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The EU Emissions Trading System in Crisis-Ridden Greece: Climate under Neoliberalism

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Abstract

Neoliberal capitalism has extended the use of markets to address climate and energy issues. Carbon trading characteristically exemplifies the neoliberalization of climate policy. This paper discusses the workings of the European Union's Emissions Trading System (EU ETS) in the European Union (EU) with a focus on its application in crisis-ridden Greece. Beyond environmental effectiveness and distributional effects, the paper explores the interactions of the EU ETS with crisis, austerity programs, energy poverty, and uneven development. Despite adjustments and changes, the EU ETS continues to indicate limited environmental effectiveness and unjust distributional effects. Moreover, by forging a centralized neoliberal transition to a low-carbon economy without consideration of the issues faced by unevenly developed and crisis-stricken EU members such as Greece, the EU ETS leads to additional disturbances and problems for the Greek economy as a whole, its pauperized working people, and its energy and climate options to reduce emissions on its own potential, needs, and priorities.

JEL Classification: B5, P1, Q5

Keywords

political economy, neoliberalism, climate change, EU emissions trading system, Greece

1. Introduction

The European Union's Emissions Trading System (EU ETS), the flagship of the European Union (EU) climate policy, was established under the influence of neoliberalism. It was launched under the provision of the international flexible mechanisms of the Kyoto Protocol (KP), which signify the emergence of neoliberal thinking in climate issues.

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Instituted by Directive 2003/87/EC, the EU ETS established an integrated EU market for greenhouse gas (GHG) emissions permits. It was rationalized in terms of cost-effectiveness and flexibility to meet the EU GHG reduction targets. The price of emissions allowances would provide polluters with incentives to invest in free- or low-carbon technologies and energy efficiency.

The scheme was designed to run for two phases, phase 1 (2005–2007) and phase 2 (2008–2012), which coincided with the first commitment period of the KP. Predicated on the KP, the future of the EU ETS was critically conditioned by the lifespan of the former. However, efforts to reach a new, legally binding international climate agreement after 2012 failed in Copenhagen in 2009. UN negotiations, nevertheless, continued with the hope of reaching a new agreement, which would enter into force in 2020.[1] In the meantime (2013–2020), 38 developed countries, including the EU member states, agreed to participate in a second Kyoto period running from 2013 to 2020. The necessary amendments to the KP were adopted at the Doha conference in December 2012. A reduction of at least 18 percent from 1990 levels by 2020 was set as a target. The EU set a target of a 20 percent reduction from 1990 level; this was part of the "climate and energy package" (20-20-20) adopted in 2009.[2] The continuation of EU ETS in its third phase was enabled by these developments.

Greece, as a member of the EU, was obligated to transpose the 2003 ETS directive into Greek Law. Greece, however, was able to adapt to the EU ETS only with difficulty. It was (and still is) a small, less developed country within the EU (consisting of 15 members at the time [EU-15]), with quite a different economic and energy system from that of the more developed member states. In 2001, when the ETS scheme was proposed, the per capita GDP of Greece was 50.3 percent of the average per capita GDP of the EU-15. Moreover, the per capita final energy consumption of Greece was 65 percent of that of EU-15 on average (OECD/IEA 2003).[3] These figures indicate the uneven development of Greece in the EU-15 and, consequently, its asymmetrical vulnerability to an economic crisis. When Greece entered the Eurozone in 2001, the country was exposed to risks of getting deeper into economic imbalances; these risks were intensified by the unsound Eurozone architecture and the subsequent increased inability of the country to initiate independent national policies (Lapavitsas et al. 2010; Vlachou and Christou 1999; Vlachou, Theocarakis, and Milonakis 2011).

The structure of the energy balance in Greece was critical for the application of the EU ETS. Significantly, primary energy production was heavily dependent on solid fuels (84 percent of the total in 2001), based mainly on lignite. Final energy consumption in Greece consisted mainly of oil (69.3 percent) and of electricity (19.1 percent) in 2001. The use of natural gas in Greece was very limited both in primary production and in final energy consumption. For comparison, for the same year, final energy consumption in EU-15 was primarily composed of oil (50.3 percent), electricity (18.5 percent), and natural gas (22.6 percent) (OECD/IEA 2003).

Significantly, Greece was also heavily dependent on imports of energy, which made its economy vulnerable to instabilities in the world energy market. In particular, the dependence of Greece on energy imports was overall 67.4 percent in 2003; it was higher for oil (96.1 percent) and for natural gas (98.8 percent) but significantly lower for solid fuels (4.7 percent). For comparison, the dependence on energy imports of EU-15 was overall 51.8 percent in 2003; it was

[1]Albeit not the kind of agreement that many hoped, such an agreement was accomplished at the Paris conference in December 2015.

[2]The second KP applies to only around 14 percent of the world's emissions. See European Council "International Agreement on Climate Action" at http://www.consilium.europa.eu/en/policies/climate-change/international-agreements-climate-action/, accessed June 20, 2018.

[3]Greece accounted for only 1.9 percent of the total final energy consumption of EU-15 in 2001, while Germany accounted for 23.0 percent and United Kingdom for 15.1 percent (OECD/IEA 2003).

higher for oil (79.2 percent) and for solid fuels (55.1 percent) but lower for natural gas (49.2 percent) (European Commission [EC] 2006: 30).

In short, when the EU ETS was initiated, Greece was more vulnerable than the EU-15 on average in terms of the carbon content of its energy system, energy safety, and also in terms of economic growth and living standards. By 2016, Greece entered the eighth year of a deep economic crisis, implying that the second and the third phases of the EU ETS run amidst a serious recession and harsh austerity programs, which have accelerated the neoliberal transformation of Greek economy and its appropriation of nature (Konstantinidis and Vlachou 2017, 2018,).

In this paper, we build upon previous work (Vlachou 2002, 2005, 2014; Vlachou and Konstantinidis 2010; Vlachou and Pantelias 2017a, 2017b) to investigate the workings of the EU ETS with a particular focus on its application in crisis-ridden Greece, from the standpoint of a critical political economy of the environment and energy, inspired by Marx (1976, 1991). The analysis grounds the EU ETS in neoliberal capitalism, a class society, driven by profit and propelled by competition at global scale, resulting in uneven development and ecological hazards. By focusing on the workings of EU ETS in Greece (with emphasis on its ongoing phase 3), we extend our previous critical understanding of the scheme with novel elements: its relations to crisis, austerity programs, energy poverty, and uneven development, as well as its forging a centralized and inattentive (to national asymmetries) transition to a low-carbon economy for unequal EU partners. Our analysis substantiates that the EU ETS is not only an environmentally ineffective scheme, but it is also an antiworking class endeavor, undermining the much-needed support by the majority of the people for a low-carbon transition.

In the next section, we discuss nature and, in particular, climate under capitalism and its neoliberal transformation as the basis for the emergence and shaping of the EU ETS. In the third section, we discuss in brief the basic features of the EU ETS. We also discuss and evaluate the main results of its running in the first two periods to establish the environmental ineffectiveness and injustice of the scheme. In the fourth section, we investigate the third phase of the EU ETS in EU and Greece, with a critical focus on distinct troubling outcomes in Greece in the years 2013 to 2016. Despite the adjustments, the analysis reveals deep-seated pitfalls and class biases of the scheme. In the last section, some concluding remarks are offered.

2. Neoliberalism and Climate

Current policies to mitigate climate change (CC) are shaped by the neoliberal turn of capitalism and are deeply related to the present forms of surplus value extraction. In particular, climate conditions sustain natural resources and conditions needed by capitalist firms in requisite quantities and qualities for their profit-making activities in contemporary capitalism (Burkett 1999; Harvey 1999; Konstantinidis and Vlachou 2017; Resnick and Wolff 1987; Vlachou (2002, 2005). Moreover, humans meet nature from the inside (see also Moore 2015: 14). In particular, climate conditions sustain human life and, for that matter, they provide elements that are necessary for the reproduction of labor power bought as a commodity by capital, thus taking part in the determination of the value of labor power (Marx 1976: 274–6; Vlachou 2002, 2005).

