Tendances Carbone

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Energy Transition: yes to renewable energies, but at what price?

Renewable energies occupy a major place in the European energy transition program, which assigns them the ambitious targets of 20% in 2020 and 27% in 2030, and gives them a key role in the strategy of the Energy Union: "Becoming the number one in renewables". Indeed, renewable energy sources reduce dependence on imported energy, they emit little greenhouse gases and local pollutants and enable distributed generation, invigorating the territories. Among these energies, wind and solar power is preferred in areas where the potential of other renewables is modest (hydro, geothermal and various forms of bioenergy).

In countries with strong growth in electricity consumption, wind and solar power sources can easily be integrated into the mix, because their cost is competitive, and the steady development of networks enables them to be integrated into the grid at no extra cost. Finally, the complementarity with conventional energy sources is anticipated when signing contracts.

However in countries that are already well-equipped and where electricity consumption is stabilizing, the penetration of wind and solar power raises several difficulties. First, production cost per kWh is still higher than the existing conventional power plants (coal, gas, nuclear...), which are largely depreciated. Second, their implementation is based on the "resources" of wind and sun, which rarely coincides with the location of electrical networks, requiring extension and reinforcement of these. Third, the intermittent nature of their production is a commercial handicap. Therefore, the development of wind power and photovoltaic in these countries, particularly in Europe, requires active public policies. Thus, the European Union set out binding targets for Member States and imposed the injection priority of renewable power. Most States enforced provisions leading to remunerate these sources to a level independent of the electricity market and exempting producers of much of network costs as well as expenses related to the maintenance of security of supply, whatever the fluctuations of the wind and sun.

These policies have succeeded beyond all hope to stimulate the development of wind power and photovoltaic, which now accounts for a substantial share of the power mix in Germany, Denmark and Spain. But these developments have resulted in additional costs passed on to final consumers, who saw their bill increase rapidly. They also weakened the historical producers: firstly their markets shrank, newcomers capturing an increasing fraction of a virtually stable market, and secondly their incomes have unraveled, with market prices set by the plants with lower production costs. These market prices have become too low to allow investments in conventional power plants, which remain however essential to these hours with no wind or sun. Market prices are also too low for renewable energy to be profitable without aid; despite the remarkable decline in the production cost, it is still well above the observed price in the market. At what level should this support be set? Through its "guidelines" to harmonize State aid rules, the European Commission decided in July 2014 to mandate a tender procedure for the determination of certain aid, but this procedure does not say anything concerning their final amount.

To meet the targets that they have been assigned, States could be tempted to maintain high support, even if they are attributed by tender. It is unclear how they will also avoid providing support to conventional energy sources to ensure security of supply and capacity adequacy. The UK has taken a step forward by setting a guaranteed per kWh price for the future Hinkley Point nuclear power plant. Another option would be to give up the binding targets for renewable energy; their penetration will be slower in line with the closure of older plants and technological advances, including electricity storage solutions. This second avenue also has the advantage of allowing time for network evolution and implementation of lessons learned from the first years of experience; they reflect a more balanced policy supporting research and advanced technology, and not just exclusive support to existing technologies. In both cases, assigning a leading role to the power sector in the energy transition and the decarbonisation of the economy, the European Union cannot do without a profound revision of its electricity market and its emissions trading scheme (EU ETS), both designed at a time when nobody imagined that 35% of power consumption could come from renewable sources by 2020.

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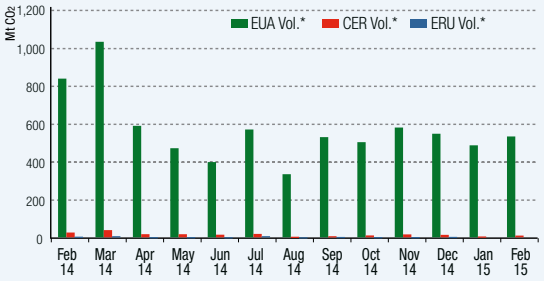
Key points

