

Policy criteria and possible policy pathways for harmonization

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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

CRITERIA

- Theoretical background and methodology.
 - Aim: not a definitive set of relevant criteria but a filter. Manageable.
 - A list of criteria whose relevance will be judged by stakeholders

CRITERIA

- Assessment criteria
 - Effectiveness.
 - Cost-effectiveness.
 - Dynamic efficiency.
 - Equity.
 - Environmental and economic effects.
 - Socio-political feasibility.
 - Legal feasibility.

CRITERIA

- Effectiveness.
 - Ratio of the change in the normalised electricity generation over a given period of time and the additional realisable potential for a specific technology.

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

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

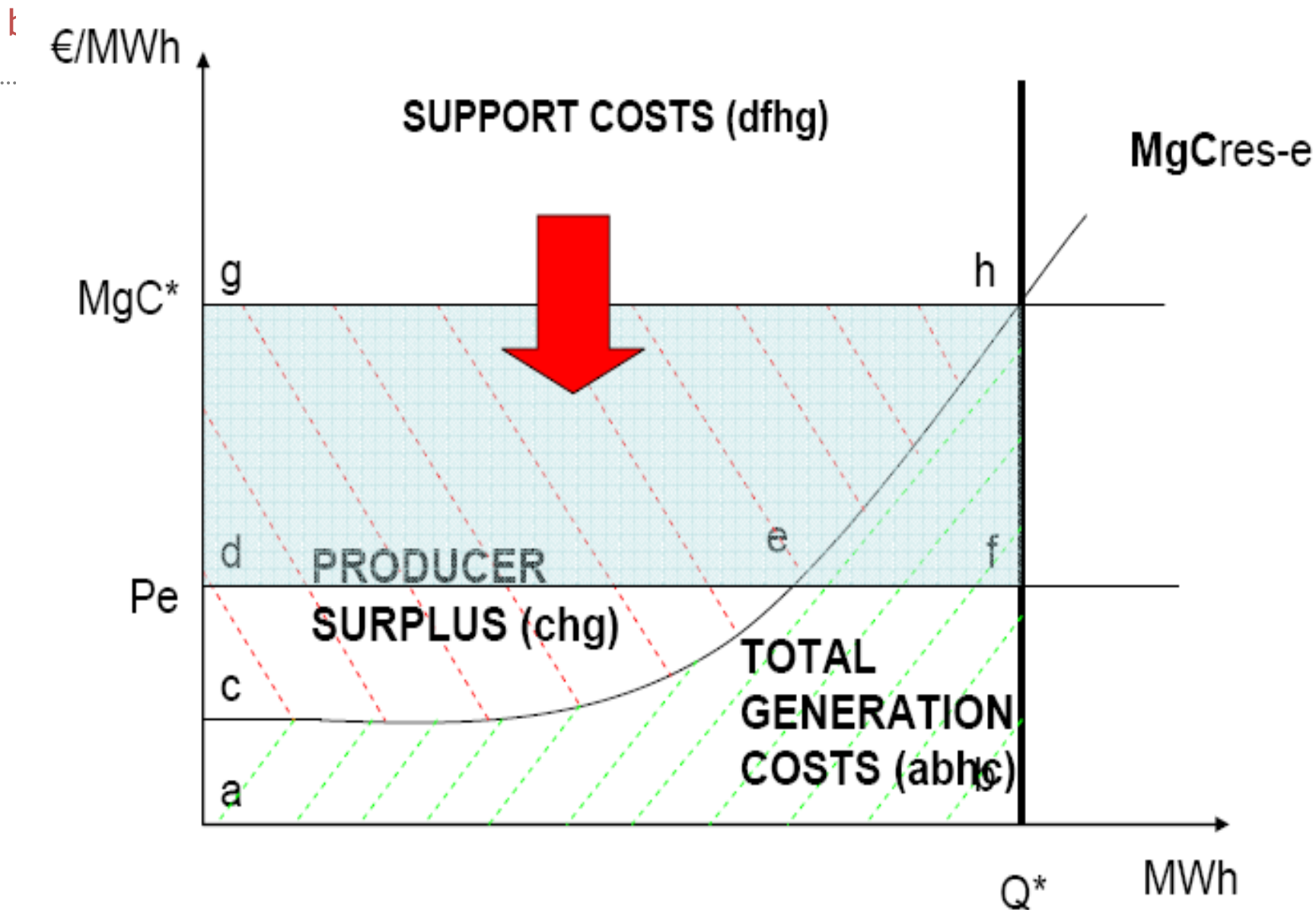
$ADD - POT_n^i$ Additional generation potential of RES technology i in year n until 2020

