Can market-compatible renewable policies address climate change and security of supply?

Knut F. Kroepelien, Tallin, 4. May 2017

EnergiNorge

Outline

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2. Four proposals
    1. Adapt ETS to overlapping policies
    2. Remove exemptions to market exposure
    3. Make CRM the last, not first resort
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1. Background

Example – art. 25 Renewable Energy Directive

Article 25
Mainstreaming renewable energy in the transport sector

1. With effect from 1 January 2021, Member States shall require fuel suppliers to include a minimum share of energy from advanced biofuels and other biofuels and biogas produced from feedstock listed in Annex IX, from renewable liquid and gaseous transport fuels of non-biological origin, from waste-based fossil fuels and from renewable electricity in the total amount of transport fuels they supply for consumption or use on the market in the course of a calendar year.

The minimum share shall be at least equal to 1.5% in 2021, increasing up to at least 6.8% in 2030, following the trajectory set out in part B of Annex X. Within this total share, the contribution of advanced biofuels and biogas produced from feedstock listed in part A of Annex IX shall be at least 0.5% of the transport fuels supplied for consumption or use on the market as of 1 January 2021, increasing up to at least 3.6% by 2030, following the trajectory set out in part C of Annex X.

The greenhouse gas emission savings from the use of advanced biofuels and other biofuels and biogas produced from feedstock listed in Annex IX shall be at least 70% as of 1 January 2021.

For the calculation of the shares referred to in the second sub-paragraph, the following provisions shall apply:

a) for the calculation of the denominator, that is the energy content of road and rail transport fuels supplied for consumption or use on the market, petrol, diesel, natural gas, biofuels, biogas, renewable liquid and gaseous transport fuels of non-biological origin, waste-based fossil fuels and electricity, shall be taken into account;

b) for the calculation of the numerator, the energy content of advanced biofuels and other biofuels and biogas produced from feedstock listed in Annex IX, renewable liquid and gaseous transport fuels of non-biological origin, waste based fossil fuels supplied to all transport sectors, and renewable electricity supplied to road vehicles, shall be taken into account.

For the calculation of the numerator, the contribution from biofuels and biogas produced from feedstock included in part B of Annex IX shall be limited to 1.7% of the energy content of transport fuels supplied for consumption or use on the market and the contribution of fuels supplied in the aviation and maritime sector shall be considered to be 1.2 times their energy content.

c) For the calculation of both numerator and denominator, the values regarding the energy content of transport fuels, as set out in Annex III, shall be used. For the determination of the energy content of transport fuels not included in Annex III, the Member States shall use the respective ESOs standards for determination of calorific values of fuels. Where no ESOs standard has been adopted for this purpose, the respective ISO standards shall be used.

2. For the purpose of paragraph 1, Member States shall set up a system allowing fuel suppliers to transfer the obligation set out in paragraph 1 to other fuel suppliers and ensure that all transfers are documented in the national databases referred to in paragraph 4.

3. To determine the share of renewable electricity for the purposes of paragraph 1 either the average share of electricity from renewable energy sources in the Union or the share of electricity from renewable energy sources in the Member State where the electricity is supplied, as measured two years before the year in question may be used. In both cases, an equivalent amount of guarantees of origin issued in accordance with Article 19 shall be cancelled.

The share of renewable energy in liquid and gaseous transport fuels shall be determined on the basis of the share of renewable energy in the total energy input used for the production of the fuel.

For the purposes of this paragraph, the following provisions shall apply:

(a) When electricity is used for the production of renewable liquid and gaseous transport fuels of non-biological origin, either directly or for the production of intermediate products, either the average share of electricity from renewable energy sources in the Union or the share of electricity from renewable energy sources in the country of production, as measured two years before the year in question, may be used to determine the share of renewable energy. In both cases, an equivalent amount of guarantees of origin issued in accordance with Article 19 shall be cancelled.

However, electricity obtained from direct connection to an installation generating renewable electricity (i) that comes into operation after or at the same time as the installation producing the renewable liquid and gaseous transport fuel of non-biological origin and (ii) is not connected to the grid, can be fully counted as renewable electricity for the production of that renewable liquid and gaseous transport fuel of non-biological origin.

(b) When biomass is processed with fossil fuels in a common process, the amount of biofuel in the product shall be established applying adequate conversion factors to the biomass input. In case the process yields more than one product, all products stemming from the process shall be assumed to contain the same share of biofuel. The same rules shall apply for the purposes of Article 27(1).

4. Member States shall put in place a database enabling tracing of transport fuels that are eligible for counting towards the numerator set out in paragraph 1(b), and require the relevant economic operators to enter information on the transactions made and the sustainability characteristics of the eligible fuels, including their life cycle greenhouse gas emissions, starting from their point of production to the fuel supplier that places the fuel on the market.

