

Climate change, carbon trading and societal self-defence¹

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Abstract

Markets, especially those for 'fictitious' commodities, are not the simple result of the gradual extension of exchange relations but social and political constructs. This paper discusses the socio-historical development of carbon markets and their application in the EU against the background of a Polanyian 'double movement': the reembedding of labour, money and land into social ties in the post-war decades was followed by a 'counter-counter movement' in the form of transnationalisation processes in production and investment, and, particularly, the liberalisation of financial markets. The paper analyses history and procedures of the EU Emissions Trading System (EU ETS) as a climate change (CC) mitigation means and in analogy to financialisation processes. First, it outlines three methods in environmental regulation of capitalist markets: direct regulation, Pigouvian taxation and commodification or emissions trading, and then it empirically assesses the EU ETS highlighting inherent flaws such as over-allocation of certificates, carbon-price volatility and the significant bureaucracy and costs. The paper demonstrates that actual carbon markets have as yet opened up new investment opportunities particularly for finance capital and a range of new career paths but contributed next to nothing to CC mitigation. To avoid dangerous CC other policy means would need to be applied as soon as possible.

Introduction

Karl Polanyi (1944) interpreted capitalist development as the outcome of a 'double movement'. The first part of this movement involved the imposition of 'free markets' in the nineteenth century.² The damaging social effects of this process, in particular those transforming labour, money and land into 'fictitious commodities', provoked a 'counter-movement' in the 20th century struggles for social and economic democracy and citizenship rights. Countervailing the disruptive social consequences of market liberalism, markets became embedded in a regulatory web that, in the post-war circumstances, was built around an accommodation or a 'class compromise' between national labour movements and employers, who were likewise primarily national in terms of corporate ownership and investment strategies, and governments, which were to a large degree autonomous in social and economic policy. Yet, as Richard Hyman (2013: xiv) observes, these preconditions 'no longer apply'. Transnationalisation and globalisation processes have removed the dominant capitalist agglomerations from national control, and the liberalisation of financial markets has 'spawned and array of exotic commodities which Polanyi could never have imagined: derivatives, secondary markets, hedge funds, private equity, leveraged buy-outs ...' so that national economies are becoming increasingly disembedded from effective social regulations. Not least because the beneficiaries of the new finance-driven accumulation regime have 'little interest in maintaining historic compromises', Hyman (2013: xiv) interprets these recent

¹ An earlier draft of this article was presented at the inaugural workshop of the *Öresund International Political Economy* network in Malmö in November 2013.

² It has often been argued, most recently by Hyman (2013: xiii), that the 'whole idea of free markets is an oxymoron, since all markets are social and political constructs.'

trends in terms of a Polanyian 'counter-counter-movement' involving the 'deliberate unravelling of the regulatory web constructed in previous decades'.³ This paper's point of departure is the hypothesis that a largely disembedded and finance-driven capitalism⁴ features disruptive social and ecological consequences and that policy responses to major ecological issues such as climate change (CC) reflect the lines of policy making that resulted in largely deregulated financial markets, if they are not matched by a popular and academic 'counter-counter-counter-movement' capable to push through the respect of ecological limits within which capitalist development may proceed and corresponding regulation. More particularly, it outlines emergence and functioning of carbon markets as emissions trading schemes, focuses on the parallels to the expansion and procedures of financial markets, and assesses the efficiency of such 'market solutions' as a policy means in CC mitigation.

