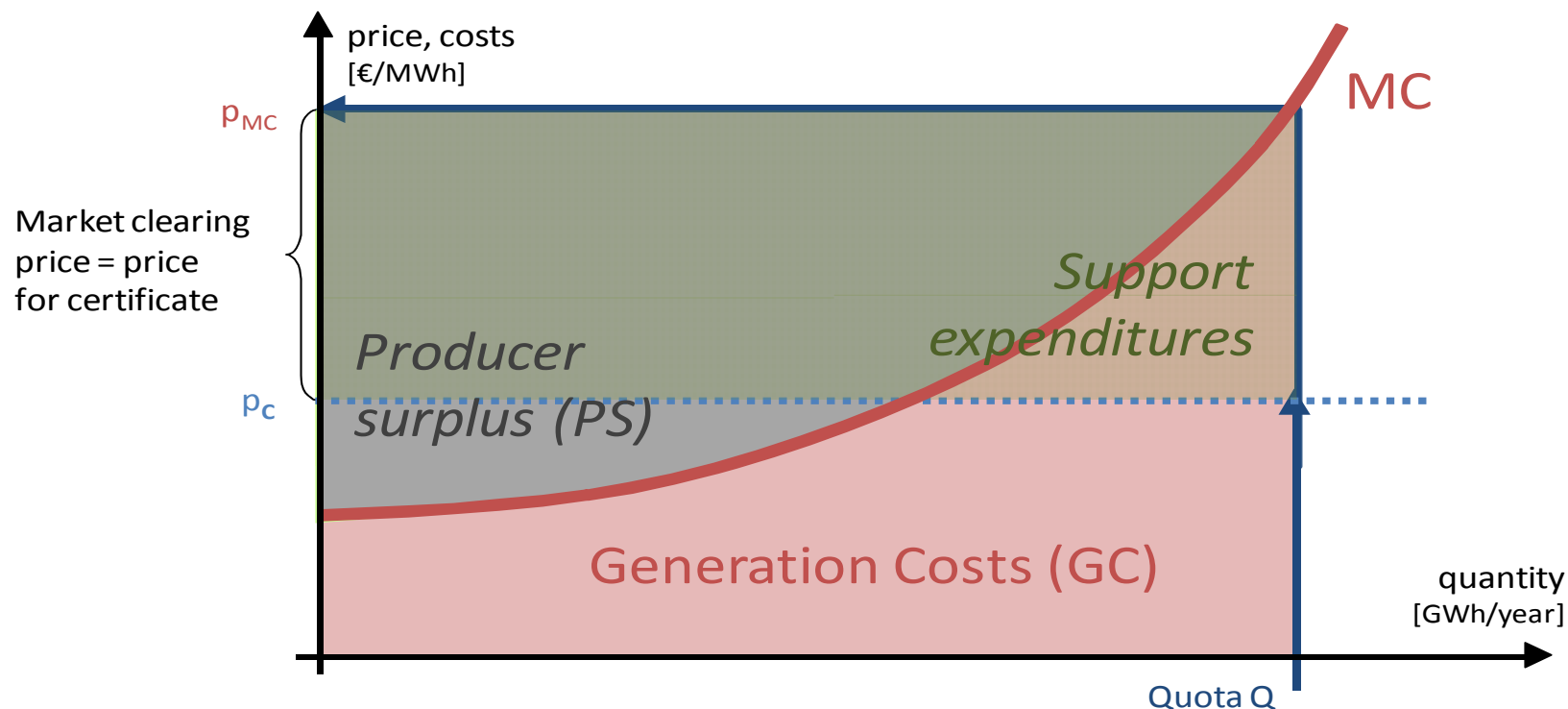
## Static efficiency (cost-effectiveness)

- Achievement of a given short-run RES-E target at the lowest possible cost to society
- Equimarginality Principle: Cost-effectiveness is attained when an instrument encourages proportionally greater RES-E deployment by those firms and installations with lower RES-E deployment costs, and lower RES-E deployment by firms with higher deployment costs.
- Relevant data provided by Green-X modelling

**Indicator:**

Support expenditures [bn €] – average annual expenditures between 2021-2030

Alternative measurement: Generation cost of RES



**Support expenditures**  
(transfer costs for consumer/ society)  $= PS + GC - p_c * Q = ( p_{MC} - p_c ) * Q$

$p_c$  ... (wholesale) market price for (conventional) electricity

$p_{MC}$  ... marginal price for RES-E (due to quota obligation)

MC ... Marginal cost-resource curve for RES-E generation

Source: Huber *et al* (2004) and Resch *et al* (2009). Note:  $Q^*$  = Quota or target;  $MgC^*$  = Marginal costs of the last technology needed to comply with the RES-E target/quota.  $p_e$  = Wholesale price of electricity.  $MgC_{res-e}$  = Marginal cost curve of RES-E generation.



# Dynamic efficiency

- Ability of an instrument to generate a continuous incentive for technical improvements and costs reductions in renewable energy technologies
- Key in a problem with long-term horizons such as climate change
- Relevant data provided by Green-X modelling

**Indicator:**

Learning index => RES technologies' reduction in investment cost (€/MW) between 2020-2030, weighted by the energy production from these new installations.

