

Green Electricity Subsidies in Bulgaria – Vectors of (re)distribution

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Abstract

Government subsidies are usually targeted to confer benefits to consumers by lowering the prices they pay or to producers by raising the prices they receive. A relatively novel application of the public sector subsidies is within the renewable energy sector. Feed-in tariffs and feed-in premiums are among the driving forces behind the recent expansion of clean electricity generation, while the CO₂ allowances allocated for free are projected to induce the conventional power plants in the new member states of the EU to invest the cost savings in environmental abatement. The current paper deals with the vectors of possible (re)distribution of the subsidies for green electricity in order to discern their progressive or regressive features in Bulgaria.

Keywords: green energy subsidies; progressive/regressive (re)distribution; feed-in tariffs; feed-in premiums; CO₂ allowances; government compensations

JEL Code: H23, Q42, Q48

Introduction

Green policy is associated with the design and implementation of instruments projected to mitigate the environmental degradation caused by the human economic activity. Having regard to previous studies, two types of green policy instruments are at the policy-makers' disposal to be chosen from. The first one encompasses the so-called "command and control" tools, while the second type consists of market-based instruments (Stavins, 2003). The ecological performance standards, fines and sanctions fall within the scope of 'command and control' domain, while environmental taxation, greenhouse gas (GHG) emissions trading, public subsidies for ecologically-friendly products and activities can be attributed to the market-based tools.

Green policy's conduct through a portfolio of diverse instruments becomes a trade mark for economic activities, which are most "indebted" to society in terms of environmental damages inflicted: the energy sector, transportation, agriculture, construction. Reducing current - and mitigating further damages have been accompanied by massive redistribution of resources, costs and benefits that affect revenue, profit and welfare of different income groups and economic activities. The vector of redistribution gains an importance as it concerns the incidence of green policy's costs and benefits. They are progressively distributed if the well-off economic agents pay bigger part of the social price (costs) than the low-income groups do. More generally, accounting for both – benefits and costs, the incidence is regressive if the net benefits increase (decrease) more than proportionally with income (Vona, 2021).

The current paper deals with the green subsidies disbursed in the energy sector in Bulgaria. Without pretending for exhaustiveness, the paper focuses on the possible vectors of (re)distribution of the public financial support in order to discern whether it is progressive or regressive. The analysis is based on the desk research method applied selectively to subsidies for clean electricity generation and greenhouse gas emissions abatement in Bulgaria.

1. The ins and outs of the energy subsidies – a brief literature review

Energy subsidies are part of the public finance provided to producers and consumers of energy output. Governments usually make direct budgetary transfers in terms of outlays, loans, loan guarantees, grants. It is also possible for the state to forego revenue in terms of tax expenditure allocated to the energy sector as tax deductions, allowances, tax credits, deferrals, etc. Within the scope of the government support fall also indirect financial measures – setting below market prices for households, monetary estimates of non-internalized externalities etc. (IEA, 2006; OECD, 2010).

With regard to the above-mentioned variety of energy subsidies, the OECD defines them as

“...a result of a government action that confers an advantage on consumers or producers [of energy], in order to supplement their income or lower their costs” (OECD, 2005). The International Energy Agency (IEA) also shares OECD’s concept of energy subsidies. They are instrumental to “any government action that concerns primarily the energy sector that lowers the cost of energy production, raises the price received by energy producers or lowers the price paid by energy consumers” (IEA, 2006). In their definitions both institutions highlight the vector of (re)distribution of energy subsidies - the latter are targeted to provide financial support from the government towards producers and/or consumers of energy output.

Energy subsidies have been applied due to many different reasons (Osterhuis et al, 2014; van de Graaf et al, 2017). First, the former could provide benefits to people facing low income and/or energy poverty. Second, through subsidies social programs for protecting certain jobs (coal miners) become feasible. Third, producers of green electricity receive compensations for high generation costs. Fourth, subsidies boost companies’ R&D activities that may reduce costs of deploying clean technologies, on which renewables are highly dependent. Fifth, energy subsidies become instrumental in mitigating climate change and environmental degradation within the power sector.

