

Most Promising Market Design Options

RES Support

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- Analysis of RES support schemes from a long term perspective
- Analysis of RES support schemes from a short term perspective
- Selection of most promising options overall



Design options and specific assessment criteria for long-term effects of RES support

- **Design options assessed:**
 - ✓ Net metering of demand and generation per network user for computation of regulated charges
 - ✓ Long-term clean energy auctions
 - ✓ Feed-In Tariffs (with Regulated Prices and with Auction)
 - ✓ Feed-In Premiums regulated (with/without price cap and floors)
 - ✓ Feed-In Premiums resulting from an auction (with/without price cap and floors)
 - ✓ Certificate Schemes with Quota
 - ✓ Support conditioned to the provision of grid support services
 - ✓ No support scheme (conventional market remuneration)
- **Specific assessment criteria**
 - ✓ Efficiency (Cost reflectivity, Liquidity, Diversity of products traded in the market and Market transparency)
 - ✓ Effectiveness
 - ✓ Robustness
 - ✓ Implementability (Simplicity of the market, Experience with the implementation in other systems and Applicability to other time frames and contexts)

Most promising RES support schemes for each criterion: Long-term effects

	Weakest Design Options	In-between Design Options	Strongest Design Options
Efficiency Criterion	<ul style="list-style-type: none"> ✓ FIT with regulated prices ✓ Net metering of D and G ✓ Grid support services 	<ul style="list-style-type: none"> ✓ FIT with auction ✓ FIP regulated 	<ul style="list-style-type: none"> ✓ LT clean energy auctions ✓ FIP resulting from auction ✓ Certificate schemes ✓ No support scheme
Effectiveness Criterion	<ul style="list-style-type: none"> ✓ Grid support services ✓ No support scheme ✓ Net metering of D and G 	<ul style="list-style-type: none"> ✓ FIT with regulated prices ✓ FIP regulated 	<ul style="list-style-type: none"> ✓ LT clean energy auctions ✓ FIT with auction ✓ FIP resulting from auction ✓ Certificate schemes
Robustness Criterion	<ul style="list-style-type: none"> ✓ FIT with regulated prices 	<ul style="list-style-type: none"> ✓ FIP regulated ✓ Certificate schemes ✓ Grid support services 	<ul style="list-style-type: none"> ✓ No support scheme ✓ LT clean energy auctions ✓ Net metering of D and G ✓ FIP resulting from auction ✓ FIT with auction
Implementability Criterion	<ul style="list-style-type: none"> ✓ LT clean energy auctions ✓ Certificate schemes ✓ Grid support services ✓ FIP resulting from auction 	<ul style="list-style-type: none"> ✓ FIP regulated ✓ FIT with auction ✓ Net metering 	<ul style="list-style-type: none"> ✓ No support scheme ✓ FIT with regulated prices

Most promising RES support schemes regarding their long term effects

Assessment Criteria	Design Options
High Grades	<ul style="list-style-type: none">✓ FIP resulting from auction✓ FIT with auction✓ Long-term clean energy auction✓ No support scheme ⁽¹⁾
Average Grades	<ul style="list-style-type: none">✓ Certificate Schemes with Quota✓ FIP regulated
Low Grades	<ul style="list-style-type: none">✓ Net metering of Demand and Generation✓ Provision of grid support services✓ FIT with regulated prices

⁽¹⁾ Although with overall strong grades in the assessment criteria hereby considered, we would discard this design option since it performs very poorly under the Effectiveness criterion and, therefore, cannot comply with the policy objectives set for RES targets in the Long-term.

Most promising RES support schemes regarding their long-term effects: arguments

Design Options

- ✓ FIP resulting from auction
 - ✓ FIT with auction
- ✓ Long-term clean energy auction
- ✓ Certificate Schemes with Quota

- ✓ FIP regulated
- ✓ Net metering of Demand and Generation
- ✓ Provision of grid support services
- ✓ FIT with regulated prices

Weak points (-)

- LT clean energy auction: Less easy to extend to wide areas and to a wide range of overall market designs since it probably requires a central buyer
- FIT with auction: Poor liquidity – No need to trade as revenue is unrelated to spot market prices
- FIP resulting from auction & Certificate schemes: Increased project risk dependent on spot market prices may raise difficulties to finance new projects


- May not reflect long term marginal cost of capacity for new RES projects in LT (may be set too high or too low)
- Does not foster liquidity in LT, or ST
- Difficulty to access information (discrimination may exist)
- Fail to meet LT RES targets
- Less resilient to LT political intervention (except for Net Metering)

Strong points (+)

- Tend to reveal the LT marginal cost of RES capacity in procurement schemes for new projects
- Tend to foster liquidity as revenues (partially) depend on spot market prices (except for FIT with auction)
- Effective to meet LT RES targets
- Resilient to LT political intervention
- Simple to understand by all stakeholders
- Easy access to information
- Implemented throughout several EU countries

- Implemented throughout several EU countries
- Easily extendable to wide areas and to a wide range of overall market designs

 Most promising design options (overall high grades)

 Discarded design options (overall low grades)

Design options and specific assessment criteria for short-term effects of RES support