Pollution, CC, and natural resources exhaustion (fossil fuels included), as well as measures to contain them, result in adverse effects on several capitalist firms and working people, which will (at least in part) register as increases in costs, values, and prices, resulting in changes in profits, rents, and wages (Marx 1976: 129–30, 1991: 779–97; Vlachou 2002, 2005).

Various conflicts, tensions, and changes can be instigated between GHG emitters and various victims of CC because of its negative impacts. These multiple struggles give rise to national and international policies to mitigate CC. In particular, the intercapitalist struggle or competition among capitals and the struggles taken up by the working and ecological movements play an important role in the shaping of environmental regulation (see also Vlachou 2004, 2014; O'Connor 1998; Kenis and Lievens 2016). In the international arena, historical accountability for CC fuels the conflict over climate policy between developing countries and developed ones (Schor 2015; Vlachou and Konstantinidis 2010).

The state is called upon by the above-mentioned social agencies to secure natural conditions and to mediate conflicting claims over natural resources. The state secures multiple conditions for the completion and renewal of the circuit of capital and, more generally, the reproduction of capitalism as a class society (Harvey 1999; O'Connor 1998; Resnick and Wolff 1987; Vlachou and Maniatis 1999). The state may implement environmental and energy regulation to discipline economic activity that generates damaging outcomes, such as CC (Vlachou 2005). The direction of state climate and energy policies is largely an outcome of struggles waged by working people and capital at the economic, political, and ideological level, and their relative strength over access to global natural resources and conditions at both the national and international levels (Kenis and Lievens 2016; Vlachou 2004, 2014; Vlachou and Konstantinidis 2010).

At the international level, climate and energy conditions and policies are shaped by *uneven* capitalist development, which lies in extraction and accumulation of surplus value and responds to competition (Weeks 2001). Capitalist competition among companies, in its many forms, results in firms, industries, regions, and economies developing at an uneven pace. Accordingly, capitalism gives rise to an *uneven* appropriation of natural resources and conditions in terms of spatial and temporal dimensions (Harvey 1999; O'Connor 1998). The struggle between the competitively disadvantaged and advantaged (and its results) gives rise to contradictory tendencies that are inclined to produce both divergence and convergence, with relevant implications for the contradictory appropriation of nature (see also Harvey 1999: 415–7).

The appropriation of nature and natural conditions has been reshaped in the neoliberal phase of capitalism. Launched first in the UK and the United States, neoliberalism spread globally. Financial markets and, in particular, Washington institutions (the World Bank and International Monetary Fund [IMF]) played a major role in this process, by imposing neoliberal policies as conditionalities for aid or debt relief to countries close to default (Fine and Saad-Filho 2014; Harvey 2006; Konstantinidis and Vlachou 2017).

Neoliberals claim that the market offers an optimal mechanism for the coordination of individual economic activities, as well as solutions to various economic or environmental problems. At the macroeconomic level, they privilege price stability over full employment goals, as well as the use of "free market" adjustments to achieve growth and stability. Neoliberal restructuring also includes the privatization of enterprises and resources that were previously state- or communally owned; the deregulation of economic activity, as shown, for example, by "liberalized" energy markets; and the commodification and deregulation of natural resources and conditions as shown by "free market environmentalism" (Kenis and Lievens 2016; Konstantinidis and Vlachou 2017). Neoliberalism also involves the increased internationalization of capital, exemplified by the increased abolition of obstacles to the free movement of capital across national borders. Its most pronounced new characteristic is the increased role of finance ("financialization") (Fine 2006; Fine and Saad-Filho 2014; Konstantinidis and Vlachou 2017; Vlachou and Christou 1999).

Neoliberal rudiments, as described above, were inscribed in the formation of new European institutions, such as the EU and the Economic and Monetary Union (EMU), and came to shape EU energy and climate policy and EU ETS, in particular.

Under neoliberalism, nature is appropriated and commodified in new diverse ways. Neoliberalism "has included, and perhaps even depended upon, the incorporation of many new elements of non-human 'nature' into the circuits of capital"—"most notably through extensive new forms of enclosures and dispossessions"—"and, conversely, the extension of market rationalities and techniques to environmental governance and politics" (McCarthy 2015: 4–5). Neoliberal capitalism has extended the use of markets to address issues such as environmental pollution, CC, and resource conservation (Castree 2008; Lohmann 2006, 2015; Vlachou 2005; Vlachou and Konstantinidis 2010).

With increasing financialization, natural resource and ecosystem service commodities (with assigned private property rights) have been often highly financialized; the price of natural asset titles is "generally fixed by the present and anticipated future revenues capitalized at the going rate of interest" (Harvey 1999: 276–7; Vlachou and Pantelias 2017a, 2017b).

The KP of 1997 epitomizes the neoliberal dominance on climate analyses and policy. While preserving the conventional policy instruments, it adds new ones (the flexible mechanisms), which come to play a key role in actual climate policy. In particular, the KP introduces joint implementation (JI) of projects to reduce emissions in an Annex I party (an industrialized country with a Kyoto commitment); it establishes the clean development mechanism (CDM) for projects in non-Annex I countries (i.e., countries without national commitments), and it allows (Kyoto) emissions trading (KET) among Annex B parties (Annex B includes Annex I parties with emissions limitation targets). KET is "a cap-and-trade system." Under these schemes, an investor country receives emissions reduction units (JI-ERUs) or certified emissions reduction units (CDM-CERs), which can be used to comply with their national commitments. ERUs and CERs are traded in carbon markets as they are linked with the KET and the EU ETS, as discussed below (Vlachou 2014; Vlachou and Konstantinidis 2010). The Kyoto flexible mechanisms were particularly crucial for neoliberalizing conceptions and responses to CC (including EU ETS) in advanced capitalist countries as well as in less developed ones. In fact, emitting companies had long been engaged in promoting international emissions trading (ET). The KET scheme was directly and indirectly influenced by the private initiatives of emitting (mainly energy) companies aiming at securing their high profitability while complying with the Kyoto targets (Hoffman 2004; Vlachou 2014).

The reign of neoliberalism is evidenced in various facets of the current EU environmental and natural resource policies. For instance, resisted by large GHG emitters, a harmonized EU carbon tax was not approved in the early 1990s (for a discussion, see Ikwue and Skea 1994). Instead, an ET system was favored (Vlachou 2014). In the energy sector, the prioritization of the EU internal energy market imposed the deregulation of the energy markets and the privatizations of publicly owned energy companies and thus opened the sector to private capital (International Energy Agency [IEA] 2014; Konstantinidis and Vlachou 2017; Vlachou and Maniatis 1999).

Shaped under the influence of intracapitalist struggle, neoliberal EU energy and climate policies tend to incorporate several elements of non-human nature into the circuits of capital. In particular, climate and energy issues are increasingly seen as an opportunity of change and growth, thus resulting into an "early-mover advantage" when firms compete in international markets. The policies for the transition to a low-carbon economy might offer an opportunity for growth for the highly competitive industrial firms of the United States and of advanced EU countries (Kenis and Lievens 2016; Vlachou 2004). Germany, in particular, has set off to establish a competitive advantage in low-carbon technologies: in 2013, 752 companies and research organizations based in Germany filed 3,156 patents in low-carbon energy technologies, accounting for 48 percent of the EU total (EC 2017c: 20).[4] With respect to the competitiveness of its wind and

[4] 2013 is the most recent year for which complete patent statistics are available. The filed patents concentrated on sustainable transport (40 percent), followed by efficient systems (21 percent) and renewables (21 percent) (EC 2017c: 20).

solar energy: “Germany is performing well in the wind sector due to a comparative advantage in key components of the wind energy industry such as generating sets, gearboxes and power electronics. Germany is also performing well in the solar sector as indicated by the revealed comparative advantage indicator…. This is due to a comparative advantage in the manufacturing of silicon and power electronics” (EC 2017c: 22).