CRITERIA

- Effectiveness.
 - Target attainment:
 - extent to which targets for the penetration of renewable energy are fulfilled
 - trend towards the fulfilment of those targets over time (i.e., interim targets in RES Directive).
 - Support schemes: only one possible influence on effectiveness

CRITERIA

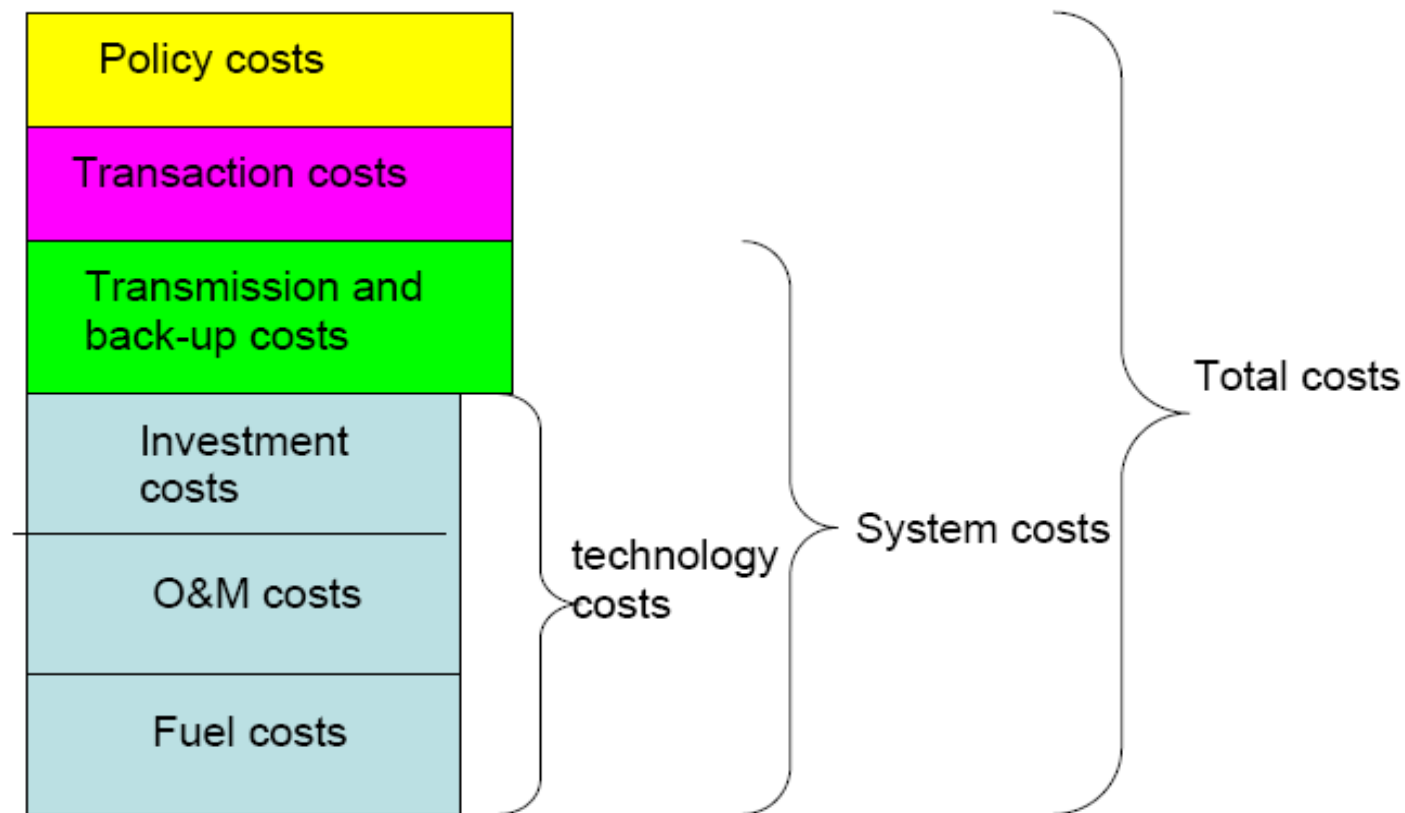
- Cost-effectiveness.
 - Achievement of a given RES-E target at the lowest possible cost to society.
 - Minimise generation costs.
 - Technologies, sizes and places.
 - Minimisation of policy costs.
 - Finally paid by consumers or taxpayers.