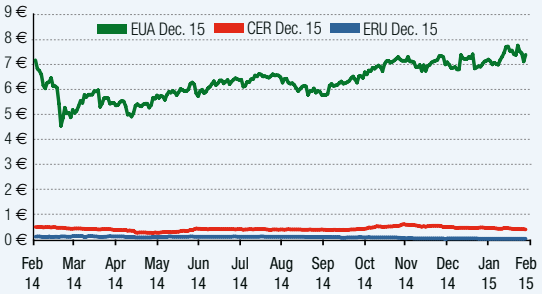
- **EU ETS – MSR timetable:** EU Latvian Presidency received from the Committee of Permanent Representatives of the Member States a mandate to open tripartite negotiations between Parliament, the Council and the European Commission.
- **Energy Union –** On 25th February, the EU Commission released its Energy Union Strategy, focusing on a new legislation to redesign the electricity market.
- **On 25th February,** the Commission released the EU's vision for the COP 21, calling for a transparent and dynamic legally binding agreement, containing fair and ambitious commitments from all Parties.

Trading volumes: EUA +9.63%, CER +107.05% ERU –100%



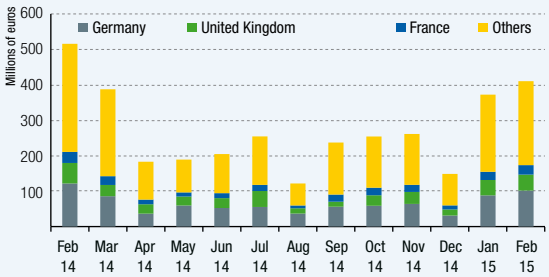
Source: CDC Climat Research calculation, based on data from EEX, ICE Futures Europe, NYMEX, Nasdaq OMX, and LCH Clearnet

Dec 15 contract price: EUA +4.09%



Source: CDC Climat Research, ICE Futures Europe

Monthly proceeds from Phase 3 auctions: 410.23 M€ in february 2015 (+10.2%)



Source: CDC Climat Research based on data from ICE Futures Europe, EEX

Energy

Primary energy prices and electricity prices

			Feb. 2015	
Coal	API # 2 CIF ARA (First month in USD/t)		61.4	▲
Natural gas	NBP (spot in €/MWh)		23.4	▲
	TTF (spot in €/MWh)		22.6	▲
Crude oil	Brent (First month in USD/b)		58.8	▲
Electricity	Germany (€/MWh)	Spot	39.3	▲
		Calendar	32.9	▲
	United Kingdom (€/MWh)	Spot	58.1	▲
		Next summer	60.0	▲
		Next winter	64.8	▲

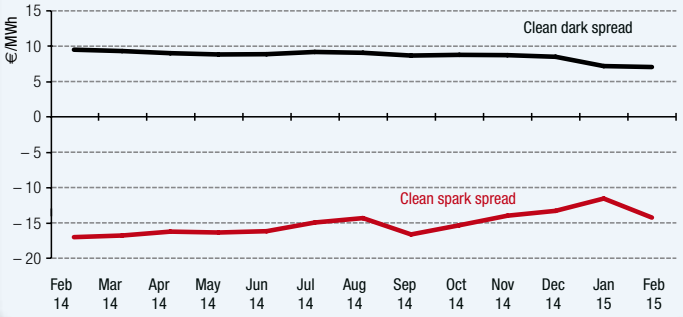
Sources: CDC Climat Research, Thomson Reuters

Clean dark, clean spark spreads and switching price

	Clean spark (€/MWh)		Clean dark (€/MWh)		Switching Price (€/tCO2)	
	spot	futures	spot	futures	spot	futures
Germany*	–8.5	–14.3	13.9	7.1	45.2	43.6
United Kingdom*	7.8	13.3	32.0	33.4	47.6	41.0

** Germany, 2015 calendar contract, United Kingdom, summer 2015 contract.*

German baseload – monthly average of Cal. 2015 clean dark and clean spark spreads