The database shall include information on the requirement placed on fuel suppliers described in paragraph 1 and how the requirement is fulfilled.

The national databases shall be interlinked so as to allow transactions of fuels between Member States to be traced. In order to ensure the compatibility of national databases, the Commission shall set out technical specifications of their content and use by means of implementing acts adopted in accordance with the examination procedure referred to in Article 31.

5. Member States shall report on the aggregated information from the national databases, including fuels' life cycle greenhouse gas emissions, in accordance with Annex VII of Regulation [Governance].

6. The Commission is empowered to adopt delegated acts in accordance with Article 32 to further specify the methodology referred to in paragraph 3(b) of this Article to determine the share of biofuel resulting from biomass being processed with fossil fuels in a common process, to specify the methodology for assessing greenhouse gas emission savings from renewable liquid and gaseous transport fuels of non-biological origin and waste-based fossil fuels and to determine minimum greenhouse gas emission savings required for these fuels for the purpose of paragraph 1 of this Article.

7. By 31 December 2025, in the context of the biennial assessment of progress made pursuant to Regulation [Governance], the Commission shall assess whether the obligation laid down in paragraph 1 effectively stimulates innovation and promotes greenhouse gas savings in the transport sector, and whether the applicable greenhouse gas savings requirements for biofuels and biogas are appropriate. The Commission shall, if appropriate, present a proposal to modify the obligation laid down in paragraph 1.

Renewable energy quickly reaching maturity

Frankfurter Allgemeine

Windparks ohne Förderung

Erneuerbare Energie lohnt sich endlich

Windenergie ohne Staatszuschuss? Das hat kaum jemand erwartet. Doch jetzt wird bekannt: Offshore-Windanlagen machen den Strom so billig, dass Betreiber zum Teil auf die Zuschüsse verzichten. Das kommt auch dem Verbraucher zugute.

Auf dem Meer bläst der Wind verlässlicher als an Land.

Betreiber von Offshore-Windparks in der deutschen Nordsee erwarten keine Staatszuschüsse mehr, um Windenergie zu erzeugen. Das ist an diesem Donnerstag bekannt geworden – als Resultat einer Ausschreibung.