Since governments support both conventional and renewable energy sources, it is the changing structure of the subsidies that catches the attention of international forums and academics. Their research is focused on the division between environmentally harmful and green subsidies. In 2009, leaders of G-20 point to “inefficient fossil fuel subsidies that encourage wasteful consumption”, committing their governments to phase out the latter (G-20, 2009). A bulk of research follows suit with estimates of possible savings in terms of costs, social and environmental benefits in the event the phasing out of harmful outlays proceeds. Scholars anticipate extended fiscal space, new jobs offerings, reduced greenhouse gas emissions etc. (Coady et al., 2019; Juwell et al., 2018; Gerasimchuk et al., 2017; Merrill et al. 2017; Coady et al., 2015). Inspired by the magnitude of savings from restructuring of energy subsidies, researchers raise the concept of a swap. It constitutes a new vector of (re)distribution, which is compliant with the process of energy transition. The cost savings from fossil fuel subsidies’ cuts are projected to be redirected towards funding renewables’ energy expansion (Bast et al., 2015; Zinecker et al., 2018; IISD, 2019).

The restructuring of the energy subsidies can be observed in the EU-27. Throughout the period 2015 – 21 the member states’ governments spent on energy support between EUR 159 bln. and EUR 184 bln. in total. Out of the latter EUR 70 bln. (2015) to EUR 81 bln. (2020) are devoted to renewable energy expansion. The green subsidies still account for 44% of the total energy disbursements with this share remaining constant during the period in consideration. The largest green subsidies have been disbursed in form of feed-in tariffs and -premiums to incentivize clean electricity production. Their amount rises slowly – from EUR 55 billion in 2015 to EUR 63 billion in 2020¹ (Enerdata and European Commission, 2022). Feed-in-tariffs (FITs) and -premiums constitute the main driving forces behind expansion of green power generation in the Community, making its business model attractive and sustainable for more than two decades.

The green energy subsidies disbursed by the public institutions set the scene for welfare (re)distribution among different social groups. The financial incentives paid in form of FITs and premiums applied in majority of the member states are funded by imposition of high electricity surcharges. They are paid by households and other end-customers via their regular energy bills, thereby compensating clean energy producers. Hence, this redistribution vector is regressive as it leads to significantly higher burden of green surcharges placed on lowest-income households and individuals (Groesche et al., 2011; Neuhoff et al., 2013; Boehringer et al., 2017).

In 2000 a surcharge was introduced in Germany in order to provide funding for the so-called ecological electricity output. According to the German public grid - and competition regulators, the surcharge contributed for green power’s price increase from €0,0248/kWh (2006) to €0,0931/kWh (2020) for residential customers consuming on average 3500 kWh/year. In Spain the similar

¹ Figures for 2021 still missing.

surcharges were imposed on the clients' energy bills. Their burden is projected not to fall until 2030 due to life-time support for renewables in this country. The latter causes electricity prices for households to double and to two-thirds increase for medium-sized enterprises (Boehringer et al., 2021).

While FITs and premiums place high burden on domestic customers, the regressive feature of the distribution vector continues to concern academics. The owners of large photovoltaic and onshore/offshore wind farms are usually capital-intensive companies with high ability to pay (utilities, firms from construction and agriculture, retail chains) and private equity funds whose ultimate investors are high net worth individuals/families (Groesche et al., 2011). The well-off owners of renewable power plants are also eligible to receive FITs and premiums given that long-term contracts for electricity generation and supply are concluded and enforced. The regressive incidence of green subsidies is restricted, though, having regard to energy-intensive and export-oriented businesses. In the event that these "industries cannot pass on additional cost of [clean] policy reforms through higher prices [downward the supply chain], they will face negative effects on output" (Boehringer et al, 2022). Without explicitly citing, it is the high price elasticity of demand, which exposes energy-intensive and export-oriented firms to rising cost inefficiency and shrinking output. Under the surging electricity prices since mid – 2021 energy-intensive and export-oriented enterprises are at the top of the list of beneficiaries eligible for compensations. Thereby these industries are able to pass on their high energy costs toward the taxpayers who ultimately pay the bill.