However, a flourishing Germany, attracting financial capital from all over the EU and thus capable of financing its path to a low-carbon transition at a low financial cost, is the opposite side of struggling crisis-ridden southern EU countries, including Greece. Given the long-standing economic asymmetries among EU countries, the neoliberal energy and climate policies have a tendency to widen the uneven development of vulnerable EU economies, with negative implications for the environment, energy, and natural resources as evidenced in Greece in recent years (Hadjimichalis 2014a; Konstantinidis and Vlachou 2017, 2018). Public debt was particularly crucial for extending neoliberal policies outside the global North, imposed as conditionalities for aid or debt relief by the World Bank and IMF (Harvey 2005; Swyngedouw 2005). These conclusions hold true for less developed countries within the EU as the case of crisis-ridden Greece exemplifies (Hadjimichalis 2014a, 2014b; Konstantinidis and Vlachou 2017, 2018; Vlachou 2012).

The above theoretical framework helps us locate the EU ETS within the neoliberal turn of capitalism, globally and EU-wide. Moreover, it helps illustrate how this major EU climate policy apparatus has accelerated the neoliberal restructuring of CC management in EU and Greece, ongoing since the early 1990s, at the expense of working people and the unprivileged.

3. The Basic Design of the EU ETS and Its Main Outcomes in the First Two Phases

EU ETS originates under the auspices of the KP. The EU agreed to reduce its emissions by 8 percent on average from their 1990 level for the period 2008 to 2012. To do so, it established a joint commitment for its members and in 2002 reached the *Burden Sharing Agreement,* which assigned different reduction targets per member state. This agreement enabled the EU to take into account, albeit to a limited degree, differences in economic structures and reduction potentials of its member states. As a result, less developed countries were permitted to increase their emissions, for instance, Greece, by 25 percent.

To meet its commitments under the KP, the EU set up an emissions permits system. The EU ETS established an internal EU market for GHG emissions allowances on arguments of efficiency and flexibility (Berta, Gautherat, and Gun 2017; EC 2003; Vlachou 2014). The scheme was first designed to run for two phases (2005–2007) and (2008–2012), and was extended, albeit in an amended form, to a third phase in tandem with the Doha 2012 agreement instituting a second Kyoto period 2013 to 2020. Over the first two trading periods, the scheme initially covered only CO_2 emissions; however, limited extensions to other GHGs were introduced in phase 2. One emission allowance (European Union Allowance [EUA]) gave the holder the right to emit one metric ton of CO_2 (tCO_2); provisions for transforming other GHG emissions into equivalent CO_2 emission units (tCO_2e) were included in the scheme from its outset.

In the EU ETS, the limit on the total number of allowances creates scarcity in the carbon market. Member states issue emissions allowances, which amount in total to the approved cap, and allocate them to participating plants. The participants can then engage in emissions allowances trading to fulfill their commitments in a cost-effective way. They can also use, albeit to a limited extent, KP credits (CERs and ERUs) for compliance. In such a cap and trade system, an allowance to emit CO_2 or GHG is a “commodity” based on de facto (although temporary) property rights over the earth's capacity for carbon cycling (Lohmann 2009a, 2009b; Vlachou 2014). Banking and borrowing of allowances were permitted only within the first phase and within the second one, but not between the first and the second trading periods. For the second and subsequent phases banking is allowed between periods but borrowing is not.

The ETS covered the emissions of large emitters from the power and heat industry and certain sectors of energy-intensive industries. As of May 2008, the participating installations amounted to 11,186 plants. Important sectors such as transport and aviation (until 2012) were left out from the first two phases of the scheme. Allowances during phases 1 and 2 were mainly given free of charge (grandfathering) by the member states to the companies involved (EC 2003).[5] Member states were given discretion over the allowances allocation process. For each trading period member states developed National Allocation Plans (NAPs), which were submitted to the Commission for approval. NAPs determined the total level of ETS emissions, the allocation of emission allowances at the level of each installation in the country, and the maximum amount of JI and CDM credits to be used for compliance.

With respect to monitoring mechanisms, the ETS established a system of uniform national registries connected to the Community Independent Transaction Log (CITL). Member states reported allocations and verified emissions at the installation level to the CITL. Installations self-reported their emissions; reports were verified by an independent verifier certified by the member state. Member states ensured compliance by deducting allowances from a firm's account at the national registry, which were equal to the verified emissions of the firm.[6]

By design EU ETS allowances were intended to become a financial instrument in order to increase the liquidity of the market. Market participants in the EU ETS can trade in emissions in the form of spot, futures or forwards, swaps, and options on futures. Carbon derivatives have EUAs, CERs, or ERUs as their underlying asset, that is, their value is linked to the expected future spot price of EUAs, CERs, or ERUs (Berta, Gautherat, and Gun 2017; Daskalakis, Ibikunle, and Diaz-Rainey 2011). They are traded over-the-counter (OTC) or through exchange platforms. The former are subject to counter-party risk and are largely unregulated, while the latter reduce the risks of default through the use of a central counterparty and are regulated under financial market rules (EC 2016a).[7]

EU ETS allowances have rapidly developed into a major financial instrument. Moreover, following financial practices, carbon derivatives have started to give rise to various financial innovations (e.g., complex securitized carbon products). Secondary markets for credits were also developed, raising questions around carbon market oversight (Berta, Gautherat, and Gun 2017; Friends of the Earth 2009; Lohmann 2009a; Vlachou and Pantelias 2017a, 2017b; World Bank 2010).

The results from the running of EU ETS for the first two periods are reported and evaluated at the EU level in Vlachou (2014) and Vlachou and Pantelias (2017a, 2017b), and for Greece in Vlachou (2017). Due to space limitations, we offer here only the major outcomes.

[5]In particular, Directive 2003/87/EC required that at least 95 percent of allowances for the period 2005 to 2007 and at least 90 percent of the allowances for the period 2008 to 2012 should be allocated for free. The remaining percentage of allowances could be auctioned.

[6]The ETS has strict compliance provisions. A fine of €100 per excess metric ton of CO_2 equivalent (CO_2e) is set for a non-compliant company. For the first trading period the fine was lowered to €40 per metric ton of CO_2 equivalent to give installations time to adapt.

[7]However, under Markets in Financial Instruments Directive (MiFID), "spot transactions are not currently subject to equivalent rules at the EU level and are not supervised" (EC 2016a: 69); in the revised MiFID, or MiFID II, which applies since January 3, 2018, spot trading was defined as a financial instrument (Vlachou and Pantelias 2017b). Auctions are carried out through auctions platforms, governed by the EU ETS auctioning regulation (1031/2010).

The majority of allowances were freely allocated, raising serious equity issues. Grandfathering assigns de facto "rights to pollute" to large emitters and to highly industrialized EU countries for the time duration of the permits. Moreover, although allocated temporarily and potentially invoked back by national governments, such a system of private property rights over the earth's capacity for carbon cycling tends to affect a whole range of economic, political, and cultural relations in capitalism in order to create, secure, and police such new private assets. Significantly, it reinforces class exploitation by dispossession, while further constraining the choices of wage labor (Lohmann 2006; Vlachou 2005, 2014). Due to limited auctioning, non-regulated power companies were able to appropriate "windfall" profits by passing through the price of allowance to electricity rates. A number of mainstream empirical studies also conclude that the full cost of carbon was passed through to electricity prices in many European countries (Hintermann, Peterson, and Rickels 2016). Additionally, Point Carbon Advisory Services (2008) estimate that windfall profits in selected countries (United Kingdom, Germany, Spain, Italy, and Poland) were non-negligible.

Increased prices of electricity and other products, due to ETS compliance costs, raise issues around competitiveness. The high priority of international competitiveness is evidenced in the carbon leakage debate, which is resolved by free allocation of allowances to energy-intensive sectors (EC 2009; Vlachou and Pantelias 2017b).[8] Grandfathering was decided to continue under certain qualifications during phase 3, in order to protect industrial ETS firms from competitive disadvantage. Discretion for member states over cap-setting and allocation also raised competitiveness issues since they increased complexity and costs (including administrative and transactions costs), in a heterogeneous way.