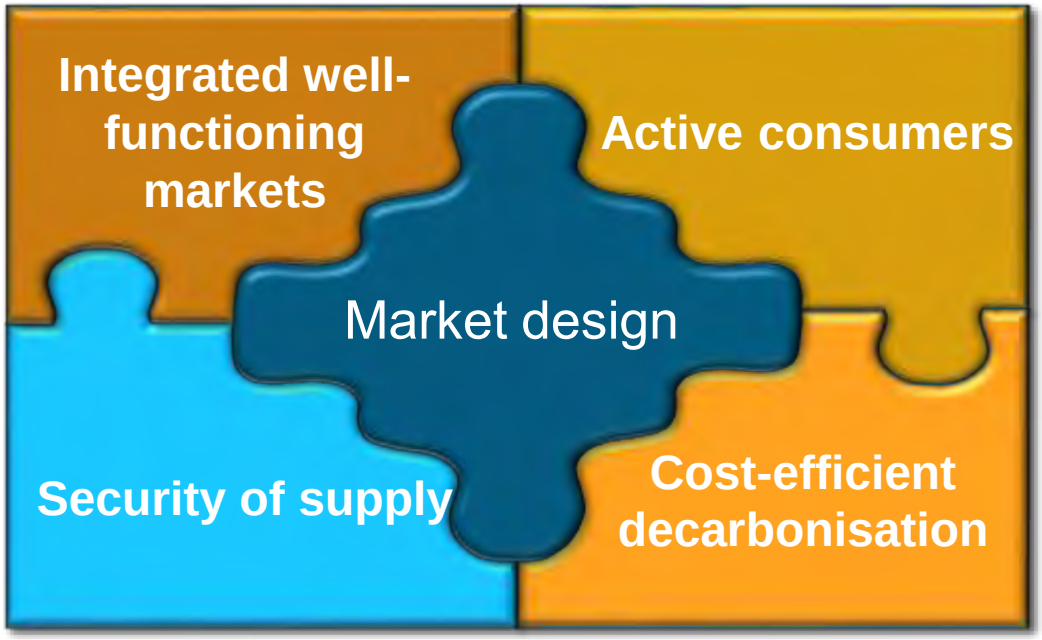


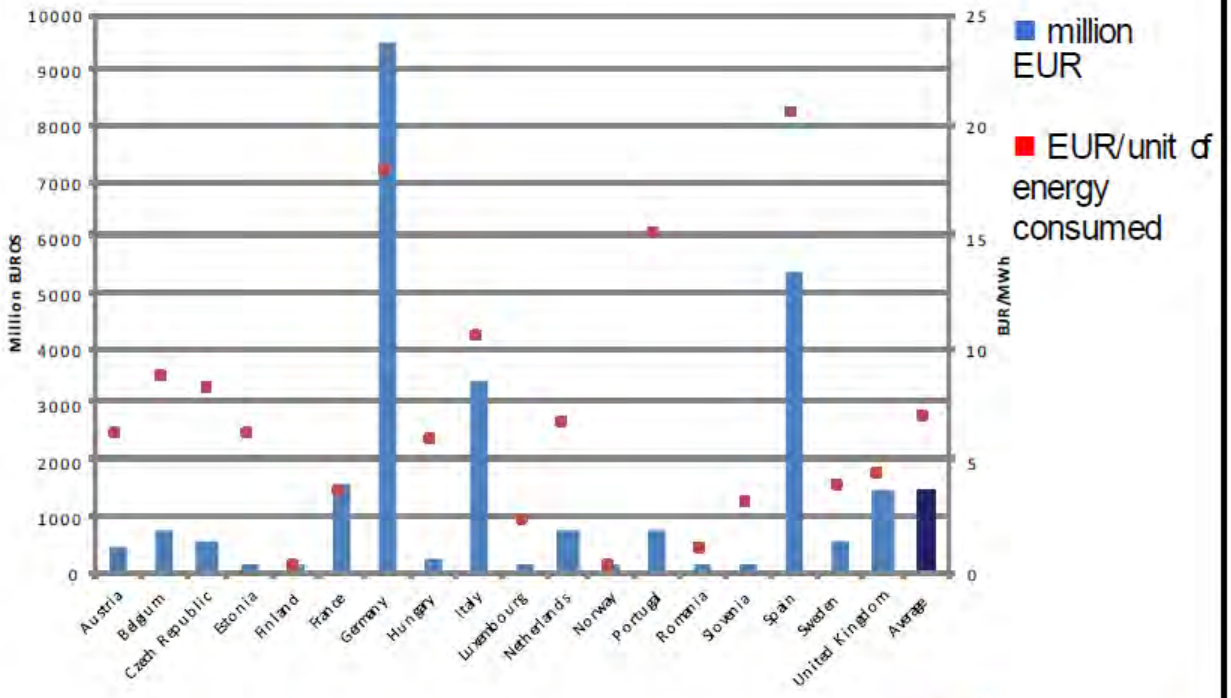
Chart 4: RES electricity support per unit of gross electricity produced in 2014, in [€/MWh]

Country	Bioenergy	Geothermal energy	Hydropower	Solar	Wind energy - Onshore	Wind energy - Offshore	Others	Total [€/MWh]
Austria	106,72	-0,59	12,68	19,67	51,33	-	-	60,04
Belgium	93,40	-	25,21	182,90	81,04	104,24	106,30	113,78
Croatia	134,93	-	83,83	267,21	52,39	-	-	74,21
Cyprus	125,00	-	-	141,91	166,60	-	-	154,37
Czech Republic	92,41	-	64,35	425,60	77,65	-	-	177,72
Denmark	34,36	-	-	138,65	41,57	41,39	68,37	46,02
Estonia	16,09	-	16,09	16,09	16,09	-	-	16,09
Finland	4,16	-	-	-	68,19	-	-	10,64
France	87,74	-	33,62	408,24	50,12	-	14,02	107,61
Germany	151,38	214,81	62,38	282,88	69,11	143,56	-	146,38
Greece	42,27	-	26,38	268,16	29,18	-	-	137,87
Hungary	70,21	-	30,79	64,58	70,64	-	-	65,53
Ireland	32,30	-	25,50	-	12,40	-	-	13,72
Italy	165,86	82,23	103,44	307,43	93,05	-	-	178,07
Latvia	129,42	-	130,03	-	57,17	-	-	120,22
Lithuania	41,76	-	24,67	119,21	31,00	-	-	39,64
Luxembourg	101,72	-	56,99	278,62	41,90	-	-	151,06
Malta	-	-	-	74,60	-	-	-	74,60
Norway	-	-	19,63	-	19,63	-	-	19,63
Poland	71,70	-	71,70	71,70	71,70	-	71,70	71,70
Portugal	68,92	-	56,91	270,57	55,48	132,24	60,94	61,91
Romania	50,11	-	50,11	50,11	50,11	-	-	50,11
Slovenia	82,85	-	6,57	201,57	20,57	-	-	109,35
Spain	64,83	-	26,06	281,28	33,39	-	-	91,24
Sweden	21,49	-	21,49	21,49	21,49	-	-	21,49
United Kingdom	56,43	-	64,95	231,88	63,31	54,67	54,67	70,53
Max. support	**165,86**	**214,81**	**130,03**	**425,60**	**166,60**	**143,56**	**106,30**	**178,07**
Min. support	**4,16**	**82,23**	**6,57**	**16,09**	**12,40**	**41,39**	**14,02**	**10,64**
Weighted average across 26 Member States								**110,43**
Arithmetic average across 26 Member States								**83,98**

Table 8: Weighted average support level in 2014, by technology, in [€/MWh][20]

CEER, 2016

RES-e support in Europe



Source: CEER, June 2013.