2. Subsidies for green electricity output – in the labyrinth of preferential prices, premiums and compensations

Energy transition and environmental protection rank high on the policy agenda of the EU. By the time G-20 committed itself to restructure energy subsidies by phasing out the fossil fuel ones, the Community adopted Directive 2009/28/EU with the long-term target of 20% share of green energy in the final energy consumption by 2020. Following the subsidiarity principle, the member states of the EU set their national targets with Bulgaria aims to achieve a 16% share of clean energy by 2020. Still in 2016 the latter is 18,8% and in 2020 – 23,6% (NSI, 2022). Bulgaria's good performance can be explained by the financial incentives adopted and implemented in this country. Their design was taken as a good practice from Germany and adapted domestically (Georgiev, 2018). Any unit of clean electricity produced is paid at feed-in tariffs (FITs), which are administratively set above the market prices. The FITs remunerate clean power providers in the long-term as the contracts are concluded for 10-12 years ahead in the future. For the contracts' duration the public electricity supplier – the National Electricity Company EAD, and the end-suppliers are obliged to buy the whole output of green power at the generous FITs.

With regard to the clean tech deployment in the energy sector, a 10-20 years period with preset prices, artificially kept above the equilibrium ones, tends to block the liberalization of the market. The outcome is a large amount of green power generated, with rising costs for the public supplier which suffers persisting financial losses and high indebtedness (Staykov, 2016).

In order to fund the public subsidies for clean electricity output, all end-customers in Bulgaria are also obliged to pay a surcharge, i.e. the so-called "Obligations to society". It constitutes an additional layer within the price structure per kWh (MWh) of power consumed. The biggest part of the "Obligations to society" consists of "green" and "brown" payments, projected to compensate producers of green electricity and combined heat and power plants (CHP) as well the public supplier. The surcharge is due by households and businesses in this country. The former accounted for electricity price increase from BGN 0,04/kWh (2015) to BGN 0,02/kWh (2020) (KEVR, 2020). In the course of peaking electricity prices since mid-2021 the "Obligation to society" surcharge has been abolished after more than a decade of application. Thanks to the cost savings from the latter, the electricity price for households was raised just by 3,4% (KEVR, 2022). This regulatory decision will mitigate the long-term regressive incidence of the "Obligations to

society” surcharge.

The currently applied framework for energy producers’ remuneration tends to revise past mistakes and deficiencies committed, while conducting policy for clean electricity promotion. Its design becomes more sophisticated as the financial incentives depend on the amount of installed capacities by the energy producers. Hence, companies that own and operate power stations with a total installed capacity of more than 500 kW of green electricity and combined heat and power (CHP) are remunerated by premiums, while those with less than 500 kW - receive feed-in tariffs (Energy Sector Act, Art. 162, Art. 162a, Art.33, Art. 33a; Energy from Renewables Sources Act, Art. 31).

The revised remuneration framework is devised in a manner to better segment possible beneficiaries, preventing public subsidies from regressive distribution and absorption. Since 2019, producers with capacity of more than 500 kW are obliged to sell their output on the Independent Energy Exchange platform, being remunerated via premiums, which are the difference between feed-in tariffs and market prices. Hence, if the latter are bigger than the former, the large clean electricity projects are not eligible for premiums. Feed-in tariffs still apply to clean power output generated by projects with installed capacity of less than 500 kW.

The public subsidy in terms of feed-in tariffs and premiums has been disbursed through the extra-budgetary fund “Security of the electricity system” (“SEES”). In financial terms, the latter is crucial for the integrity of the power system in Bulgaria. Figure 1 below presents the amounts of public subsidies that have been allocated in support of the green – and combined heat and power production in this country. The period 2015-2021 encompasses the time when the extra-budgetary fund was set up (mid-2015) and its first years of operation.