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. Pe = Wholesale price of electricity. MgC_{res-e} = Marginal cost curve of RES-E generation.

CRITERIA

Cost-effectiveness.



CRITERIA

- Dynamic efficiency.
 - Ability of an instrument to generate a continuous incentive for technical improvements and costs reductions in RETs.
 - Several aspects:
 - Diversity.
 - Private R&D.
 - Learning effects.

CRITERIA

- Dynamic efficiency.
 - Technological diversity.
 - Ambitious RES-E deployment targets can only be attained cost-effectively by *simultaneously* (not sequentially) promoting different technologies

CRITERIA

- Dynamic efficiency.
 - Private R&D investments
 - Deployment feeds back into RD&D:
 - the existence of a stable market for RETs (*demand-pull*);
 - the existence of a surplus for generators to be reinvested in RD&D (*supply-push*).

CRITERIA

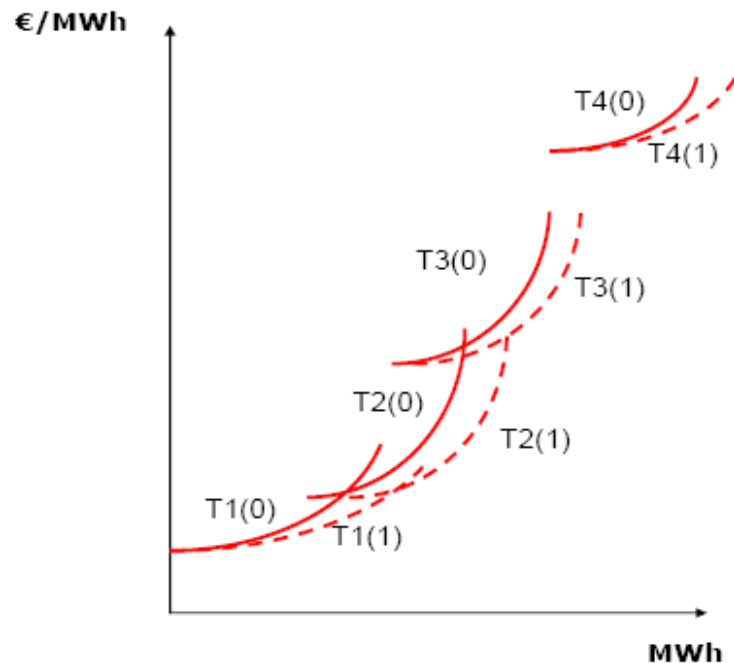
- Dynamic efficiency.
 - Downward shift of technology costs and generation costs.

Dynamic efficiency

Support at
time 0, leads
to lower costs
at time 1



Shift in the
RES-E
marginal cost
curves.



CRITERIA

- Equity.
 - In BEYOND2020: whether a given instrument leads to a concentration of the costs of RES-E promotion in a few countries.
 - Compliance costs may fall disproportionately upon countries with lower GDP per capita.

CRITERIA

- Environmental and economic effects.
 - Positive effects of RES-E deployment at EU level:
 - Reduction in GHG emissions and local pollutants.
 - Avoided fossil fuel consumption, better trade balance (exports minus imports).

CRITERIA

- Socio-political acceptability.
 - Social rejection: general (i.e., civil society is against the deployment of renewables or against deployment support) or local ('NIMBY').
 - Existence of real or perceived local benefits for specific MS.
 - Related to other criteria (i.e., cost-effectiveness).
 - Increasingly important as RETs continue to grow in both size and number.