European Commission

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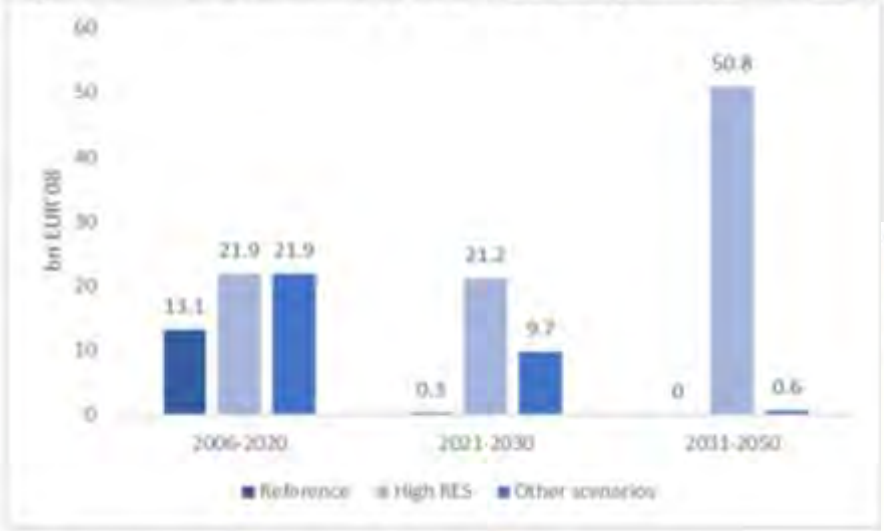
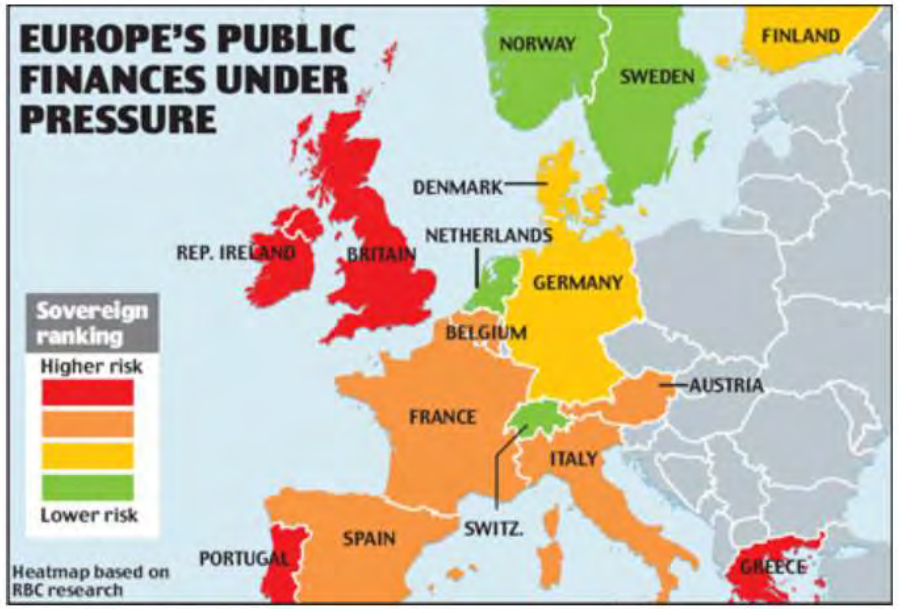
Investment needs – who should pay for what?

Figure 5: Investments in new electricity interconnectors (in billion EUR'08)



Source: Prepared by Trinomics based on EC (2011)