Furthermore, increased electricity prices have negative income effects on buyers, especially low-wage earners. Establishing auctioning as the default allocation of allowances in the power sector in phase 3 would tend to prevent windfall profits but not negative distributional effects (see also Vlachou 2014; Vlachou and Pantelias 2017b).

The limited environmental effectiveness of the EU ETS is illustrated by the fact that emissions caps proved non-binding. Allowance surpluses emerged due to several reasons: failed projections; lobbying by corporations for the maximum possible number of free allowances, leading to overallocation; economic crisis and financial speculative trading; and the use of significant amounts of CERs and ERUs. When the amounts of CERs and ERUs are added to the (free and auctioned) allocated EUAs (and EUAAs), the actual total surplus of allowances increases reaching 1,903 $MtCO_2$ and accounts for 18 percent of total allocation (free and auctioned allowances) in EU-27 in 2008 to 2012 (Vlachou 2017).[9] This surplus could be banked for future use. Allowance surpluses also resulted in low EUA prices.

In the name of enhancing liquidity, ETS allowances have quickly developed into a major financial instrument, turning over billions of dollars a year. The World Bank has played a pivotal role in this development. In general, financial institutions (particularly large banks) became involved in carbon trading (especially in OTC) in order to collect fees from expanding transactions and later to trade for profit (Vlachou and Pantelias 2017a, 2017b). This quick and poorly regulated financialization involved destabilization dangers. In the course of financial turmoil, a large sell-off of allowances started in September 2008 and continued in the first months of 2009. ETS companies looking for liquidity realized that allowances,

[8]Carbon leakage occurs when, for reasons of costs related to climate policies, business were to transfer production to other countries with laxer emissions constraints. See EC "carbon leakage" at https://ec.europa.eu/clima/policies/ets/allowances/leakage_en, accessed January 15, 2019.

[9]The EC estimated the surplus at the start of phase 3 to be around 1.5–2 billion allowances (EC 2012; see also World Bank 2013: 42).

allocated for free, were valuable assets that could be sold on the market to raise cheap cash. Financial speculators such as hedge funds were reported as taking part in this sell-off (World Bank 2010). The wide sell-off helped trigger a collapse in carbon prices at the time.

Significantly, low and volatile carbon prices offered poor incentives for investments in zero- or low-carbon technologies and energy efficiency. This result has been officially admitted. According to the International Energy Agency (IEA) (2014: 12), for instance, investments in renewable energy (RES) in the power sector in EU were encouraged by generous support mechanisms and not by the EU carbon market.

4. The Third Trading Period (2013–2016) and Its Results

4.1. Amendments in the EU ETS, compliance results, and carbon prices

The European Commission made an effort to correct several pitfalls of the EU ETS for phase 3 as part of an integrated package of three proposals for implementing measures for the EU's objectives on CC and energy in January 2008. The Commission set a new overall target of reduction in GHG emissions of at least 20 percent from 1990 levels by 2020. At the same time the EU committed to increase the share of RES in overall EU energy consumption to 20 percent by 2020 and the energy efficiency by 20 percent (EC 2009: 63).

The amended directive (Directive 2009/29/EC) sets for the EU ETS an EU-wide target of 21 percent emissions reduction in 2020 compared to 2005. The most important changes in the scheme are the following: (1) the adoption of a single EU-wide emissions cap declining at 1.74 percent per year; (2) the enlargement of scope through the inclusion of new industries (e.g., aluminum and ammonia producers, bulk organic chemicals, carbon capture and storage [CCS])[10] and two further gases (nitrous oxide and perfluorocarbons); (3) the adoption of auctioning as the default principle for allocation, to be mainly applied as rule to the electric utility sector in 2013 and to be gradually introduced for the remaining industrial sectors by 2027 at a rate depending on risks of carbon leakage for each sector; (4) free allocation for industrial sectors based on centrally determined benchmarks and risk-exposure lists of sectors; (5) limitations on offset use, combined nevertheless with enabling provisions for linking the scheme with other GHG cap-and-trade systems, not included in the preceding KP framework; and (6) distribution of revenues from auctioning to member states to be largely based on the allocation of "auction rights," mainly determined by the country's share in the total (2005) verified emissions or the average of the 2005 to 2007 period, whichever is the highest (EC 2009; Vlachou and Pantelias 2017a, 2017b).

The EC estimates that during phase 3 at least 57 percent of allowances will be auctioned. Based on auction revenues, the NER300 funding program for innovative low-carbon energy demonstration projects was established for the third phase.[11] The program is conceived as an important stimulus for the demonstration of CCS and innovative RES technologies on a commercial scale within the EU.

The first results from phase 3 continued to be disturbing. In 2013, there was a surplus amounting to 8.9 percent of total allowances issued (free allowances and auctioned ones), including NER300 auctions. The monthly average spot price of EUA was quite low ranging between €3.44 (May 2013) and €5.21 (January 2013), according to the European Energy Exchange (EEX) (Vlachou and Pantelias 2017a).

[10]The inclusion of aviation emissions starting in 2012 was implemented through a separate directive.

[11]It is so called because it is funded from the sale of 300 million emission allowances from the New Entrants' Reserve (NER).

As a result, and after long prior discussions, in the first quarter of 2014, the EC implemented the *backloading* of auctions in an effort to rebalance supply and demand. This meant postponing the auctioning of 900 million allowances to reduce the surplus in the short run. The volume of allowances to be auctioned was planned to be reduced by 400 million in 2014, 300 million in 2015, and by 200 million in 2016 (EC 2014b).[12]

The European Commission had also taken action to set up a more permanent mechanism to correct market imbalances. It proposed the start of a *market stability reserve* (MSR) at the beginning of the next trading period, in 2021. MSR aims at addressing surpluses by adjusting the supply of allowances to be auctioned. On the basis of certain rules, allowances deducted from the amount to be auctioned are placed in the MSR. Conversely, allowances may be released from the reserve and auctioned. Therefore, the creation of the MSR does not change the number of free allowances. Likewise, it does not affect the total quantity (the cap) of allowances across the EU. A decision was reached by the European Parliament and the Council on October 6, 2015, which stipulates that the MSR will start operating from January 1, 2019, 2 years ahead of the originally proposed schedule (EC 2014a; European Parliament and Council 2015).[13]

To evaluate the environmental performance of the scheme in phase 3, we have calculated the verified emissions and the total allocated allowances (which is the sum of freely allocated allowances and auctioned or sold allowances by governments, including auctions under NER300) of all stationary installations and aviation for each of the EU-28 countries and the three EEA-EFTA countries[14] for the years of 2013 to 2016. To do so, we used official data from the EC on verified emissions and compliance by EU ETS installations for the years 2013 to 2016 (last modified June 15, 2017).

At the aggregate level, verified emissions declined between 2013 and 2016 by 7.7 percent while allocated allowances declined even more (by 26.2 percent). Total verified emissions for 2013 to 2016 amounted to 7501.8 $MtCO_2$. Total allocated allowances amounted to 6882.8 $MtCO_2$, 55 percent of which was freely allocated and 45 percent auctioned. There is an overall shortage of 619 $MtCO_2$, that is, 8.3 percent of verified emissions. In the absence of backloading, an overall surplus would have appeared, amounting to 3.8 percent of verified emissions for 2013 to 2016. Figure 1 presents the freely allocated and auctioned allowances, and verified emissions at the country level for the period 2013 to 2016. Despite the backloading, several countries (including economies-in-transition) still experience a surplus.

The use of KP credits is critical regarding the extent to which ETS compliance is based on domestic emissions reductions. In phase 3, credits cannot be surrendered directly for compliance; they must be first exchanged for EUAs. As a result, data on KP credits used for compliance at the level of installations and countries are not easily detected and neither were they made publicly available by the EC. However, according to the EC, “As of June 2017, the total number of international credits used or exchanged amounts to 1.48 billion, accounting for over 90 percent of the estimate for the allowed maximum” for phases 2 and 3 (2008–2020) (EC 2017b: 21). Participants in the EU ETS used 1.058 billion international credits (in

[12]The auction volume would increase by 300 million in 2019 and by 600 million in 2020. However, it was later decided that the 900 million allowances that were back-loaded in 2014 to 2016 will be transferred to the market stability reserve rather than those auctioned in 2019–2020. See “market stability reserve” at https://ec.europa.eu/clima/policies/ets/reform_en, visited June 10, 2,018.