Any such assessment has to consider the extremely short time frames within which CC mitigation would need to become effective. In its recent Fifth Assessment Report on the Physical Science Basis for Climate Change, the Intergovernmental Panel on Climate Change (IPCC 2013) highlights that concentrations of CO₂ and other greenhouse gases (GHGs) in the atmosphere have increased to levels that are unprecedented in at least 800,000 years with the burning of fossil fuels being the main reason behind a 40% increase in CO₂ concentrations since the industrial revolution. The global surface temperature increase for the end of the 21st century is projected to exceed 1.5°C relative to the period 1850-1900 in all but the lowest scenario considered; other scenarios predict global temperatures to rise as much as by 4.8°C, exceeding the 2°C, beyond which uncontrollable CC with frequent droughts, floods and storms plus largely unpredictable climate feedback effects are expected, by far. The IPCC expects global mean sea levels to continue to rise during the 21st century, by a further 26-82cm. Beyond 2100, it predicts warming to continue, the Arctic sea ice cover to shrink and thin and the Northern Hemisphere spring snow cover as well as the global glacier volume to decrease further. In addition, the UK Tyndall Centre (Anderson 2012: 22) informs that even during the 2009-10 global economic recession CO₂ emissions rose by 5.9% and during 2010-11 by 3.2%. It expects global emission increases of 3-5% per year from 2012.⁵ The prospects for remaining within the 2°C limit are less likely with every year without mitigation. Anderson discusses various scenarios the bottom line of which is that from 2020 carbon emissions need to decrease between 10 and 20% every year in order to hit zero between 2035 and 2045. He concludes that if the 'necessary changes in behavioural and consumption patterns, coupled with the technical adjustments we can make now and the implementation of new technologies', are made, 'there is still an outside possibility of keeping to 2 degrees.' (Anderson 2012: 38) While this is, in principle, good news, it should go without saying that current emissions projections have repercussions for the applicability of carbon markets as the predominant CC mitigation means: the academic problem of whether emissions trading schemes may become efficient in some distant future period is secondary to the issue of whether they are a functioning policy means now and in the immediate future.

³ Polanyi's dialectical framework is complementary, even if not identical, to the regulation theoretical approach that explains the disembedding of the fictitious commodity, labour power, from its web of regulation by taking the erosion of the 'Fordist class compromise' as departure point (see, for example, Boyer and Saillard 2002; Koch 2005 and 2012).

⁴ On the characteristics of a finance-driven accumulation regime, see Stockhammer (2008) and Koch (2012 and 2013a).

⁵ Despite the long-term trend of rising global carbon emissions, virtually all mainstream-analyses assume global emissions to peak within the period 2010-2016 implying that emissions from China and India would peak by 2017/2018; in other words, 'almost all orthodox, low-carbon emission scenarios are premised on implicit assumptions about emissions for non-Annex 1 nations that few, if any, analysts consider appropriate.' (Anderson 2012: 26)

Three methods of environmental regulation and the particularities of carbon markets

It is far from obvious that environmental regulation should proceed through commodification and the creation of markets. Indeed, the commodification of something that is not scarce, such as air, or that has no use value, such as CO₂ – a ‘non-value’ that people normally try to get rid of (Altvater and Brunnengräber 2008: 10) – is difficult and requires the helping hand of an active state. To theorise these difficulties in commodification Böhm *et al.* (2012) suggest distinguishing between ‘real environmental commodification’ in situations where ‘non-human nature is treated as if it was a “true” commodity, such as in the case of mining’, and ‘proxy commodification’, which involves ‘artificially’ commodifying a ‘currently non-commodified entity’; in an attempt at compensating for missing markets and expanding accumulation frontiers, carbon markets can indeed be seen as an ‘example of proxy commodification, providing new opportunities for allegedly “green” accumulation.’ (Böhm *et al.* 2012)

Yet, in principle, there are three methods of environmental regulation within capitalist development that can be combined in single empirical cases. The first method concerns directly regulative measures where the government establishes restrictions on how much pollution a company can emit. Exceeding the allowed values of a particular kind of pollution identified by government authorities leads to penalties ranging from fees to the closure of the emitting industrial unit, and so companies have an incentive to review their production methods. The second method is the imposition of Pigouvian taxes on the producers of negative external effects. Since negative externalities arising from certain economic activities lead to damages for third parties and to costs for the general public that are not already covered by the private costs of the company, this activity is taxed in order to ‘correct’ the market outcome so that efficiency is achieved. Following Arthur C. Pigou (1932), governments should use the tax income raised for compensating for damages caused and for financing of measures against causes of the damage.⁶

Neoclassical environmental economists criticise Pigouvian taxation and direct regulative measures on the ground that the government is in control of both procedures and outcomes and not the market. This is seen as restricting innovation as well as being inefficient. The third method of ‘internalising’ external effects therefore gives priority to the market by creating tradable rights or pollution allowances. Pollution- or emission-trading schemes are essentially an application of the ideas of Ronald Coase (1960: 15), who suggested the construction of specific property rights in order to identify and separate the affecting and affected parties in relation to ecological damages and to calculate these economic costs. The introduction of private trading of allowances would enable affected parties to decide for themselves, if, how and to what extent they should restrict environmentally harmful activities. Instead of a costly and cumbersome bureaucracy, as in Pigou’s tax regime, perpetrators of environmentally harmful actions would be disciplined but, according to Coase and his followers, in much cheaper and more effective ways. External costs that were previously met by the public would be internalised, and so companies would be confronted with the real costs of their actions and change their production methods accordingly. Hence, those companies that could not easily function without creating pollution would acquire the right to do so from others for whom emissions reduction was easier to achieve. For Coase, another advantage of the market over