Sources: CDC Climat Research, Thomson Reuters

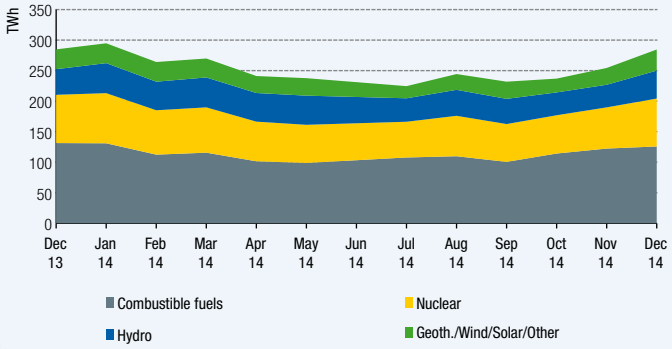
The substantial fall in commodity prices came to an end in February: the average monthly price of Brent increased to 58.8 $/bbl. Coal prices increased slightly to 61.4 $/t. NBP and TTF spot gas prices soared respectively by 13.5% and 14,2% to 23.4 €/MWh and 22.6 €/MWh. Low temperatures were indeed recorded during the month, spurring a rise in consumption while Russian and Norwegian supplies were low. Electricity prices followed this upward trend in fuel prices, compounded by low temperatures, low wind output, and unplanned nuclear outages. German short maturities have increased by 27.4% to 39.3 €/MWh while the contract for delivery in December 2016 was traded at 32.9 €/MWh on average. Finally, the German Clean Dark Spread rose in spot markets to 13.85 €/MWh, and decreased in future markets to 7.05 €/MWh, while the Clean Spark Spread increased in the spot and decreased in the future markets. The theoretical CO_2 "switch" price was calculated to 45.20 €/tCO_2 in the German spot power market and 47.56 €/tCO_2 in the British spot power market.

Production

Electricity generation (TWh)

EU 20 (in TWh)	Dec. 14	Cumulative from Jan. 14	Year-on-Year (% change)
Production	284.6	3,015.5	–3.4%
of which - Combustible fuels	125.8	812.5	–8.4%
- Nuclear	78.5	525.2	–1.7%
- Hydro	45.8	335.1	1.0%
- Geoth./Wind/Solar/Other	34.6	280.6	8.6%

** Gas, coal, oil.*

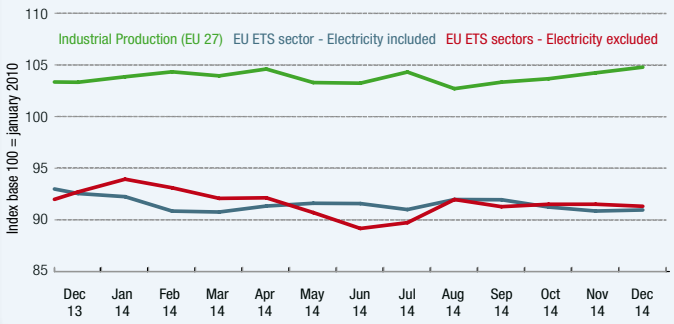


Source: CDC Climat Research, from IEA data

Production indices (Index base year 2010)

EU 27	Dec. 14	Last month (pts)	Year-on-Year (pts)
Indust. Prod (excl. construction)	104.8	0.5	1.5
EU ETS sectors production* (incl. electricity)	91.0	0.1	–1.6
EU ETS sectors production* (excl. electricity)	91.3	–0.2	–1.4
Electricity. gas and heating	90.8	0.3	–1.7
Cement	76.5	–3.1	–3.3
Metallurgy	107.3	5.3	–17.1
Oil refinery	95.1	1.5	3.1