- **Design options assessed:**
 - ✓ Net metering of demand and generation per network user for computation of regulated charges
 - ✓ Long-term clean energy auctions
 - ✓ Feed-In Tariffs (with Regulated Prices and with Auction)
 - ✓ Feed-In Premiums regulated (with/without price cap and floors)
 - ✓ Feed-In Premiums resulting from an auction (with/without price cap and floors)
 - ✓ Certificate Schemes with Quota
 - ✓ Support conditioned to the provision of grid support services
 - ✓ No support scheme (conventional market remuneration)
- **Specific assessment criteria**
 - ✓ Efficiency (Cost reflectivity, Liquidity, Cost Causality)
 - ✓ Robustness
 - ✓ Implementability (Cost Efficiency, Barriers to RES participation in markets)
 - ✓ Fairness (Difficulty to change support retroactively)

Most promising RES support schemes for each criterion: Short-term effects

	Weakest Design Options	In-between Design Options	Strongest Design Options
Efficiency Criterion	<ul style="list-style-type: none"> ✓ FIT ✓ Net Metering 	<ul style="list-style-type: none"> ✓ FIP (+without caps) 	<ul style="list-style-type: none"> ✓ LT Clean Energy Auctions ✓ Certificates ✓ No support
Robustness Criterion	<ul style="list-style-type: none"> ✓ FIT (regulated) ✓ FIP (regulated) 	<ul style="list-style-type: none"> ✓ FIT (auction) ✓ FIP (auction) ✓ Certificates ✓ Net Metering 	<ul style="list-style-type: none"> ✓ LT Clean Energy Auctions ✓ No support
Implementability Criterion	<ul style="list-style-type: none"> ✓ FIT ✓ FIP (regulated) 	<ul style="list-style-type: none"> ✓ LT Clean Energy Auction ✓ Certificates ✓ FIP (auction, no caps) 	<ul style="list-style-type: none"> ✓ Net Metering ✓ FIP (caps and auction) ✓ No support
Fairness Criterion	<ul style="list-style-type: none"> ✓ FIT (regulated) ✓ FIP (regulated) 	<ul style="list-style-type: none"> ✓ FIT (auction) ✓ FIP (auction) ✓ LT Clean energy Auctions ✓ Certificates 	<ul style="list-style-type: none"> ✓ No support


Most promising RES support schemes regarding their short term effects

Assessment Criteria	Design Options
High Grades	<ul style="list-style-type: none">✓ LT clean energy auction✓ No support scheme ⁽¹⁾
Average Grades	<ul style="list-style-type: none">✓ Certificates✓ FIP (auction)
Low Grades	<ul style="list-style-type: none">✓ FIT✓ FIP (regulated)✓ Net Metering

⁽¹⁾ Although with overall strong grades in the assessment criteria hereby considered, we would discard this design option since it performs very poorly under the Effectiveness criterion and, therefore, cannot comply with the policy objectives set for RES targets in the Long-term.

Most promising RES support schemes regarding their short-term effects: arguments


Design Options	Weak points (-)	Strong points (+)
<ul style="list-style-type: none">✓ Long-term clean energy auction<ul style="list-style-type: none">✓ Certificates✓ FIP (auction)	<ul style="list-style-type: none">• FIP (auction) and Certificates create non-negligible distortion of short term prices• Distortions created by FIP (auction) and Certificates are not stable• Relevant amount of support provided• Create some barriers to RES participation in markets	<ul style="list-style-type: none">• Limited distortion of efficient short term signals (lowest for LT Clean Energy Auctions)• Tend to foster liquidity as revenues (partially) depend on spot market prices• Certificates promote Cost Causality• Resilient to political intervention
<ul style="list-style-type: none">✓ FIP regulated✓ Net metering<ul style="list-style-type: none">✓ FIT	<ul style="list-style-type: none">• Create relevant distortion of short term prices (FIT-largest, FIP regulated-relevant, Net Metering-localized)• FITs and Net Metering reduce liquidity in short term markets• Prone to political intervention• Large support through regulated FIT and FIP	<ul style="list-style-type: none">• FIP regulated promotes liquidity in short term markets• Low overall support involved in Net Metering

 Most promising design options (overall strong grades)

 Discarded design options (overall weak grades)

Most promising RES support schemes from a global perspective

Design Options	Weak points (-)	Strong points (+)
<ul style="list-style-type: none"> ✓ Long-term clean energy auction ✓ Certificates ✓ FIP (auction) 	<ul style="list-style-type: none"> • FIP (auction) and Certificates imply some project risk and create some distortion of short term prices • Distortions in FIP (auction) and Certificates depend on system condit. • LT clean auctions difficult to extend to other markets (involves central buyer) • Relevant amount of support provided • Create some barriers to RES participation in markets 	<ul style="list-style-type: none"> • Tend to reveal the marginal cost of RES capacity in LT procurement schemes for new projects • Effective to meet LT RES targets • Limited distortion of efficient short term signals • Tend to foster both LT and ST liquidity • Certificates promote Cost Causality • Resilient to political intervention
<ul style="list-style-type: none"> ✓ FIP regulated ✓ Net metering ✓ FIT 	<ul style="list-style-type: none"> • May not reflect marginal cost of RES capacity for new projects • Fail to meet LT RES targets • Create relevant distortions of short term prices (FIT-largest, FIP regulated-relevant, Net Metering-localized) • FITs and Net Metering: reduce liquidity in short term markets • Prone to political intervention • Regulated FIP and FIT: Large support 	<ul style="list-style-type: none"> • FIP regulated promotes liquidity in short term markets • Low overall support involved in Net Metering • Experience within the EU • Can be extended to other systems

 Most promising design options (overall strong grades)

 Discarded design options (overall weak grades)



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Thank you very much
for your attention