2.1 ETS-adaptation

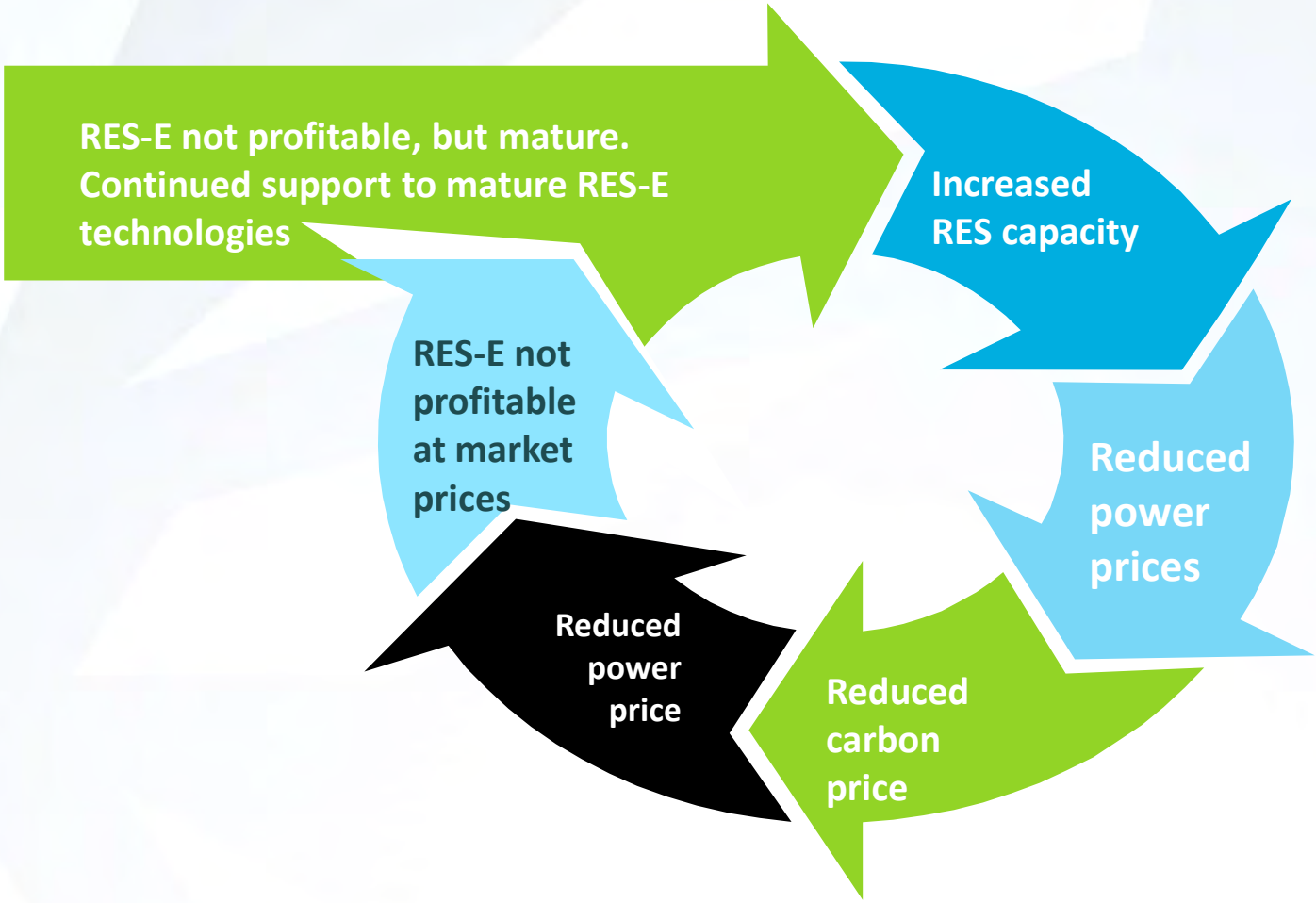
Governance regulation article 25 Assessment of progress

1. 1. By 31 October 2021 and every second year thereafter the Commission shall assess, in particular on the basis of the integrated national energy and climate progress reports, of other information reported under this Regulation, of the indicators and of European statistics where available:
[…]