** Index weighted by EU ETS sectors's weight in average total allocation over 2008-2012*

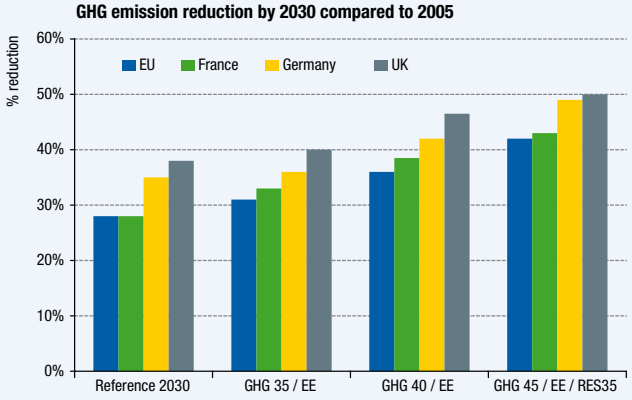


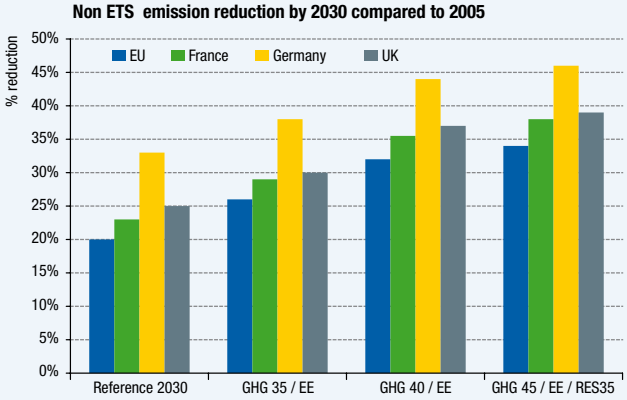
Source: CDC Climat Research from Eurostat data

Industrial production in the EU-27 countries rose by 0.5% in December 2014 compared to the previous month and by 1.5% compared to December 2013. The 0.6% increase in monthly industrial production is due to production of durable consumer goods rising by 2.0%, and energy by 0.3%. The largest decreases in industrial production were registered in Ireland (–12.4%), Portugal (–3.6%) and Malta (–3.3%), and the highest increases in Poland (+2.0%), France (+1.6%) and Sweden (+1.2%). Our production index for EU ETS sectors (including electricity) slightly increased to 91.0 pts, while the index excluding electricity decreased to 91.3 pts. Power generation in the 20 EU countries amounted to 284.6 TWh in December 2014, increasing 11.9 % compared to November 2014 and down 3.4% compared to December 2013. Compared to the year 2013, an increase in the cumulative hydraulic generation was observed (+1.0%), and in the cumulative generation of renewable energy (+8.6%), while cumulative fossil fuel generation decreased by 8.4%.

Coordination of CO_2, EE and RES policies

The EU 2030 emission reduction target: impact on Member States





Note: Reference refers to the scenario with no additional climate and energy policies on the trajectory of the 2020 objectives; GHG 35, 40 et 45 refer to the scenario with a 35%, 40% and 45%, GHG target, RES 35 refers to the scenario with a 35% EU level renewable energy target in the final consumption.

Source: European Commission, Impact Assessment, A policy framework for climate and energy in the period from 2020 up to 2030, 2014.

On 25th February, the EU Commission released its Energy Union Strategy, setting the out the goals of an energy union. It also contains steps the Juncker Commission intends to take to achieve it, including among others, new legislation to redesign and overhaul the electricity market, ensuring more transparency in gas contracts, substantially developing regional cooperation as an important step towards an integrated market, with a stronger regulated framework, new legislation to ensure the supply for electricity and gas, increased EU funding for energy efficiency or a new renewables energy package, focusing European R&D energy strategy. On 25th February, the EU Commission also released the EU's vision for the future climate international agreement (COP 21): the 2030 GHG reduction target of at least –40% approved in October 2014 will be the EU's contribution to the 2015 Paris Agreement, and the EU is seeking a transparent and dynamic legally binding agreement, containing fair and ambitious commitments from all Parties based on evolving global economic and geopolitical circumstances. The EU proposes that the 2015 agreement should preferably take the form of a Protocol under the UNFCCC and enter into force as soon as it is ratified by countries totalling 40 $GtCO_2$ equivalents. This is equivalent to approximately 80% of 2010 global emissions.

Institutional environment

Phase 3 supply balance table

	2013	2014	2015*	2016*	2017*	2018*	2019*	2020*
Auctions ($MtCO_2$)	**804**	**532**	**675**	**779**	**985**	**992**	**1,302**	**1,633**
Free allocation ($MtCO_2$)	**843**	**767**	**813**	**789**	**765**	**741**	**717**	**693**
Total	**1,647**	**1,299**	**1,488**	**1,568**	**1,750**	**1,733**	**2,019**	**2,326**

** Estimations*

Free allocation status table

EU Member State	2013	2014
France	82	81
Germany	169	163
United Kingdom	66	64
Others	526	459
TOTAL	**843**	**767**