Technology portfolio diversification (Herfindahl-Hirschman-Index as a measure of concentration)

# Equity

- Even if an instrument leads to net benefits for society as a whole, there will be winners and losers
- On Member State level: Does a given instrument lead to a concentration of the costs of RES-E promotion in a limited number of countries?
- Relevant data is provided by Green-X

**Indicator:**

Variation of policy cost (in % of GDP) across EU-27 (Standard deviation)



# Environmental and economic effects

- Positive effects are possible for the country where the RES-E plants are located, or for the EU as a whole
- Here we focus on benefits for the EU as a whole
- Relevant data provided by Green-X modelling

## Indicators:

average annual greenhouse gas emissions avoided due to RES installed between 2021-2030  
(expressed in bn €)

average annual fossil fuel imports avoided due to RES installed between 2021-2030.

# Socio-political acceptability

- related to the existence of real or perceived local drawbacks or benefits for specific Member States (MSs) or regions
- Related to support cost and to economic and environmental effects
- Data from interviews with 7 Member State representatives

**Indicator:**

Preference of national decision makers => scale from 1 („very unlikely to be politically acceptable in my country“) to 5 („very likely to be politically acceptable in my country“)

# Legal feasibility

- two aspects: legislative competence; and compatibility with other EU primary and secondary law
  1. Does the EU have competence to legislate with regard to each specific pathway? How complex is the adoption procedure?
- Data from legal analysis

**Indicator:**

Adoption procedure => qualitative legal analysis; scale from „easy“ to „difficult/impossible“ (0-10)

# Possible policy pathways for harmonization

# PATHWAYS

## POLICY CONCEPTS

- Convergence
- Coordination
- Cooperation
- Harmonisation

## METHODOLOGY

- Building pathways:
  - An extensive literature review.
  - Stakeholder consultation.
  - A consortium-internal cross-check

# PATHWAYS

- Many possibilities:
  - **“what”** options : targets, support scheme, design elements, support level.
  - **“how”** options: i.e., whether decisions are taken at EU or MS level.

# PATHWAYS

- DEFINITION OF PATHWAYS:
  - Pathways are defined at two levels:
    - Degrees of harmonisation
      - administrative level at which decisions are taken
      - national RES-E targets and a European target?
    - Pathway components to be harmonised: Framework conditions, instruments, design elements, use of cooperation mechanisms and cost-allocation.

Combining the components under degrees of harmonisation results in a broad set of pathways.

# PATHWAYS

Degrees of harmonisation.

– Four alternatives:

- Full
- Medium
- Soft
- Minimum

– Focus on critical aspects:

- whether MS targets coexist with the EU-wide target,
- administrative level at which decisions are taken (EU / MS).



# PATHWAYS

- Degrees of harmonisation

Degree of harmonisation	MS targets	Support scheme	Decision on design elements	Decision on support level
Full	No	EU-wide	EU	EU
Medium	No	EU-wide	EU	EU (plus additional MS support)
Soft	Yes	Same instrument used in MS, not uniform	MS (some imposed by EU)	MS
Minimum	Yes	MS decision.	MS (some imposed by EU)	MS

EU-wide target

# PATHWAYS

- Components to be harmonised:
  - Framework and other conditions of support
  - Instruments.
  - Design elements.

# PATHWAYS

- Framework and other conditions of support.
  - Aspects for RES-E support outside the support system.

## Targets

Geographical coverage

Sectoral coverage

Eligibility of plant in other countries

Authorisation procedures

Grid access conditions

Distributions of grid connection costs

Use of secondary instruments

Cost allocation (burden sharing)

Use of cooperation mechanisms

# PATHWAYS

- Instruments and design elements.
  - Instruments (FITs, quotas with TGCs, tendering).
  - Common design elements.
  - Instrument-specific design elements.

# PATHWAYS

- Common design elements.
  - *Eligibility of plants (new vs. existing).*
  - *Constant or decreasing support level during support period.*
  - *Eligibility of technologies*
  - *Duration of support.*
  - *Cost burden of RES-E support.*
  - *Technology-specific support.*
  - *Size-specific support level.*
  - *Location-specific support.*

**The specific form of those design elements  
may differ between instruments, however.**

# PATHWAYS

- Instrument-specific design elements...
  - FIT / FIP.
  - TGC schemes
  - Tendering.
- Very relevant design elements.
- Decisions on design elements are taken:
  - At EU level (full, medium).
  - EU level and MS level (soft, minimum).

Degree of harmonisation		Characterisation	Instrument					
			FIT (feed-in tariff)	FIP (feed-in premium)	QUO (quota system with uniform TGC)	QUO banding (quota system with banded TGC)	ETS (no dedicated RES support)	TEN (Tendering for large scale RES)
<u>Full</u>	<ul style="list-style-type: none"> <li>•EU target</li> <li>•One instrument</li> </ul>		1a	2a	3a	4a	5	6 •Sensitivity to 7 (national support, but harmonisation for selected technologies)
<u>Medium</u>	<ul style="list-style-type: none"> <li>•EU target</li> <li>•One instrument</li> <li>•Additional (limited) support allowed</li> </ul>		1b	2b	3b	4b		
<u>Soft</u>	<ul style="list-style-type: none"> <li>•National targets</li> <li>•One instrument</li> <li>•MS can decide on various design elements incl. support levels</li> </ul>		1c	2c	3c	4c		
<u>Mini- mum</u>	<ul style="list-style-type: none"> <li>•With minimum design standards for support instruments</li> <li>•National targets</li> <li>•Cooperation mechanism (limited/strong RES cooperation)</li> </ul>		7 <b>Reference</b> (national RES support with cooperation) ((limited or) strong cooperation ... (without or) with minimum design standards)					
<u>No</u>	<ul style="list-style-type: none"> <li>•No minimum design standards for support instruments</li> </ul>							

*Thank you for your attention!*

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