⁶ There are also positive external effects where the public benefits from an activity that the market undersupplies. Pigou (1932) suggested subsidising such positive externalities – education, for example – by the state.

tax solutions was that policymakers no longer needed to decide which economic activities were to be taxed and under what conditions. The market would take care of this through the demand and supply of emissions certificates. Finally, Coase was optimistic about the link between pollution, business costs and innovation and technological progress. Rising costs caused by the increasing scarcity of production factors that were previously free would lead to adjustments in the technological and energy basis of the work process, thereby producing optimal ecological results. Dales (1969) deviated from Coase by not leaving the definition of the best overall level of pollution to an imaginary 'perfect market'. Instead he gave this task to the government. Once the state had defined the total level of emissions for a sector of the economy and a specified time period and then issued proportionate emissions allowances, these could be traded freely between economic actors. Those who faced the highest cost of emissions reduction would be prepared to pay the most for the allowances. Those who had comparatively cheap opportunities for emissions reduction would opt for taking advantage of these rather than purchasing permits. With regard to the ecological effects of the mechanism, it is crucial for government authorities to ensure that allowances are issued in such a way that their number is reduced over time so that the price for each emission unit rises sufficiently to create an economic incentive to implement ecologically desirable innovation in the work process (Ptak 2008: 39). In order to keep allowances scarce, Dales suggested auctioning them to companies.

Supporters of market solutions in environmental regulation admit that the establishment of carbon markets is not cheap in the beginning, since governments have to spend money for the definition and enforcement of progressively stricter overall sectoral or societal caps on emissions. They also have to divide emission quotas among the industries under their jurisdiction and set up the legal and measurement machinery for making them tradable (Lohmann 2011: 95). It is only when private property rights to contaminate the atmosphere exist that specialised platforms for emissions trading can emerge and become accessible to holders of emissions certificates worldwide (Tietenberg 2003). Through the implementation of carbon trading schemes, new business and investment opportunities arise for CO₂ brokers, tradesmen and bankers including those representing major finance companies and hedge funds. New actors who are becoming involved in the implementation and operation of carbon trading schemes include market intermediaries, auditing companies, consultants, lawyers and various kinds of researchers. Neoclassical environmental economists and CC governance theorists do not find it problematic that investors are not primarily interested in reducing atmospheric CO₂ concentrations but rather in the financial returns arising from the trading of and speculation with certificates. On the contrary, since the reduction of CO₂ emissions is expected to be a side-product of merely furthering individual profit interests, emissions trading schemes are regarded as a welcome new investment opportunity, especially for financial capital.

Historical development of the EU Emissions Trading Scheme (EU ETS)

According to Paterson (2011: 83), the popularity of carbon markets is thanks to the fact that these have enabled the 'formation of a "winning" political coalition favouring GHG emissions reductions' and businesses to 'imagine a cycle of investments, profits and growth centred on these markets that may help processes of decarbonization'. He distinguishes three historical phases of regime building (Paterson 2011: 83-5). In a first phase, policy networks promoting emissions trading emerged from the early 1990s onwards, when UK and US economists started writing about emissions trading regarding CC and became linked to UNCTAD. In a

second phase, the British faction of the network was organised through a number of informal contacts under the auspices of the Advisory Council on Business and the Environment and the Confederation of British Industry (CBI), eventually becoming the 'Emissions Trading Group'. As an increasing number of actors including the UK government was drawn into the network, this was the period when companies that would be regulated under any measures to address CC – carbon tax or, worse, 'command and control' regulations – 'switched strategies from either active resistance of keeping their hands in the sand towards active engagement to produce policies that least threatened their interests.' (Paterson 2011: 83-4) On the part of the UK government, an important motivation to pursue carbon trading from 1997 onwards was to provide the City of London with early-mover advantages in the emerging carbon markets.⁷ Meanwhile, in the US, the network was more informal, but nevertheless 'highly influential in creating the knowledge base' (Paterson 2011: 85) with which the US could argue forcefully in the UN Framework Convention of CC process for emissions trading. In fact, the idea of emissions trading mechanisms was introduced into the Kyoto process by the US delegation, arguing that only market mechanisms could achieve emissions reductions in an efficient and cost-effective way. Subsequently, in an attempt to bring the US on board, key-negotiating countries reluctantly signed up to the introduction of carbon trading and carbon offsetting. Hence, in a third phase (1997–2003), many actors shifted considerably from skepticism or hostility towards carbon markets to positions of cautious acceptance and increasing enthusiasm.