Sources: CDC Climat Research, European Commission, ICE Futures Europe, EEX

CER and ERU supply

	Feb. 15	Last month change
Number of CDM projects	**12,275**	**+6.0**
of which - registered	7,598	+1.0
with - CER issued	2,746	+22.0
Cumulative volume of CER issued (Mt)	**1,541**	**+15.0**
Number of JI projects	**788**	**0.0**
of which - registered	604	0.0
Cumulative volume of ERU issued (Mt)	**863.5**	**0.0**
via - Track 1	838.1	0.0
via - Track 2	25.4	0.0

Sources: CDC Climat, UNEP-DTU

On 24th February, the ENVI Committee adopted a report to introduce the MSR. The key point of the ENVI agreement are 1/ the MSR will be established in 2018 and shall operate by 31 December 2018 2/ changes in auction volumes will take place without undue delay after the publication of the total number of allowances in circulation in May each year; 3/ the 900 million allowances withheld from auctioning from the back loading proposal and any unallocated allowances will be moved directly to the reserve; 4/ 300 million allowances from the pool of unallocated allowances will be made available to develop breakthrough technologies, between the start date of the operation of the MSR and until 31 December 2025; 5/ the Commission is requested to look at the carbon leakage rules in the EU ETS six months after the adoption of the Decision on the MSR and, if appropriate, wil present a legislative proposal; and 6/ the MSR will be reviewed three years after it starts. However, eight Member State (led by Poland, and on behalf of Cyprus, Bulgaria, Croatia, Czech Republic, Hungary, Lithuania and Romania) sent a letter on their opposition of an early start date of the MSR to the EU Commission. On 25th March, the COREPER meeting of EU Ambassadors approved a mandate for the Latvian Presidency to start trilogue negotiations with the EU Parliament and the EU Commission. The first trilogue meeting between these EU institutions took place on 30 March. The text approved by COREPER refers to a start date of the MSR on 1st January 2021.

Carbon markets dashboard

Primary market - EUA auctions in Phase 3

		Feb-14	Mar-14	Apr-14	May-14	Jun-14	Jul-14	Aug-14	Sep-14	Oct-14	Nov-14	Dec-14	Jan-15	Feb-15
Common Auction Platform + United Kingdom & Germany	Price (€/t)	6.45	6.35	7.35	5.03	5.54	5.91	6.23	5.96	5.99	6.78	6.74	6.89	7.20
	Volume (Mt)	80.33	60.98	35.22	37.72	37.02	43.28	19.52	39.79	42.05	38.56	22.04	54.06	57.00
Auction Revenues (M€)	Germany	121.62	85.73	36.53	59.46	52.45	55.37	36.75	56.07	58.71	63.97	31.17	88.04	101.65
	United Kingdom	57.88	31.69	26.48	25.35	27.82	44.97	14.93	14.13	29.65	33.78	17.15	43.38	44.97
	France	31.21	24.78	13.13	11.65	14.01	17.35	7.90	20.14	21.35	20.03	11.51	23.14	26.76
	Others	304.96	245.15	106.82	92.56	110.32	136.70	62.03	146.78	144.45	143.52	88.78	217.71	236.84
	Total	515.66	387.35	182.96	189.02	204.60	254.39	121.61	237.13	254.15	261.30	148.61	372.27	410.23

Sources: EEX, ICE Futures Europe

Primary market - CER and ERU issued ($MtCO_2$)

		Feb-14	Mar-14	Apr-14	May-14	Jun-14	Jul-14	Aug-14	Sep-14	Oct-14	Nov-14	Dec-14	Jan-15	Feb-15
Cumulative volume of CER issued UNEP-DTU (Mt)		1,433	1,440	1,451	1,457	1,466	1,472	1,480	1,491	1,504	1,512	1,512	1,525.7	
Cumulative volume of ERU issued (Mt)	Track 1 (Mt)	809.6	816.1	824	824.1	824	824.1	824.4	824.4	824.4	824.5	824.5	838.1	
	Track 2 (Mt)	25.4	25.4	25	25.4	25.4	25.4	25.4	25.4	25.4	25.4	25.4	25.4	

Sources: UNEP-DTU, CDC Climat Research

Secondary market - Prices (€/t) and volumes: EUA, CER ($ktCO_2$)