CRITERIA

- Socio-political acceptability.
 - Political feasibility: attractiveness for policy makers of a given pathway.
 - Procedures for adoption of the respective policy pathway and role of the MS (unanimity decision or qualified majority).

CRITERIA

- Legal feasibility.
 - Legislative competence.
 - Whether the Union has competence to legislate with regard to each specific pathway.
 - which provision represents an appropriate legal basis.
 - Compatibility of each pathway with provisions of EU primary and secondary law

CRITERIA

Criteria	Indicator
Effectiveness	<ul style="list-style-type: none"> • <i>Ratio of the change in the normalised electricity generation during a given period of time and the additional realisable potential for a specific technology for each pathway.</i> • <i>Target fulfilment (interim and final targets).</i>
Cost-effectiveness	<ul style="list-style-type: none"> • <i>Generation costs (investment costs, capital costs, O&M costs and fuel costs for biomass).</i> • <i>Transmission costs (costs of grid reinforcement and extension).</i> • <i>Back-up costs.</i> • <i>Policy support costs</i> • <i>Transaction (incl. administrative) costs</i>
Dynamic efficiency	<ul style="list-style-type: none"> • <i>Technological diversity (degree of deployment of more expensive or relatively immature technologies, measured as percentage deployment of different technologies with respect to potentials by country).</i> • <i>Development of investment costs over time (€/kW).</i>
Equity	<i>Total policy cost for a Member-State per unit of GDP (or GDP per capita). Minimisation of variation of criterion value across the Member-States</i>
Environmental and economic effects	<ul style="list-style-type: none"> • <i>GHG emissions, air pollution</i> • <i>Reduction of fossil fuel imports in different pathways: trade balance affected (avoided fossil fuel consumption from Green-X).</i>
Socio-political feasibility	<ul style="list-style-type: none"> • <i>Revealed preference of (national) policy-makers for a specific pathway.</i> • <i>Procedures for adoption of the respective policy pathway and role of the MS (unanimity decision or qualified majority)</i>
Legal feasibility	<ul style="list-style-type: none"> • <i>Does the EU have competence to legislate the specific pathway (legal basis / lack of legal basis)? (Yes/No answer)</i> • <i>Does the policy pathway comply with EU primary and secondary law? (Likert scale).</i>



PATHWAYS

PATHWAYS

- 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.
- Keep the discussion manageable.

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

- Framework and other conditions of support.
 - Cost allocation, use of cooperation mechanisms and degrees of harmonization.

Degree of harmonization	Cost allocation	Role of cooperation mechanisms
Full	Equal or proportional payment.	Art 9
Medium	Equal or proportional payment.	Art 9 (6 with national targets)
Soft	No equalisation scheme of costs is required	All (art 6, 7, 9 and 11)
Minimum	No equalisation scheme of costs is required	All (art 6, 7, 9 and 11)

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).

<i>Instrument</i>		FIT <i>Fixed (Feed-in) tariff</i>	FIP <i>Feed-in premium</i>	QUO <i>Quota with TGC</i>	QUO <i>banding Quota with banded TGC</i>	ETS <i>(no dedicated support for RES)</i>	TEN <i>Tendering for large- scale RES</i>	Reference <i>(national RES support)</i>
<i>Degree of harmonisation</i>	<i>Characterisation</i>							
<u>Full</u>	<ul style="list-style-type: none"> One instrument EU target Burden sharing Yes / No 	1a	2a	3a	4a	5	6 Sensitivity to 7 (national support, but harmonisation for selected technologies)	7 <ul style="list-style-type: none"> National targets Co-operation mechanism: w/o increased cooperation w/o minimum design standards for support in- struments (i.e. with mini- mum design standards repre- sents a case of <u>Minimum Harmonisation</u>)
<u>Medium</u>	<ul style="list-style-type: none"> EU target One instrument Additional (lim- ited) support al- lowed 	1b	2b	3b	4b			
<u>Soft</u>	<ul style="list-style-type: none"> National targets One instrument MS can decide on various design elements incl. support levels 	1c	2c	3c	4c			

FURTHER INFORMATION

Visit the project's website:

<http://www.res-policy-beyond2020.eu/>