When the Bush administration withdrew the US support for the Kyoto Protocol in 2001 the EU took over the lead in the formation process of carbon markets. This was facilitated by a change of personnel in the European Commission. Officials who had been skeptical about emission trading during the Kyoto negotiating process left and were replaced by a small group of economists who were much more in favour⁸ and capable of developing and finalising the EU ETS system by 2003. Another crucial factor for this shift was the fact that an European energy tax would have required a unanimity vote of the Council, which the Commission had proved unable to achieve for years, while emissions trading as a non-fiscal measure was allowed to move ahead on the basis of a mere majority vote (Voß 2007a: 339). When it became clear, in 2004, that the EU linking directive of the EU ETS to the Clean Development Mechanism (CDM) and joint implementations (JI) provisions in the Kyoto Protocol would create demand for Certified Emissions Reductions (CERs), more actors became involved. Carbon trading companies such as Ecorescurities, Climate Care, FutureForests (now the Carbon Neutral Company) were founded and a number of major financial players including Barclays, Cantor Fitzgerald, Dresdner Bank and JP Morgan, which bought up Climate Care in 2008 and Ecorescurities in 2009, established carbon-trading offices. What came to be known as the 'carbon industry' is an increasingly organised business sector that provides service for the development and maintenance of emissions markets and involves 'specialised consultancies, banks, brokers, exchanges, risk managers, project developers, journals, conference organisers, news services and so on.' (Voß 2007a: 338) Attached to the new policy paradigm and the new service business is a 'social infrastructure' of specialised skills and professional careers that has led Voß (2007a: 339) to speak of a 'new technology of governance' the main pillars and actors of which – public agencies, trading departments in companies, auditors for emissions, newly created departments in public administration, think tanks, consultancy and law firms, project developers, traders, banks, exchanges, lobby

⁷ And, indeed, Paterson (2011: 90) observes that '59% of all trades in the global carbon markets are organized through London ...'.

⁸ Skjærseth and Wettestad (2008: 75) call this group the 'Bureaucrats for Emissions Trading' group (BEST) including Jos Delbeke, Peter Vis and Peter Zapfel.

groups and information providers – ‘rely on and mutually reinforce, each other.’ The Chicago Climate Exchange (CCX), founded in 2001, was the first system for the registration, reduction and trade of GHG emissions. This was followed by European stock exchanges for emission allowances, for example in Leipzig.

The fact that more and more financial actors moved into the carbon business and/or developed carbon market arms was crucial for the establishment of the EU ETS. Paterson (2011: 90) identifies two ways of profitability in the new market: first, on fully commodified markets such as the European Climate Exchange, where prices can be easily compared and different products can be rendered fungible, financiers ‘make money either through commission on the purchase and sale of permits or credits, through arbitrage practices between the prices of different commodities in the market, or through the creation of a range of derivative products that enable other firms to hedge against price volatility’. The new commodities in these markets are the EU Allowance (EUA) and CER, which are at the same time the units of account for the EU ETS and the CDM, respectively. There are also future and options markets in each so that it is possible to trade allowances ‘before they formally exist, to hedge against both the price volatility inherent in financial and commodity markets ... and the added regulatory risks specific to carbon markets (produced by uncertainties about allocation regimes, measurement questions and policy direction).’ (Paterson 2011: 91) Second, there are markets that are oriented at the transnationalisation of investment, especially through the CDM that is designed to generate investment in carbon abatement projects in developing countries. The exchange of CERs is referred to as the ‘secondary CER market’, that is, exchanges of CERs already created by CDM projects. Actors involved in this market spectrum include project developers, who are using the income from CERs to make viable projects that might not, otherwise, come about, consultants working on the Project Design Document (PDD), which has to be prepared to get approval from the CDM Executive Board consultants on the methodologies to be developed and applied in a project, brokers, who bring together project developers and purchasers of CERs (or buyers and sellers of EUAs), firms, which validate the PDD for the CDM system and to verify the emissions reductions once the project has started, and lawyers, who draw up the contracts to purchase the carbon allowances or credits or devise contracts for derivative products.

