How to support renewable electricity in France?

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Summary

I. The current support scheme

II. Changes needed to meet the challenges raised by the growth of renewable electricity (RES-E)
   - Regarding the support instrument
   - Regarding the institutional organization
   - A word on guarantees of origin (GoO)

III. The target scheme
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III. The target scheme
I. The current support scheme

TSO: transmission system operator
CDC: Caisse des dépots
CSPE: Contribution au service public de l’électricité

RES-E: Renewable Energy Sources
FIT: Feed-in-tariffs
TSO: Transmission System Operator
CDC: Caisse des dépots
CSPE: Contribution au service public de l’électricité

Diagram: Flowchart showing the current support scheme for renewable electricity in France.
I. The current support scheme

The Regulatory Commission of Energy (RCE) is in charge of:

- Assessing each year \( n \) the level of CSPE needed for the year \( n+1 \)
- Assessing costs for the designated buyer (FIT- avoided costs)
- Avoided costs are assessed based on market prices means (spot or futures)

Projected CSPE costs due to RES-E support (2009 – 2020)

2012 CSPE level (LFR 2011):
- 9 €/MWh → 30/06
- 10,5 €/MWh 01/07 → 01/2013?

Level needed:
- 13,7 €/MWh (11% average annual bill ATI for a residential consumer)
- 52% costs due to RES-E support
- CSPE deficit for 2012: 1,3 Md€
- Cumulative deficit in 2010: 2,7 Md€

Source: ERC (april 2011)
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II. Changes needed: regarding the support instrument

Why?

- With FIT, producers are not reactive to market price signals (i.e. electricity demand), with possible adverse consequences:
  1. Negative prices leading to collective losses
  2. No production profile optimization (important in particular for modular technologies such as biomass, hydro, geothermal)
  3. No economic incentive to develop storage
  4. Initial project localization based on expected total production, without taking into consideration the expected production profile

- In the medium-term, we expect RES-E to be competitive and producers to participate in the wholesale electricity market. It is therefore important
  - to facilitate the transition toward market integration
  - to facilitate innovative financial solutions (long-term contracts)
II. Changes needed: regarding the support instrument

How?

By giving producers the choice between two support instruments: FIT vs market value + premium (ex-post calculation) (ex. NL and DE 2012)

- Target remuneration: Levelized cost of electricity (LCOE)
- Public Cost = premium
- Mean market price for the RES-E cohort*
- Mean market price with no incentive
- Consumer surplus (avoided public costs)
- RES-E producer surplus (total remuneration)

* Cohort = set of project using the same technology (also possibly different cohort depending on date of commissioning)
Example for a given project in year n:

Producer income for production Q in year n:
- Market revenue $R_m = P \times Q$
- Provisional premium revenue $R_p = Q \times P_p \times 0.8$
- Complementary revenue $R_c = 0.2 \times P_p \times Q + Q \times (P_r - P_p)$
- Total revenue $R_t = R_m + R_p + R_c$

II. Changes needed: regarding the support instrument
Questions to be taken into consideration:

- **Increased revenue uncertainty for producers?**
  → *limited by the ex-post calculation (when his production profile is equal to the mean of his cohort, a producer will earn at least the target remuneration)*

- **Negative impact on producer cash-flows?**
  → *Pp must be set at a sufficient level to avoid cash-flow problems*

- **RES-E producers ability to bear trading and forecast costs?**
  → *feedback from DE: March 2012 30% RES-E capacities chose premium instrument*
  → *important to leave the choice between FIT and premium*

- **Producer ability to react to price signals?**
  → *feedback needed on both market orders and production profiles*
  → *depend on the technology (modular vs intermittent)*

- **Possibility to change between FIT and premium?**
  → *possible at least in the starting phase*

- **Eligibility of existing projects?**
  → *yes, but less ability to adjust than new projects (create ≠ cohorts ?)*
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II. Changes needed: regarding the institutional organization

Why?