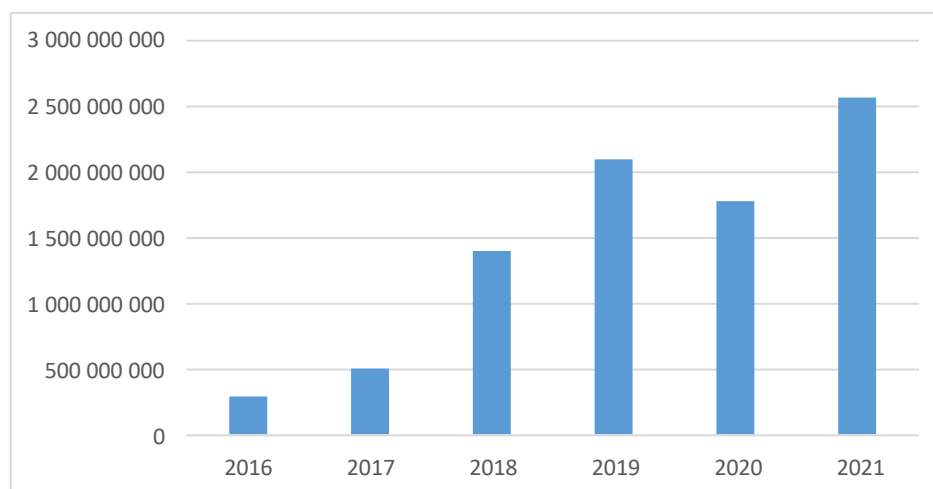


Figure 1. Public subsidies for green electricity and CHP (2016-2021) (in BGN)

Source: Fund „Security of the electricity system”

The financial resources disbursed grow steadily throughout 2016-19, when more than BGN 4 billion in total were paid as feed-in tariffs and premiums. The COVID-19 pandemic temporarily restricts the demand for and supply of electricity in 2020. Though, in spite of the almost collapsed economy in the first half of 2020, the public outlays for green power generation are BGN 1,5 – BGN2,0 billion.

In the course of peak energy prices persisting since mid-2021, the power stations operating on renewables and the CHP plants generate large amounts of revenue and profits by selling their energy on the liberalised market. Despite the favourable constellations in the second half of 2021, the financial support is not discontinued and even reaches its maximum of more than BGN 2,5 billion. With regard to the turbulent time, a more comprehensive analysis of the public subsidies paid in 2021 is worth making.

Table 1. Quarterly distribution of public subsidies for clean and CHP electricity producers in 2021 (in mln. BGN)

	1st quarter	2nd quarter	3rd quarter	4th quarter
Subsidies disbursed	107,3	615,8	631,9	1212,0

Source: Fund “SEES”

The data in table 1 show an uneven pattern of distribution of the feed-in tariffs and premiums remunerating green power – and CHP plants throughout 2021. In the second and third quarter the “SEES” disbursed more than BGN 600 mln., while in the last quarter the payments almost double. Public subsidies for electricity producers are justified in the first half of 2021. On the background of high windfall profits from transactions on the free market in the second half of 2021 the clean electricity producers still receive more than BGN 1,8 billion in terms of financial support from the public sector. This vector of distribution seems to be quite regressive.

Care should be taken, though, considering the amounts paid in the last three months of 2021. Since October, the fund “SEES” has been administering a state compensation scheme targeted to businesses, schools, universities, theatres etc. The scheme is set to reimburse latter’s rising energy costs. Though, from the official data provided by the fund “SEES” it is not clear-cut how much of the amount of BGN 1 212,0 mln. has been paid as feed-in tariffs/premiums and how much for compensations to non-domestic customers.

Fig.2 below juxtaposes the fluctuations of two variables – the market price/MWh and the compensation/MWh of electricity the government has provided via its scheme to institutional and business clients.

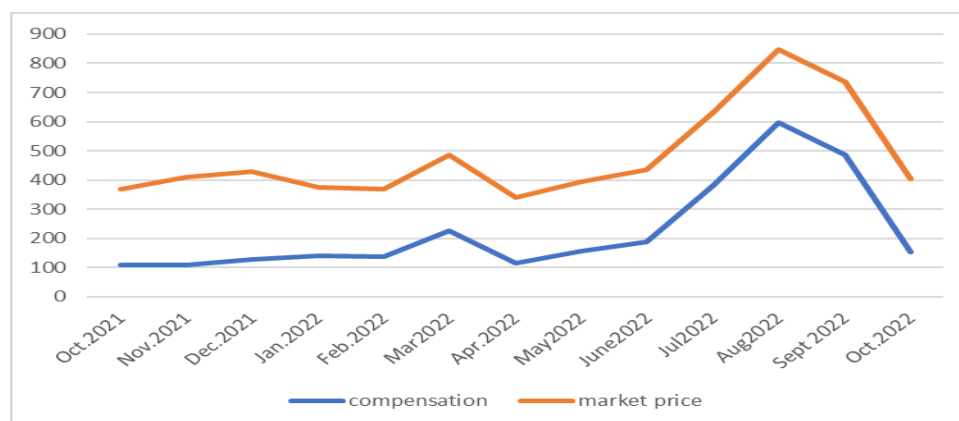


Figure 2. Market prices and compensations per MWh of electricity output in Bulgaria

Source: Bulgarian Independent Energy Exchange and Ministry of Energy.