Development and design of the European carbon market mirrored that of financial markets since the 1980s. Already in the 1970s, the US had abandoned its commitment to redeem debts in gold, allowing its deficits to swell. The Bretton Woods agreements had collapsed under the pressure of increasing international capital flows, and industrialised countries stopped using fixed exchange rates, stable interest rates and commodity price stabilisation (Koch 2006). To handle the emerging uncertainties of a transnationalised and deregulated business environment, credit derivatives could be used as a means against the exposure to supplier default. However, as Lohmann (2010: 227) points out, the new derivatives ‘involved social transformations undreamed of by conventional insurers.’ Capital and credit controls were assessed as ‘inefficient’, a ‘block to the growth of the liquidity that traders assembling diversified international portfolios needed if they were to provide a privatised solution to privatised uncertainty.’ Default risks were detached from loans and repackaged so that both could be bought and sold separately. Disembedded from local contexts, uncertainties were ‘separated and re-differentiated along various numerical scales to help create thing-like products tailored to the degree of risk-awareness of every investor’. New means of credit creation were invented at ever shorter intervals by new financial actors such as hedge funds, brokerages, private equity firms or financial products divisions, which tended to characterise the new arrangements as ‘efficient’ and ‘politically neutral’. Yet the task of ‘disentangling,

isolating, commensurating and “thingifying” uncertainties involved painstaking, innovative, contingent political work by a variety of interested authors, including regulators’ – mechanisms of commodification, which made a ‘wide range of unknowns market-friendly (sliceable, diceable, sellable, buyable)’, but which, at the same time, became ‘time bombs of ignorance’ (Lohmann 2010: 229). Paradoxically, however, the simplifications required for commodification ‘led to enormous complexity’ – partly due to unrelenting pressures on quants to come up with ‘one technical fix after another’ – the dangers of which were lucratively passed on to customers, governments and taxpayers (Lohmann 2010: 234).

In circumstances of a transnationalisation and financialisation of investment and the concomitant ‘liberalisation’ of national and international finance markets (Koch 2012: 89-101), it was far from coincidental that governments turned to financial ‘experts’ and quants in particular for advice in developing a market solution to CC. Indeed, Lohmann (2010: 236) notes that ‘some of the same *bricoleurs* and theorists have helped nurture both the financial derivatives markets and the carbon markets.’ Many of the major players in the financial markets were also becoming dominant in the emerging carbon markets including Goldman Sachs, Deutsche Bank, Morgan Stanley, Barclays Capital, Fortis, Rabobank, BNP Paribas Fortis, Credit Suisse, Sumitomo, Kommunalkredit, Merrill Lynch and Cantor Fitzgerald. Similarly to the derivatives markets, carbon markets came to rely on the assumption that ‘separating out various credit uncertainties from loans and injecting them into commodity circuits was mainly a technical matter for experts’, so that ‘climate benefit’ units can be separated from the ‘historical pathways and political and social movements involved in a transition away from fossil fuels’ (Lohmann 2010: 240) without further ado. And like uncertainty markets, carbon markets produce highly abstract commodities, ‘partly through quantist procedures characterised by suppression of unknowns, contested quantifications, and lack of transparency’. And, as the next section will demonstrate, just as uncertainty markets, they are ‘dominated by speculators’ and ‘vulnerable to bubbles and crashes’ (Lohmann 2010: 237).