			Feb-14	Mar-14	Apr-14	May-14	Jun-14	Jul-14	Aug-14	Sep-14	Oct-14	Nov-14	Dec-14	Jan-15	Feb-15
ICE Futures Europe	Daily spot	Price EUA phase 3	6.51	6.11	5.22	5.11	5.52	5.96	6.26	6.01	6.09	6.91	6.97	6.97	7.27
		Volume EUA phase 3	21,075	35,324	49,429	19,271	20,937	11,897	5,173	17,953	5,530	7,793	10,180	9,324	25,327
		Price CER	0.36	0.19	0.17	0.12	0.14	0.16	0.17	0.15	0.13	0.08	0.04	0.46	0.42
		Volume CER	375	1,028	2,998	745	167	1,530	1	242	255	319	8,622	860	4,436
	Dec.15	Price EUA	6.91	6.41	5.46	5.50	5.80	6.16	6.44	6.16	6.21	7.03	7.15	7.06	7.35
		Volume EUA	116,329	120,993	60,524	467,135	56,911	114,684	64,504	94,922	119,746	140,392	180,590	356,677	377,226
		Price CER	0.52	0.48	0.41	0.23	0.29	0.40	0.40	0.39	0.38	0.52	0.54	0.46	0.42
		Volume CER	7,711	11,991	2,012	15,510	3,454	3,951	1,636	1,535	3,644	3,724	2,654	1,863	0
	Dec.16	Price EUA	7.26	6.76	5.7	5.50	6.02	6.35	6.62	6.30	6.34	7.17	7.35	7.17	7.47
		Volume EUA	62,380	101,196	45,597	466,631	33,286	61,189	28,171	47,533	40,921	40,926	39,009	55,893	46,588
		Price CER	0.55	0.49	0.42	0.33	0.29	0.40	0.41	0.39	0.38	0.52	0.54	0.52	0.42
		Volume CER	245	982	164	800	0	0	10	50	850	500	550	500	0
	Dec.17	Price EUA	7.26	6.76	5.7	5.50	6.02	6.35	6.62	6.30	6.34	7.17	7.35	7.34	7.63
		Volume EUA	62,380	101,196	45,597	466,631	33,286	61,189	28,171	47,533	40,921	40,926	39,009	15,087	19,340
		Price CER	0.55	0.49	0.42	0.33	0.29	0.40	0.41	0.39	0.38	0.52	0.54	0.46	0.42
		Volume CER	245	982	164	800	0	0	10	50	850	500	550	0	0

Sources: ICE Futures Europe

Emission-to-cap by EU ETS sector and country: difference between distributed allocations of allowances and verified emissions

	2008	2009	2010	2011	2012	2013
Combustion	–253.1	–113.5	–125.8	–76.9	–42.4	–137.8
Oil refining	–1.4	7.6	14.3	16.0	20.2	–36.7
Coking plants	1.5	6.8	2.9	3.1	5.7	–1.5
Metal ores	4.3	11.0	8.8	8.9	9.7	–0.2
Steel production	51.6	89.3	71.4	72.8	73.9	38.5
Cement	20.9	61.4	61.0	62.8	70.3	26.7
Glass	2.5	6.1	5.5	5.4	5.0	–1.2
Ceramic products	5.3	10.0	10.2	9.6	9.2	2.0
Paper	6.9	11.3	10.0	11.1	11.6	4.1
Other activities	0.2	4.3	1.3	–0.7	1.4	–1.0
Total (Mt)	**–161.3**	**94.2**	**59.8**	**112.1**	**164.5**	**–107.1**

Source: CITL

	2008	2009	2010	2011	2012	2013
Germany	–84.0	–36.6	–54.4	–49.5	–28.6	–106.3
United Kingdom	–50.8	–15.0	–16.8	2.5	–2.5	–52.0
Italy	–8.5	24.1	8.5	5.3	12.2	21.5
Poland	–3.1	10.8	5.9	4.2	15.6	–76.4
Spain	–9.6	13.7	29.5	18.4	17.0	31.7
France	5.5	17.5	23.4	33.9	25.2	24.8
Czech Republic	5.2	12.2	10.6	12.2	17.1	–18.3
The Netherlands	–6.8	2.8	0.1	8.9	10.5	–3.0
Romania	7.7	24.9	27.7	23.6	25.8	15.1
Others	–17.0	39.8	25.3	52.7	72.3	55.7
Total (Mt)	**–161.3**	**94.2**	**59.8**	**112.1**	**164.5**	**–107.1**

Source: CITL

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