[13]Moreover, the revised EU ETS directive (Directive [EU] 2018/410) institutes cap reduction of 2.2 percent per year, instead of the current 1.74 percent, from 2021 onwards.

[14]The three EEA-EFTA countries are Iceland, Liechtenstein and Norway.

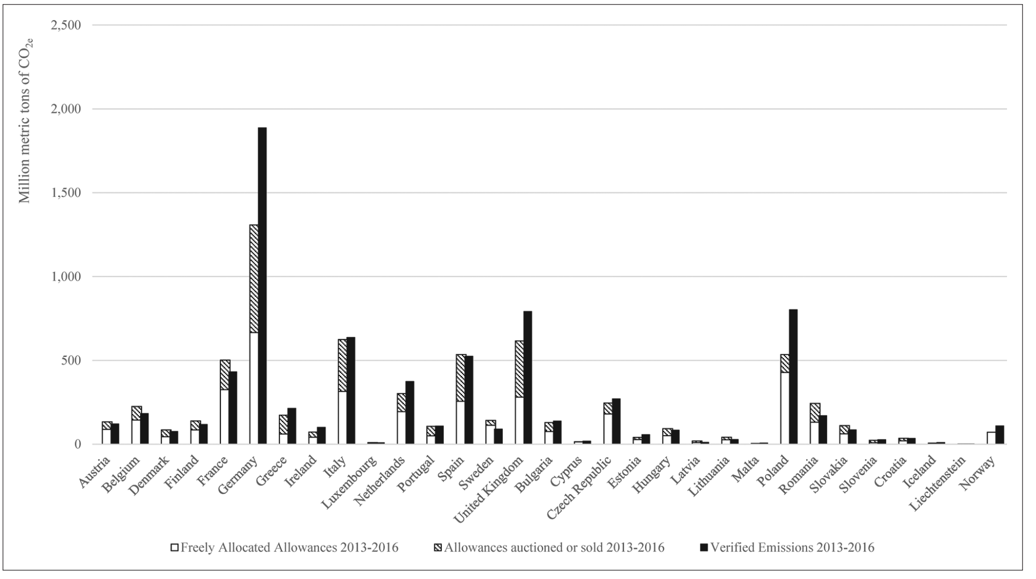

Figure 1. Freely Allocated Allowances, Auctioned or Sold Allowances by Government, and Verified Emissions by Country in the EU ETS for the Years 2013–2016.

Source: European Environment Agency, online data: "EU ETS data from EUTL": ETS_Database_v24.

tons) in phase 2 (2008–2012).[15] This implies that 0.422 billion international credits have been used or exchanged since the initiation of phase 3 up to June 2017;[16] when compared to the overall shortage of 619 $MtCO_2$ in 2013 to 2016, KP credits seem to have played a significant role in containing the EUA shortage that had to be covered by domestic (EU) reduction efforts.

We focus now on the environmental performance of the scheme in Greece. Using data from the EU Transaction Log, total verified emissions for 2013 to 2016 in Greece amounted to 213.7 $MtCO_2$, accounting for 2.9 percent of the overall verified emissions of EU ETS installations in EU-28 and the three EEA-EFTA countries. Combustion of fuels accounted for 74.8 percent of total verified emissions of stationary installations, with the Public Power Corporation (PPC) alone accounting for 68.1 percent of them. Among the remaining non-combustion sectors, the topmost shares were evidenced in cement clinker and oil refining.[17]

Total allocated allowances amounted to 172.6 $MtCO_2$, 35.3 percent of which was freely allocated. The limited share of freely allocated allowances is justified by the significant share of fossil-fueled electricity generation plants in emissions from ETS installations. Comparing verified emissions to the aggregate of freely allocated and auctioned allowances, Greece experienced an overall shortage of 41.2 $MtCO_2$ amounting to 19.3 percent of verified emissions for the period 2013 to 2016.

[15]See also https://ec.europa.eu/clima/policies/ets/credits_en, accessed June 15, 2018.

[16]This is compatible with the evidence provided by EC (2017b) that until June 30, 2017, 423.16 million of credits have been used or exchanged in phase 3. It should be noted that CERs constitute 54.6 percent of the total credits used or exchanged and ERUs the remaining 45.3 percent. A high percentage of CERs (71.1 percent) originated in China, while 76.9 percent of ERUs originated in Ukraine (EC 2017b: 40).

[17]Since inclusion into the ETS in 2012, aviation accounted for almost 1.6 percent of total verified emissions from ETS liable operators in the country.

The protracted economic crisis and austerity programs are implicated for the decline of GHG emissions in Greece. During the period 2013 to 2016, verified emissions from stationary installations were decreasing on a year-by-year basis. From a level of 58.6 $MtCO_2$ in 2013, they dropped to 46.3 $MtCO_2$ in 2016 (a 20.9 percent decline). The decline in fuel combustion activity was considerable (28.9 percent). However, overall verified emissions of combustion installations exceeded the freely allocated allowances by 152 $MtCO_2$, indicating a considerable allowances shortage, especially for the PPC, to be covered by purchases at auctions and secondary markets.[18] With respect to other (non-combustion) industrial sectors, freely allocated allowances were higher than verified emissions in several sectors, giving rise to a surplus of freely allocated allowances as economic activity slowed down with the crisis and austerity programs. Refineries were an exception as they experienced a shortage (4.7 $MtCO_2$) of freely allocated allowances.[19] Overall, stationary installations had to buy compliance allowances (including CERs and ERUs) amounting to 151.6 $MtCO_2$, while the aviation sector had to buy allowances amounting to 1.1 $MtCO_2$.

With respect to CERs and ERUs exchanged for EUAs for 2013 to 2016, we were able to access data only for PPC. However, it should be mentioned that, based on data provided above, PPC accounted for 93.5 percent of the overall shortage of free allowances in Greece, meaning that PPC's purchases of CERs and ERUs are a good approximation of the total international credits used for compliance by Greece. CERs/ERUs bought for compliance by PPC for 2013 to 2016 amounted to 4.43 $MtCO_2$ (3.1 percent of allowances surrendered by PPC) at a total cost of €30 million.

Let us turn now to carbon prices. Surpluses (shortages) in the EU carbon market are reflected in the prices of allowances. We have drawn prices of EUA for 2013 to 2016 from auctions conducted by the common auctions platform (EEX). Figure 2 presents the auction spot prices of auctions of EUAs made for EU countries with EEX as the common platform. According to the EC (2016b: 5), for stationary installations, the average auction clearing price for EUAs was €4.43 in 2013, €5.90 in 2014, €7.62 in 2015, and €5.26 in 2016. Despite backloading, EUA prices are still quite low to act as catalyst for the transition to a low-carbon economy, the professed goal of the scheme. Prices kept rising in 2014 and 2015 but dropped and oscillated a lot in 2016. One has to wait and see whether, and to what extent, the permanent MSR mechanism (starting from January 1, 2019) will be able to correct market imbalances, boosting up carbon prices. In any case, the MSR itself proves that the EU carbon market is not a self-regulating one, questioning its neoliberal underpinnings.

Auction revenues can be used to finance the transition to a low-carbon energy system. In particular, the revised EU ETS directive specifies that member states should use at least 50 percent of auctioning revenues for climate- and energy-related purposes. Since 2014, member states are required to report annually on the amounts and use of these revenues. Over the period 2013 to 2016, nearly €15.8 billion from the auctioning were collected by member states.[20]

[18]With respect to PPC (the major power company), its verified emissions dropped from a level of 41.3 $MtCO_2$ in 2013 to 28.4 $MtCO_2$ in 2016 (a decline of 31.2 percent). This outcome reflects not only the impact of crisis and austerity programs in the form of reduced demand but also the impact of priority dispatching for RES power plants (a support mechanism for RES) (IEA 2017). Given the small amount of free allowances allocated to PPC, the company had to buy allowances for compliance (including CERs and ERUs exchanged for EUAs) amounting to 142.8 $MtCO_2$ for the period 2013 to 2016. Taking into consideration that all Greek installations had to buy EUAs amounting to 152.7 $MtCO_2$ in total, PPC is the major Greek player in the EU carbon market.