Results and assessment of the EU Emission Trading System (EU ETS)

The EU ETS is the world’s largest existing ‘cap and trade’ system, accounting for 80% of the global carbon market, about half of the EU’s carbon emissions and covering some 11,000 installations (Böhm *et al.* 2012; Reyes 2012). So far, the EU ETS has been implemented in three phases or trading periods: 2005-2007, 2008-2012 and 2013-2020 (Brown *et al.* 2012). The start of the fourth trading period is scheduled for 2021. Procedurally, the EU ETS is an iterative process, which resembles other areas of European governance where ‘soft’ and ‘open’ methods of coordination rather than ‘hard’ regulation are applied.⁹ Member states draw up National Allocation Plans (NAPs), which must then be confirmed by the EU commission. In order to implement NAPs, member states allocate emission allowances to the relevant CO₂ emitting companies. Each member state establishes a national registry to which each installation is required to submit its emissions data. National registries are linked to the Community Independent Transaction Log that integrates all national systems under a European umbrella, issues allowances and registers accounts for each installation. In cases where allowances exceed allocated amounts, companies have to acquire additional allowances. Where companies improve their energy balance, they are entitled to benefit from

⁹ The European Employment Strategy, for example, is operated on the basis of a similar procedure (Koch 2008).

the sale of their superfluous certificates. A major problem in the initial phases of the EU ETS was that most countries had issued too many certificates to businesses (Brouns and Witt 2008: 68) and that the EU commission – contrary to emissions trading theorists such as Dales – issued about 95% of all allowances during the first trading period (2005-2007) and some 90% during the second (2008-2012) free of charge. The EU Commission targeted 50% of allowances to be auctioned in 2013, with a gradual increase of auctioning, reaching 100% in 2027 (Venmans 2012: 5495). Hence, far from consisting an incentive towards using renewable energies, the scheme has *de facto* been a source for windfall profits, particularly for electricity producers, who simply transferred the price of allowances, which had been allocated to them free of charge, onto their customers' energy bills, thereby 'transferring billions of euros from (intermediary and final) consumers to shareholders' (Venmans 2012: 5508). In addition, the over-generous allocation of certificates to companies in most of the EU member states allowed many companies to sell on superfluous CO₂ emission allowances on the international carbon markets resulting in further windfalls. Allocations under the ETS were made under the auspices of not endangering the global competitiveness of European companies and on the assumption that European economies would keep growing. Yet the post-2008 recession and subsequent stagnation reduced output and power consumption, leaving companies with a surplus of permits. Since these were mainly given out for free, the net effect is 'directly opposite to the scheme's theoretical intention: polluters can delay taking action by cashing in unwanted permits, while the over-supply means that the "price signal" that is meant to affect change has been neutered.' (Reyes 2012: 189) Reyes refers to 2011 EU Commission data indicating a 900 million surplus in permits for the second phase of the ETS, meaning that a 'significant quantity of permits will be carried over into the post-2013 period.' In fact, the surplus of carbon permits allows companies to 'bank' credits for use at a later date so that, according to Reyes (2012: 189), 'no domestic reductions will be needed until at least 2018.'

The result of the over- and gratis allocation of carbon emission certificates, which was provided in exchange for the support of the member states and industry groups, was a collapse of their trading price. The price for the emission of one tonne of CO₂ crashed from 30 Euro in April 2005 (Schreurs 2008: 29) to below 7 Euro in April 2012 (Venmans 2012: 5495). Such price volatility is not accidental but instead typical of energy commodities like crude oil and coal, whose prices are determined at the world market level and therefore depend on a range of largely unpredictable factors (including major economic crises) that are normally beyond the reach and scale of regional regulation. For example, demand for carbon allowances fell sharply in late 2008 and early 2009 as the recession reduced economic output, resulting in much lower emissions and consequently in a lower need for emissions certificates than expected by the EU Commission. The result was what the World Bank (2009) called 'cashing in on carbon during the credit crunch'. A mayor sell-off of EUAs started in September 2008 when companies realised that the allowances they had received at no charge were valuable assets, particularly in the midst of the financial credit crunch. The World Bank also reports that this sell-off was followed by a 'discernible increase in trading of EUA options (more calls than puts, on average), showing the intent of some installations to hedge any anticipated 2008–12 compliance exposure.' (World Bank, 2009: 8) Such developments raise serious questions about the effectiveness of carbon trading systems in providing stable economic incentives to emitters who are assumed to respond rationally to price signals. If such schemes are, in practice, unable to deliver the stable and/or rising carbon prices that emissions trading theorists deem necessary for long-term, low-carbon investment decisions – the internalisation of external costs – it is difficult to see why they should be preferred over

taxation or direct environmental legislation. Compared to the price certainty of a carbon tax, the high volatility of the carbon price increases the risk profile of low-carbon investments and hampers low-carbon technology development (Venmans 2012: 5508). Irrespective of the volatility in pricing per tonne, carbon prices have at no point in time been high enough to trigger behavioural change and technology investments.