The bottom line shows monthly fluctuations of compensation/MWh in Bulgaria. It ranges between BGN 100 initially and BGN 600 in the summer of 2022. The gap on fig.2 shows the amount of the energy costs that any firm has to cover from its corporate finance. Both lines are parallel as the compensation per MWh provided by the government is proportional to the difference of the following two amounts. First, it is the average monthly price for electricity achieved on the segment “Day ahead” of the energy exchange (the upper line on fig.2). Second, it is the so-called basis price per unit of power output. The latter is set by the government – at BGN250 until the end of 2022 and at BGN200 for the upcoming 2023 (Ministry of Energy, 2022; Parliament, 2022). In addition, since July 2022 (when the new regulatory period begins) the non-domestic clients receive 100% of the difference compensated by the government. As the basis price is projected to fall from BGN250 to BGN200 in 2023, the government is set to provide even more generous financial support to non-domestic customers.

The issue at stake, though, is not about the generosity of compensation scheme per se. What matters, is the regressive vector of its distribution and absorption among beneficiaries. Since all non-domestic customers are eligible for compensation, the highest energy cost savings would be appropriated in a regressive manner - by the large companies from the industry and service sector. Moreover, there is no mechanism yet to monitor and control whether the firms have passed on their energy cost savings to the households. Therefore, it is realistic to conclude that businesses will continue to receive ever rising compensations for the energy cost, while further raising prices of their output and inducing inflation in this country.

A relevant factor, capable to mitigate the regressive vector of distribution of the energy compensations, is the source of their funding. The compensation scheme has relied so far on the windfall profits, which the large state-owned energy enterprises earn in the course of high electricity prices. At the same time, private companies engaged in electricity generation and supply have retained their profits, despite peaking prices on the non-regulated market equally favor both state-owned and private firms. Therefore, the non-neutral way of funding provided to the compensation scheme has to be revisited and revised towards widening contributors' scope. The windfall profits of private electricity producers and suppliers should also be redistributed to fund the compensations for high energy costs. Thereby, the funding design should contribute to 1) *neutral* windfall profits taxation despite their ownership constellations and 2) *solidarity* payments. *Neutrality and solidarity* are equally important features that would mitigate the regressive vector of allocating the compensation payments for businesses and other institutional customers.

3. CO2 allowances-for-environmental abatement program – mission impossible

Regressive vector of energy subsidies' distribution has got also its supra-national projection. Aspiring the leadership in climate change mitigation, the EU institutions initiated and supported the biggest exchange for CO2 allowances in the world. By the time this innovative type of trading scheme started, the policy-makers searched an appropriate mechanism to attract the stakeholders affected to the clean environment cause. Therefore initially, the design of the EU - Emission Trading Scheme (EU-ETS) relied on assigning CO2 allowances *for free*, i.e. the so-called mechanism of *grandfathering*. It favors mainly capital-intensive firms with high ability to pay that own and operate polluting installations throughout the EU/Europe. The companies covered by the EU-ETS usually come from the energy sector, steel -, chemical, cement-, glass-, paper pulp - and paperboard industries.

After 2012, within the second period of the EU-ETS' operation, firms from the conventional energy sector retain the grandfathering privilege extending it till 2020. The eligible companies are located in the new member states – Bulgaria, Romania, Poland, Czech Republic, the Baltic countries. The CO2 allowances allocated gratis constitute in fact public subsidies that favor the large energy companies with their coal- and gas-fired power plants. The CO2 allowances are assigned in compliance with the EU Directive (Directive 2003/87, Art. 10c, §5). The generous public support is approved by the supra-national institutions and is allocated after a notification procedure with the European Commission. The former requires that the polluting power plants receive a *conditional* state aid. In exchange of CO2 allowances, received following *grandfathering*, the conventional energy companies are obliged to build up financial reserves. In the period 2013-20 the latter is set to be invested into environmental abatement measures in the regions, where polluting power plants operate.