- The current system diminishes the liquidity and transparency of the organized market
  - *RES-E are included in the designated buyer own balance perimeter*
- Imperfect assessment of costs and benefits for the designated buyer
  - *Difference between the estimated RES-E value (market prices means) and the real value for the designated buyer*
  - *Several costs and benefits not-included in the assessment (impact on balancing costs, administrative burden, forecasts, funding of CSPE deficit...)*
- Designated buyer both in the regulated and competitive sphere → costs and benefits linked to its designated buyer activity could generate distortions of competition
II. Changes needed: regarding the institutional organization

How?

- Designate a new RES-E buyer already in the regulated sphere, preferentially the TSO (ex. All, UK)
  - TSO exclusively in the regulated sphere
  - Consistent with some of the TSO current activities (system balancing; electricity purchase to compensate grid losses; some grid linkages)

- Producers would then have the choice between two options:
  - Option 1: FIT from the new designated buyer
  - Option 2a: Direct trading on the wholesale market + premium
  - Option 2b: Use of aggregator services
  - RES-E producers or aggregator are responsible for the balancing of their perimeters

- RES-E must be sold on the organized market (day-ahead or intraday) and isolated in a specific account
II. Changes needed: regarding the institutional organization

Questions to be taken into consideration

- Who gives the premium to RES-E producers in the new scheme?
  - GRT (already in charge of FIT, but potential cash-flow problem)
  - CDC (already in charge of designated buyers account and CSPE collection)
  - GRD? (already in charge of network linkage contracts)

- Impact on imbalance?
  - Loss of the current pooling effect which reduces imbalances for RES-E included in the designated buyer own perimeter (but not necessary increased global imbalances)
  - Optimal number of aggregator: balance between the need for competition and a minimal volume to mutualize uncertainties

- How to settle CSPE current deficit?
  - Current deficit isolated in a specific account. New procedure set in 2011 should prevent further deficits.
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II. Changes needed: a word on GoO

► Currently, no incentive for the designated buyer to sell GoO:
  - By law, in case of FIT, only the designated buyer can claim GoO
  - All GoO revenues are added to avoided cost and thus provide no benefits to the designated buyer

► Besides, GoO revenues in the current scheme would not be used to increase RES-E production:
  - It results only in a higher electricity price for the consumer who is willing to pay for GoO…
  - … and a lower price for all other consumers (at least in medium-term)

► Possible alternative scheme:
  - The designated buyer is compelled to sell all GoO (auction platform)
  - Revenues are directed toward a specific fund used to finance R&D in RES-E

► In the future, a new market segment could be created for GoO (if there is a sufficient number of sellers and buyers)
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Ⅲ. The target scheme: initial situation

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Financial flows?

RES-E flow

RES-E producers ≠ size ≠ technologies

TSO

CDC

Wholesale market

consumers

CSPE
III. The target scheme: option 1 Feed-in-Tariffs

Option 1: FIT through TSO

Relevant in the short-term for small non-modular projects (distributed PV)

Feed-in-tariffs (FIT)

TSO

Compensation

Sale on spot segments

Wholesale market

CDC

CSPE

consumers

RES-E flow
III. The target scheme: option 2 direct trading + premium

Relevant in the short-term for RES-E producers of a minimal size, ability to access the wholesale market and modular technologies.
III. The target scheme: option 3 aggregators

Relevant in the medium term for all small RES-E producers (need to develop aggregator activity)

Option 3: sale to an aggregator

Wholesale market

CDC (with the help of TSO/DSO?)

Negociated tariffs

Sale spot/future/OTC

Premium

aggregator 1

aggregator 2

aggregator 3

consumers

CSPE
III. The target scheme: option 4 direct trading + GoO

Relevant in the medium term:
1. When Res-E contract end
2. When GoO revenues exceed premium level*

* If contract termination is allowed

No more subsidies needed other than GoO
III. The target scheme: global vision

Option 1: FIT through TSO

Option 2: direct trading + premium

Option 3: sale to an aggregator

Option 4: direct trading + GoO