[19]A table with the sectoral performance of ETS in Greece for 2013 to 2016 can be provided upon request.

[20]Information is available by EC at https://ec.europa.eu/clima/policies/ets/auctioning_en, accessed May 20, 2018. Analysis of the use of auction revenues by member states for the first years of phase 3 can be found in EC (2017a).

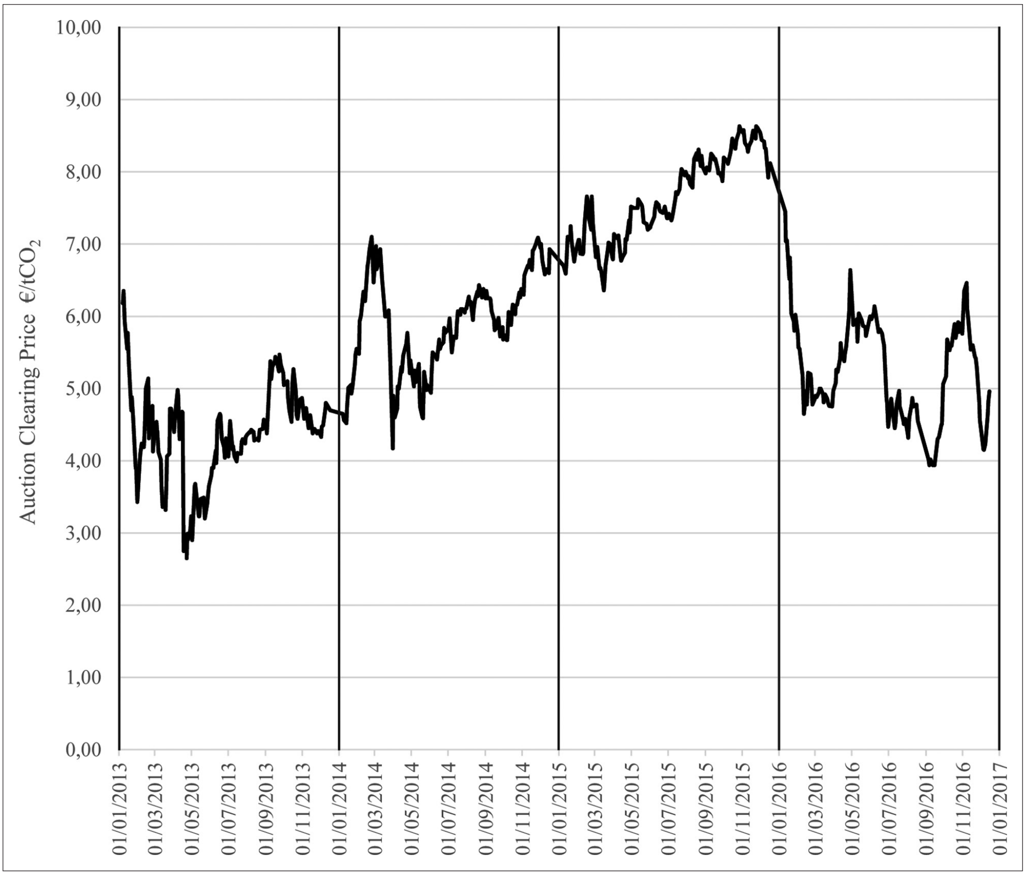

Figure 2. Price of EU Allowances in Spot Primary Market Auctions in the Common Platform, 2013–2016.

Source: European Energy Exchange (EEX), EUA Primary Market Auction Report: Emission Spot Primary Market Auction Report 2013, 2014, 2015, 2016.

4.2. Evaluating the third phase with attention to its distinct outcomes in Greece

Several evaluations of phase 3 are emerging (see, for instance, Ellerman, Marcantonini, and Zaklan 2016; Vlachou and Pantelias 2017a, 2017b). Critical assessments start with the insufficient target. It is argued that a reduction of at least 40 percent in 2020, compared to 1990 levels, was needed; such a target has been set by the EU in "the 2030 energy and climate framework," and it is to be achieved by 2030. Tighter caps, however, are challenged by business on competitiveness grounds as a strong global climate agreement is still wanting. The Paris agreement signed in 2015 is a weak agreement: on the one hand, it lacks legally binding reduction targets (see, for instance, Harvey 2015), and, on the other hand, it has had to confront the withdrawal of the United States since US President Donald Trump announced on June 1, 2017, that the United States would cease all participation in it. On the front of environmental effectiveness, surpluses experienced in the phase 2 continue to haunt phase 3 of the ETS, albeit they are reduced, kept in check through decreasing caps and backloading.

Resulting low and volatile carbon prices continue to provide little incentive for investments in emissions reduction projects. The EU has not really considered introducing a price floor as means to stabilize carbon prices. Nevertheless, individual countries such as the Netherlands have announced their intention to introduce a carbon price floor for ETS electricity plants (World Bank 2018: 48).

Auctioning removes windfall profits (rents). It, nevertheless, increases the cost for ETS installations and, consequently, the prices of their product; as a result, firms resist it and lobby for free allocation, especially if they compete in international markets with rivals that do not face carbon restrictions. Moreover, as a default allocation, auctioning increases the price of electricity and leads to subsequent broad distributional and competitive impacts on buyers. On the other hand, the use of revenues from auctioning for climate and energy-related purposes tends to become an issue of conflict over various competing undertakings, with class and social implications, as shown below in the case of Greece.

EU ETS had several different effects on Greece in 2013 to 2016, when the country was in deep recession.[21] These effects substantiate the class biases of the scheme. In phase 3, there have been significant cost implications for the electricity sector, compared to limited ones in phase 2. Electricity prices in Greece are regulated to integrate climate and energy policies, most set at the EU level. Since the free allocation of EUAs to power production is eliminated (with a few exceptions) in phase 3, the Greek government, in collaboration with the Regulatory Energy Agency (RAE), decided to incorporate the cost of EU ETS in the price offers made by production units in the day-ahead wholesale electricity market for real-time dispatching; via this pass-through, the ETS cost would be part of the variable cost of electricity (which is conceptually the base of these price offers). Full implementation was to start from January 1, 2013, and became critical for electricity prices, as auctioning became the default allocation (Greek Government Gazette 2011).

Based on the data kindly provided by PPC upon request, we find that the PPC bought 143 million of allowances (including exchanged CERs and ERUs for EUAs) for compliance at a total cost of €896.7 million for the period 2013 to 2016. Based on the same data, we

TABLE 1. The Cost of Emissions Trading System Compliance for PPC, 2013–2016.

	2013	2014	2015	2016
1. Allowances/credits bought (in million tons of CO_2e)	41.29	39.01	34.21	28.34
2. Average cost of allowances/credits weighted by volume (euro/tn of CO_2e)	6.03	5.61	7.37	6.23
3. Total cost of compliance (million euro)	248.80	219.00	252.23	176.67
4. The cost of compliance per MWh of thermal power production (euro/MWh)	8.02	7.03	8.88	7.05
5. Average system marginal price (SMP) (euro/MWh)	41.47	57.56	51.93	42.85
6. Cost of compliance as a share of SMP (%)	19.4	12.2	17.1	16.5

Sources: 1. Calculations for 1–4 were based on data kindly provided by Public Power Corporation (PPC) S.A. upon request.
2. Data on SMP: Regulatory Authority for Energy (RAE)-National Report for the European Commission 2016; National Report 2017.