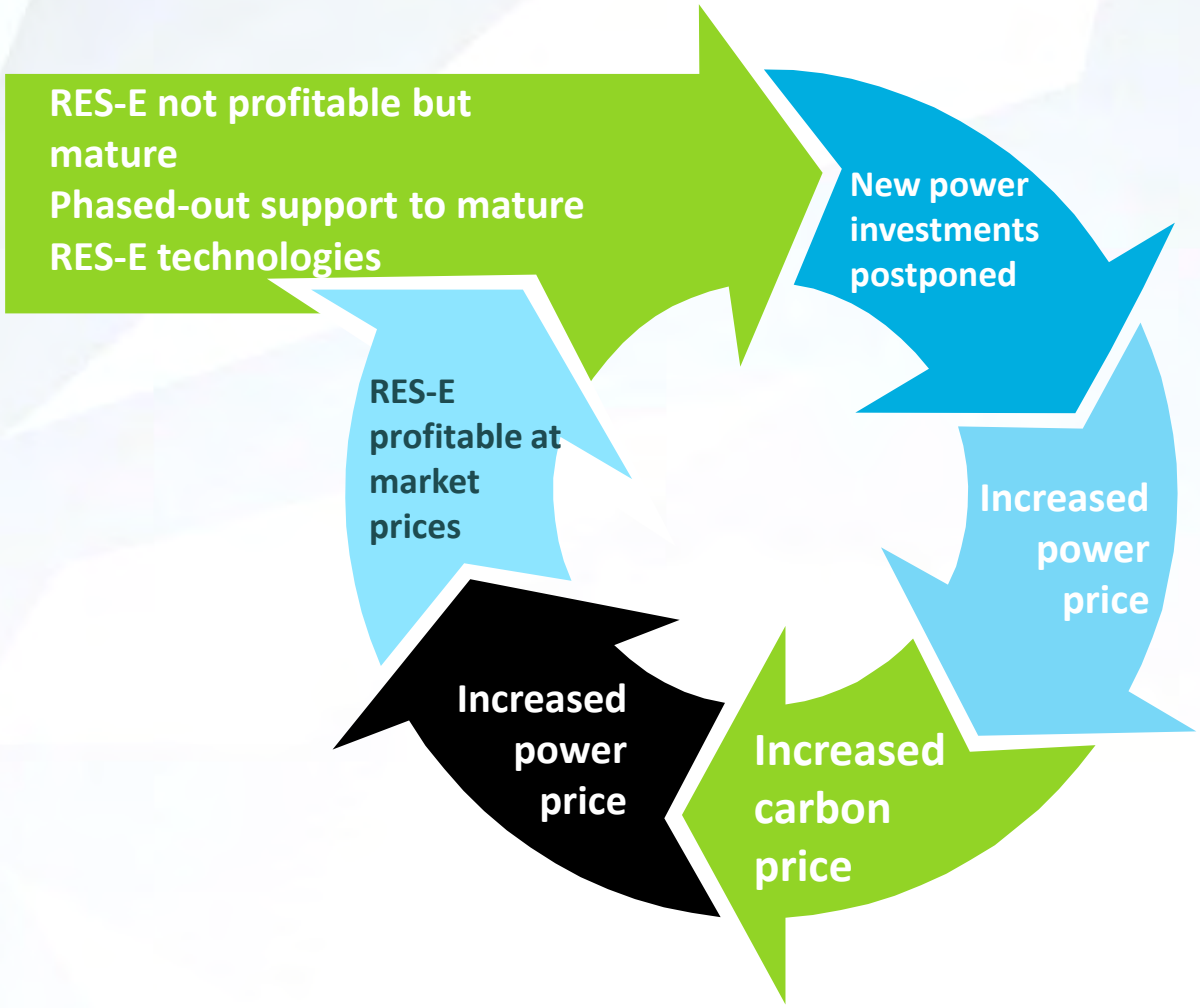
(d) the interaction of national measures and EU measures with the EU emissions trading scheme (ETS) and

(e) measures to limit the impact of overlapping energy and climate policies on the supply-demand balance of the EU ETS, including a consideration of using the Market Stability Reserve";