The derogation provided in the Directive 2003/87/EU favors “new” member states with lower GDP/capita, which means that the grandfathering of CO2 allowances is set to follow a progressive vector of distribution. Though, the latter is distorted within the national member state. Throughout 2013-20 Bulgaria is assigned gratis CO2 allowances that amount to €945 038 235 (ME, National Investment Plan). They are allocated among 28 eligible installations in the energy sector which receive in total 54 168 005 allowances.

The biggest three beneficiaries in terms of CO2 emission allowances in this country are the

conventional power plants in the Maritsa basin. The private enterprises “Maritsa Iztok-1” and “Maritsa Iztok-3” receive €225 093 665 (23,8%) of the total amount allocated for free, while the state-owned “Maritsa Iztok -2” - €274 379 123 (29,0%) (National Investment Plan). The statistical data shows that there is a concentration of financial aid targeted to the biggest three power plants, which belong to multinational -and large domestic companies. They save in total €0,5 bln. from their corporate finance due to the regressive vector of state aid allocation. Despite the generous financial support, the pollution in the region of Maritsa basin is not restricted yet. It is the reason that the Court of Justice of the EU held that Bulgaria committed a breach to the EU law in persistently exceeding the daily and hourly norms of sulphur dioxide. In its judgement on the case, the Court of Justice of the EU found that Bulgaria failed to protect the South Eastern part of the country and the region of Galabovo and Dimitrovgrad, in particular, from high harmful gases’ emissions from 2007 to 2021 (C-730/19).

Having regard to the distribution of state aid in terms of gratis CO2 emission allowances, some conclusions appear important to be highlighted. First, more than half of the state aid amount assigned to Bulgaria has been distributed from 2013-20 among the three conventional power plants, resp. their mother companies. Second, the cost savings in acquiring these assets, do not contribute to improving the air quality in the region of power plants’ operation. Third, the period considered in the recent judgement of the Court of Justice seems long-gone, though, the regressive practice of state aid provision is still valid.

The public sector still pays higher prices for the electricity output of both private power plants “Maritsa Iztok - 1” and “Maritsa Iztok - 3”, which is a consequence of the long-term contract concluded by the time the coal-fired enterprises were privatized. According to the state-owned enterprise “Maritsa Iztok – 2”, the privatization contract’s clauses harm the competition on the electricity market. The government (via the Natsionalna Elektricheska Kompania EAD) still buys the whole output of both private power plants at preferential prices, while also covering their expenditures for buying CO2 allowances (Interim individual report on activity, 2021).

CO2 allowances assigned for free did not contribute to improved financial performance of the state-owned enterprise too. Throughout 2013-20, the “Maritsa Iztok - 2” accumulated a large amount of financial loss. By mid-2021 (prior to surging energy prices) it amounted to more than BGN 0,5 billion (Interim individual report on activity, 2021). In order to partly cover the loss, in 2019 the Electricity and Water Regulatory Commission adopted a new component included in the electricity price/bills paid by the end-customers. The new component is added on top of the “brown” and “green” surcharges and led to further price increase. The “Maritsa Iztok - 2” component ranged between 60% (2019) and 73% (2021) of the “Obligations to society” charge (KEVR, 2021).

The operation of the EU-ETS within the energy sector in Bulgaria provides evidence in favour of regressive distribution and appropriation of the generous state aid provided. It distorts competition not only in terms of “small-large power plants”, but also across the large ones and their mother companies. Moreover, the polluter pays principle becomes distorted obtaining regressive feature. It turns out that Bulgaria keeps paying large companies and their domestic subsidiaries not to abate, but to continue to pollute the environment.

Conclusion

The amounts of public subsidies disbursed as feed-in tariffs and premiums tend to favour producers of clean energy with large installed electricity capacity and high ability to pay. On the background of surging energy prices, the on-going subsidisation from the extra-budgetary fund “Security of Electricity System” constitutes economic non-sense. The compensation scheme provides generous public support to all non-domestic customers with no warranty that the cost savings would be passed on to households, thereby taming inflation. There is much evidence that state aid in terms of billions of Euro is absorbed by the three largest enterprises in the conventional energy sector, while the air pollution emitted still damages public health and the international

reputation of Bulgaria. The regressive public subsidies generously allocated in the energy sector and the Court of Justice's intervention do not contribute to green policy's attractiveness in Bulgaria.

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