[21] According to Eurostat, GDP per capita (at current prices) in Greece dropped from €21,800 in 2008 to €16,400 in 2016; its relative amount compared to the average per capita of the Euro Area (EA-19) dropped from 75.4 percent in 2008 to 51.6 percent in 2016. See Eurostat online database, "Main GDP aggregates per capita [nama_10_pc]"—Last update: January 17, 2019 (extracted on January 19, 2019).

calculated the average cost of compliance to ETS for PPC per MWh produced by thermal power plants for the years 2013 to 2016, which is presented in table 1. We compare it to the average system marginal price (SMP) of the wholesale power market, which was drawn from reports published by RAE (2016, 2017). SMP corresponds conceptually to the short-run marginal cost (i.e., the marginal operating cost); in practice, it is the bid of the costliest plant needed to be put in operation to meet demand (RAE 2017: 44). The average cost of compliance to ETS for PPC per MWh produced by thermal power plants for the years 2013 to 2016 ranges from 12.2 percent to 19.4 percent of the SMP in the wholesale electricity market. As the ETS compliance cost is being passed on to electricity buyers, negative implications for the competitiveness of Greek firms and for the real income of Greek households follow.

This cost transfer raised resistance from Greek businesses as it tended to exacerbate long-standing differences in competitiveness between Greek firms and their counterparts in more advanced EU countries, deepening the uneven capitalist development of Greece within the EU (Vlachou 2012). Not surprisingly, however, pressures from business over competitiveness issues were also exerted in other EU countries, including highly competitive ones, in view of carbon leakage. As a result, such fears were partially eased by using a provision in the revised EU ETS Directive (2009/29/EC, Article 10a). To a considerable extent,[22] power price increases due to indirect EU ETS costs are being reimbursed to industrial firms vulnerable to carbon leakage risks, using national financial resources, after EC approval. In 2017, this practice was in place in 10 EU countries, including the United Kingdom, Germany, Spain, Netherlands, and the region of Flanders (EC 2017b).[23] In short, competitiveness concerns gave rise to a compensation mechanism for electricity-intensive ETS firms, financed by national resources.

In 2014, the government of Greece also established a state-aid scheme for the 2013 to 2020 period to compensate—following EC approval—electricity-intensive firms mainly operating in the production or the processing of ferrous and non-ferrous metals, production of secondary aluminum, and production of bulk chemicals (EC 2014c). The necessary funds for this aid come from Greece's revenues from the auctions of allowances, and are managed by LAGHE (Operator of the Electricity Market in Greece).[24]

According to the EC (EC 2017b: 16), the approved ceiling of the indirect carbon cost compensation for Greece was €160 million for the years 2015 to 2018, that is, an annual average of €40 million. Greece's auction revenues (excluding aviation allowances) for 2016 were €147 million. This means that approximately 27 percent of Greece's auction revenues (excluding aviation allowances) were returned in 2016 to industrial firms vulnerable to carbon leakage as compensation for indirect EU ETS costs. This support extends *beyond* the free allocated allowances to them for the same reason, although the latter were not fully used for compliance as the allowances surplus indicates. It should be remembered that auction revenues were earmarked, albeit on a voluntary base, for funding climate and energy initiatives aiming at reducing GHG emissions domestically (EC 2017b). Now they are in part granted as additional support to industrial ETS installations to protect their international competitiveness. We should not, however, miss the uneven development aspect of this

[22]The maximum aid intensity, defined as the percentage of eligible costs according to which the maximum amount of state-aid is computed, was set at 85 percent of the eligible costs incurred in 2013, 2014, and 2015, 80 percent of the eligible costs incurred in 2016, 2017, and 2018 and 75 percent of the eligible costs incurred in 2019 and 2020 (Source: EC 2014c: 4; Greek Government Gazette 2014: 38376).

[23]For a critique from a Green MEP, who largely is in favor of EU ETS, see Eriksson (2016).

[24]The annual budget for aid will fluctuate with CO_2 price and was estimated to be between €14 million with a CO_2 price of €5/ton to €20 million with a CO_2 price of €7.5/ton (EC 2014c: 2).

state-aid scheme. Hard-hit by the crisis and in need of liquidity, Greek industrial firms fiercely resisted any cost increases in order to survive international competition. To their detriment, carbon cost compensation was demanded by and granted to their counterparts in Germany ("the locomotive of EU") and in other EU countries so that Greek firms are expected to further slide down the ladder of uneven development.

On the other hand, households were afflicted by energy poverty due to increased electricity prices, in part caused by EU ETS compliance costs, in the midst of crisis and harsh austerity programs. Besides the ETS cost, households disproportionally shoulder the cost of the hasty and ill-designed RES advance into electricity generation. Strikingly, official evaluations admit that the penetration of RES into power generation was not really stimulated by carbon prices, as was initially promulgated by the designers of the EU ETS, but was the result of considerable support measures for RES such as generous feed-in-tariff (FiT), priority dispatching, and long-term contracts for power purchase, both at the level of EU and in Greece (IEA 2014, 2017; RAE 2016; WWF-Greece 2013).[25] These support measures, combined with reductions in the investment cost of RES, made the entry of private investors into RES quite profitable.[26] Based on the data provided by the European Commission, the share of RES in electricity generation in Greece increased from 11.7 percent in 2005 to 29 percent in 2016, while the share of solid fuels (lignite) decreased from 59.2 percent in 2005 to 33.2 percent in 2016 (EC 2018). At the same time, there was an overshooting in photovoltaic generation capacity: the target of 2,200 MW of cumulative photovoltaic generation capacity for 2020 was achieved as early as 2013. Since such overshooting was not unique to Greece as other EU countries reached the 2020 target quite early (IEA 2014), it indicates a poor design of EU-wide PV/RES policy.

The generous RES support system in Greece, administered through a special account,[27] was poorly financed at first by an RES tax. Later on, it inescapably encountered further financial problems as a result of inadequate power sales revenues due to reduced demand and accumulated unpaid electricity bills.[28] The Greek government initiated several measures to balance out the RES deficit by the end of 2017, including increases in the RES duty (established now as a special levy on air pollutant emissions with the acronym ETMEAR) on final consumers and channeling part of the revenues from auctions of EUA to the RES account (IEA 2014, 2017; RAE 2016; Vlachou 2017). ETMEAR is unfairly shouldered by households. According to RAE, the charge for households was set at €20.8/MWh in 2013, 26.30 in 2014 to 2015, and 24.87 in 2016; by comparison, the charge for large electricity-intensive industrial firms (high-voltage customers) was set at €1.79/MWh in 2013, 2.23 in 2014 to 2015, and 2.41 in 2016.[29]

[25] An FiT is an energy supply policy focused on supporting the development of RES projects by offering long-term purchase agreements (typically, 15–20 years) for the sale of RES electricity at guaranteed prices (usually differentiated by technology type, installation size, and project location in order to better reflect actual project costs).

[26] According to IEA (2017: 108) on Greece: "The PV sector has attracted high interest from investors due to the favorable FiT programme, reduction of PV capital expenditure, and adoption of different policy measures for streamlining of the licensing procedure (exemptions for the obligation of obtaining certain licenses for smaller installations)."

[27] Its cost peaked at €2 billion in 2013 and was reduced to around €1.7 billion per year in 2014 and 2015 (IEA 2017: 105).

[28] For PPC, provisions for bad debt amounted to €950.4 million in 2015, representing 16.6 percent of its total revenues in 2015 (PPC S.A.—Hellas 2016: 36–37). Being a state-regulated firm, PPC initiated adaptable debt settlements of accumulated electricity debt with its customers, instead of disconnecting service.

[29] See RAE's Press Releases of 19.07.2013 and 07.12.2015 on ETMEAR, available at http://www.rae.gr/site/categories_new/about_rae/factsheets/2013/major/19072013.csp; http://www.rae.gr/site/categories_new/about_rae/factsheets/2015/major/0712_2.csp, accessed December 28, 2018.