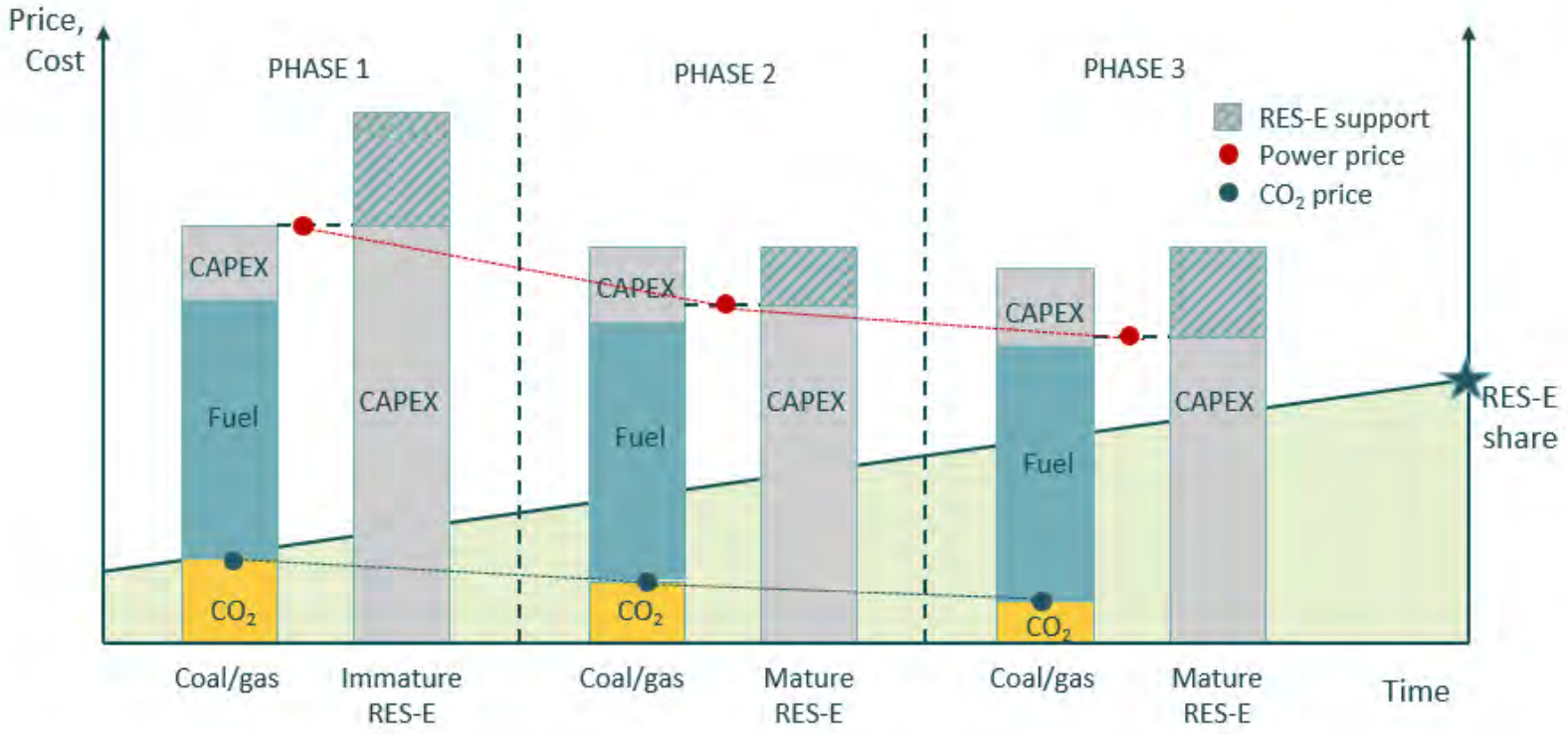
Market dynamics



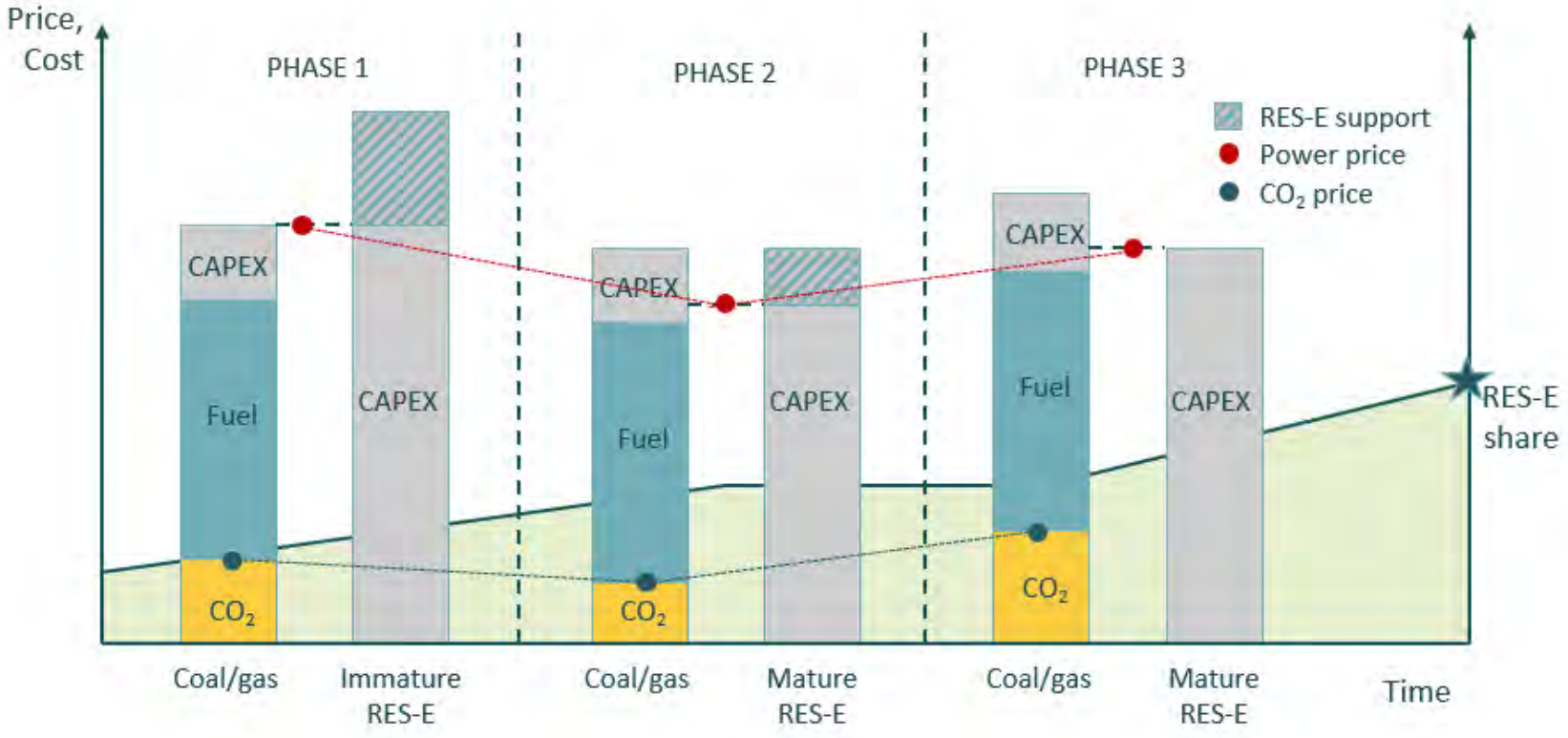
Alternative market dynamics



PRICE DEVELOPMENTS WITH CONTINUED RES SUPPORT



PRICE DEVELOPMENTS WITH PHASE-OUT RES SUPPORT



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2.2 Remove exemptions to market exposure

- Get rid of all price caps
- Introduce balancing requirements and normal dispatch for all market participants
- Strenghten the short markets (intraday)
- Allow price spikes – political commitment

→ Stimulates the flexibility solutions the market needs to allow high wind and solar penetration

Statnett

A European Energy-Only Market in 2030

Analysis report

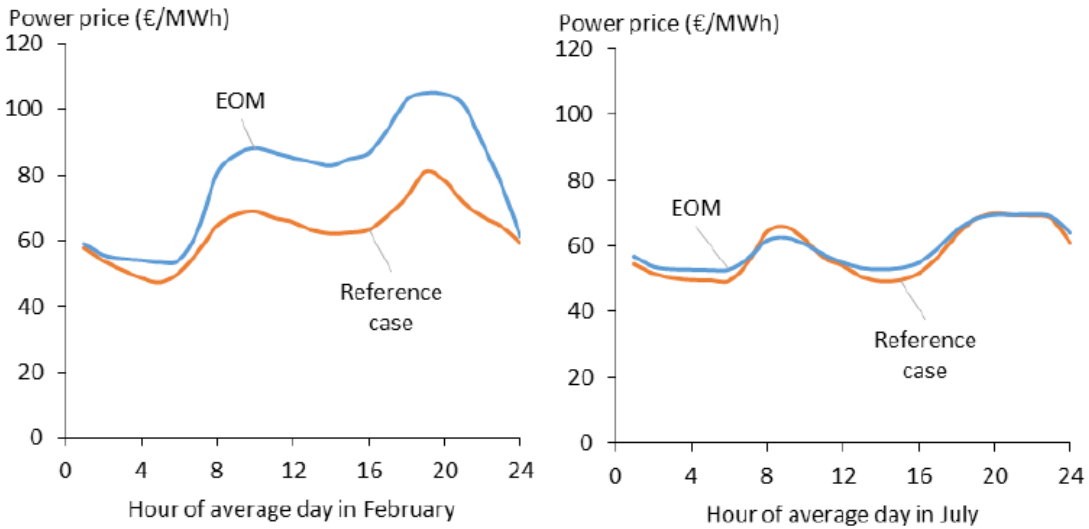

Figure 15. Average intraday price volatility in Great Britain in February (left) and July (right).

In sum, we see increased price volatility in hours of high residual demand, and decreased volatility in times of renewable generation surplus. Trying to estimate the overall effect on volatility, we define intraday price volatility as the average of hourly deviation per day from the average price level of that same day. If we look at this average over a year, we see that intraday price volatility doubles in our energy-only scenario, compared to our reference scenario. The periods of increased volatility increase the average more than the periods of decreased volatility do.

2.3 From CRM as first to CRM as last resort

- Regional adequacy assessment
- Electriciy regulation art 18.3 "MS shall publish a timeline for adopting measures to eliminate any identified regulatory distortions. When addressing resource adequacy concerns MS shall in particular consider removing regulatory distortions, enabling shortage pricing, developing interconnection, energy storage, demand side measures and energy efficiency."
- Transparency in data and methodology
- ENTSO-E is developing an improved European methodology building upon their experience on the mid-term adequacy forecast.

Security of supply in Europe 2030

- DG COM final report from sector enquiry

2.4 Regional co-operation - walk the talk

- Preamble "Mandatory regional consultations of other Member States on draft and final national plans are necessary to ensure adequate coordination of national planning processes and policies in the context of the Energy Union."
- Nordic experience – Swedish case
- TSO role
- Security of supply a regional issue – Nordic/Baltic to lead by example?

3. Next steps for green growth

- 2017 - Olilla-report – Nordic Stakeholder forum (?)
- 2017 – 2019 - Sound regulatory package EU
- 2018 – 2020 - New state aid guidelines (EEAG)
- 2020-2030 - Governance-process that reduces overlapping Polices and unneccessary market interventions

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