The ill-designed RES policy and the ETS compliance cost thus resulted in increased levies and charges on electricity consumed by working people who have already faced harsh wage cuts or, even worse, have lost their jobs, as substantiated by the high unemployment rate in the country (Konstantinidis and Vlachou 2017, Konstantinidis and Vlachou 2018; Vlachou 2012). In addition, the costs of energy-poverty relieving measures initiated by the government were passed through to final consumers via electricity bills. For instance, a social residential tariff was initiated by the government since the beginning of 2011 for vulnerable customers to combat energy poverty. In 2015, 608,714 residential customers with a total consumption of 2.2 million MWh joined this program (RAE 2016: 71). The cost of this program is not assumed by the state budget but, instead, is being passed through the electricity bills to the final customers (as a cross subsidy between consumers). Social discontent over electricity bills has been mounting with increasing intensity as economic depression escalates, as evidenced in consumer complaints to the RAE.[30]

Moreover, due to decreases in electricity demand, RES enhancement, as well as the EU ETS cost, low-cost lignite generation capacity became increasingly underutilized, with a negative impact on PPC's revenues, its profitability, and its ability to service its debt payments, while in the process of being privatized, set as an austerity program requirement (IEA 2017: 65; Konstantinidis and Vlachou 2018; PPC S.A.—Hellas 2016). Since lignite generation was of low-cost (including ETS cost), its reduced employment resulted in increased electricity prices.

All the above indicate that the burden of ETS cost (and RES enhancement) is largely shouldered by the working people in Greece, who are also being harshly pauperized by the severe austerity programs. This is clearly a class-biased and unfair design and product of climate and energy policy. At the same time, this policy tends to discredit the use of ETS and RES in the eyes of many in Greece.[31] It definitely creates social grievances against such deep-rooted anti-labor class transitions to a low-carbon economy. The narrative of green growth as a way of exiting the crisis and of paving the path to future ecologically sustainable prosperity sounds like a fairy tale to working people in today's crisis-ridden Greece who also witness the ongoing appropriation of nature in Greece as part of the repressive neoliberal restructuring of the Greek capitalist economy (see also Konstantinidis and Vlachou 2017, 2018).

In reacting to this harsh restructuring, part of the working people, feeling tired and exhausted, withdrew from the public sphere into despondency; others, full of anger, moved to the far-right of the political spectrum, questioning the workings of the Greek political system and the domineering EU institutions. However, a considerable part of the working people was engaged in struggles against electricity supply disconnections,[32] evictions, and

[30]It is reported that "the continuous economic crisis makes consumers more concerned on increasing bill expenses. In addition a standard energy bill especially the electricity bill contains many different charges and levies…" (RAE 2016).

[31]WWF-Greece (2013) talks of a wide social devaluation of RES projects, especially at the local community level on Greek islands, even before Greece's delving into deep crisis. This was due to problems and conflicts related to their siting, which was perceived as threatening community's pluriactivity, wildlife, and protected areas. A large number of appeals were submitted by activists to the Council of State on these grounds.

[32]Electricity supply disconnections were due to unpaid power bills or emergency property taxes—when the latter were introduced, they were initially collected via electricity bills. On November 20, 2011, a large mobilization took place with the lead of PPC's trade union, GENOP-DEH, which occupied the building sheltering the PPC's bureau responsible for issuing electricity bills and disconnection orders (in coordination with labor centers, unions, local municipalities, social organizations, citizen unions in 10 cities) in order to block the posting of disconnection orders to households all over Greece due to unpaid power bills (which included emergency property taxes). Among the supporters of this activism was the president of SYRIZA, Alexis Tsipras, arguing for the abolition of the emergency property tax. A property tax

foreclosures, environmentally unfriendly industrial wind parks, further privatization of electricity, and other neoliberal lines of attack. They also developed new forms of solidarity such as networks for the provision of food, energy, clothing, healthcare, as well as legal advice against electricity disconnections, evictions, and foreclosures (Hadjimichalis 2013, 2014a; Kousis, 2014). Both opposite tendencies (withdrawal from the public sphere and fervent social mobilization) coexist; as their intensity varies over time, responses inspired by an eco-socialist vision are hoped and need to be encouraged.

5. Concluding Remarks

Despite adjustments and changes, the EU ETS has been characterized by limited environmental effectiveness and unjust distributional effects. Allowance surpluses led to low and volatile carbon prices, which do not provide incentives for investments needed by private investors for a transition to a low-carbon economy. Deeply grounded in neoliberal capitalism, the EU ETS was further challenged by the economic crisis through increased allowance surpluses, price volatility, and financial risks (see also Lohmann 2009a, 2009b, 2015; Berta, Gautherat, and Gun 2017; Vlachou and Pantelias 2017a, 2017b).

Moreover, the application of EU ETS in Greece in times of crisis revealed the inflexibility of the ETS architecture (and EU climate policy, for that matter) to economic shocks in cases of structural asymmetries in the energy and economic systems of member states. Significantly, it also revealed the structural inability of Greece, as an EU member, to build its own path toward a low-carbon economy, taking into account its serious limitations at the time. When hit by a severe crisis, Greece could not react to the asymmetrical circumstances it faced by following a unilateral path to exit the crisis (Vlachou, Theocarakis, and Milonakis 2011). The EU neoliberal architecture at all levels, including climate and energy, leaves unevenly developed countries like Greece without real choice in tailoring climate policies such as the ETS (or energy policy such RES enhancement) to its own needs, priorities, and timetables. This major implication of our critical investigation is also reached in a mainstream study by the IEA (2017: 94):

> All climate and energy policies originate from EU initiatives or obligations. This results in two main risks, which could lead to additional challenges for the Greek energy system and its economy as a whole. First, without a long-term national climate policy strategy, it is difficult to balance and optimize different options to reduce GHG emissions and to specify instruments according to the long-term potential and needs of Greece. Second, Greece should be better prepared to cope with potential future technical, social, or economic developments, as well as any possible future obligations that may arise from EU or other international commitments.

In other terms, locked in the unequal capitalist development within the EU, Greece has to follow EU-wide neoliberal climate and energy policies designed under the influence of the dominant class interests in the EU, no matter their troubling impacts (see also Vlachou 2012; Konstantinidis and Vlachou 2017, 2018).

These remarks have been substantiated by looking into the application of EU ETS in Greece during the period 2013 to 2016. In the midst of deep recession, Greece desperately needed some choice over its transition path to a low-carbon economy. One would expect that

is still in effect but not collected via the power bills any more. See http://www.genop.gr/20/11/2011, and https://www.naftemporiki.gr/story/313668/ypeka-as-stamatisoun-na-paristanoun-ton-rompen-ton-dason.

Greece should be able to make, for instance, a greater use of its installed low-cost lignite generation capacity in the short- and medium run, and comply with GHGs' reduction obligations over a longer time period. By gradually phasing-out lignite generation and introducing RES generation, Greece would have followed a cost-effective way to meet its emissions reduction target, taking into account its own limitations and prospects in a time of crisis. In the case that the country could reduce GHG emissions according to its own priorities, it could save scare financial resources, especially in the power sector, for stimulating economic growth and relieving energy poverty; avoid the deterioration of economic position of the indebted PPC and the hasty devaluation of its (indigenous) lignite-fired power capacity; and gain the time needed to build its own, socially constructed (hopefully socialist) path to economic recovery toward a low-carbon economy. However, the EU architecture at all levels shaped by the dominant capitalist interests in EU proves to leave unevenly developed countries like Greece without real choice for its own road to sustainable development. EU ETS, in particular, in its current form, is forcing a rapid and costly decarbonization upon the Greek people hard hit by crisis and adjustment programs.

An extensive restructuring of the existing energy system, production, transport, and other social systems is indeed needed for climate sustainability in Greece. This restructuring, however, should take into account Greece's intense need to exit the severe crisis and also its limited means, along with workable timetables. The restructuring would not be a class-neutral process. From the standpoint of working people and the unprivileged in Greece, ecological/climate sustainability needs to be combined with a socialist transformation of Greek society in which a collective and non-exploitative organization of production would prevail. Disappointment and disenchantment seem, however, to prevail among working people, as a consequence of the recent failed struggles of the Greek people opposing austerity programs against dominant national and EU business interests and also as part of the giving up of the socialist vision by the 2015 to 2019 left-wing (by origination but not by doing) administration. A strong radical collective subjectivity—hopefully close to a new eco-socialist vision—could emerge as people draw their own conclusions from the lessons learnt, including those from the neoliberal climate policies originated by the EU.

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