The EU directive was linked to the Kyoto Protocol's 'flexible instruments' – JI and the CDM. The CDM is a carbon offset market enabling the most developed industrial countries and their companies to buy carbon credits from projects located in developing countries that are not legally bound to reduce their own carbon emissions under the Kyoto Protocol. These projects earn CER credits, which can be traded and sold, and used by industrialised countries to meet their emission targets. Recent CDM statistics indicate that carbon offsetting has become a rapidly expanding business. About 5000 projects are already registered and many more are in the pipeline; these projects produced around 2 billion CERs by 2012. Böhm *et al.* (2012: 1622) point out that between 2002 and 2010, the value of transactions in the primary CDM market was approximately \$27 billion of which a huge share went towards transaction costs, such as consultancy, banking and other service fees. While many EU countries appear to be on course to meet their legally binding Kyoto emissions reduction targets, they have, in fact, only managed to do so by buying carbon offsetting credits from developing countries. The equivalent of 100% from the second trading period and 33% from the third period was and is likely to be realised in developing and Eastern countries via Kyoto credits (Venmans 2012: 5508). Thus, rather than cutting their own carbon emissions at home, the EU ETS has encouraged companies to offset their obligations by paying poorer countries for the implementation of CDM projects. This has led to accusations that the 'EU is essentially "exporting" its legally binding carbon reductions.' (Böhm *et al.* 2012: 1622)

The *sine qua non* for CDM schemes to work is that they initiate projects to increase climate protection in developing countries in 'addition' to what would have happened without these projects, because if certificates are issued for projects that would have been carried out anyway, developed countries increase their emissions without any simultaneous emissions reduction in the CDM guest countries. The CDM Executive Board, an agency specifically set up by the UN for the approval of such projects, issues allowances based on the assumed difference between the hypothetical CO₂ emissions in absence of the CDM project – the baseline – and the amount of emissions under consideration of the project. The development of methods for defining 'additionality' and for evaluating the emissions-saving effect from these projects has hitherto been one of the CDM Executive Board's most time consuming and disputed activities (Trexler *et al.* 2006). As Lohmann (2010: 244) argues, another parallel to financial markets lies in the similarity of the tasks of financial quants, who 'disaggregate different kinds of uncertainty from their contexts', and 'carbon quants', who disentangle carbon offset projects from an imaginary 'baseline' by engaging in 'creative efforts to domesticate, simplify and quantify unknowns.' And just as different investment banks calculated different prices for the same collateralised debt obligation tranche due to the use of different correlation models, 'different offset experts, regulators and environmentalists offer different estimates of the number of carbon credits that a project should be allowed to generate.' (Lohmann 2010: 245)

Furthermore, evaluation studies show that 40% of CDM projects representing 20% of all CDM credits cannot prove that they would not have been carried out anyway (Schneider 2007). Manipulation and fabrication of data on the part of project applicants in order to achieve the

required results were far from being exceptions to the rule.¹⁰ This does not appear to be just an initial problem but inherent to a system that encourages project applicants to generate as many as possible certificates for the lowest possible costs. (Wara 2007) According to the European Commission's 2009 EU ETS Amending Directive, the amount of CO₂ emissions that can be accounted for as JI and CDM will increase significantly so that such credits can be used for up to 50% of EU-wide CO₂ reductions by 2020 – a questionable decision given the consistent methodological difficulties around the notion of 'additionality', the widespread distorted use and, in many cases, outright abuse of the CDM. Its immediate consequence is that more CO₂ can be emitted from the EU territory than previously, while it remains uncertain whether this surplus in emissions will indeed be compensated for by CDM projects outside Europe.

Another alleged virtue of carbon trading schemes put forward by neoclassical environmental economists is the notion that its operation requires less bureaucracy and has lower costs than, for example, a tax on GHGs. However, the amount of administrative work necessary for the implementation and running of an entire new set of institutions at global, European and national levels is far from negligible. Tasks include the measurement of emissions, the issuing of emissions rights, the registering of trades and trade platforms, the regulation of property rights, the validation and approving of CDM projects, enforcing compliance, ensuring and processing reporting and dealing with the widespread opportunities for fraud. Each EU member states set up a special government agency to monitor the scheme. A major concern is the impartiality of evaluators who are accredited and listed by the CDM Executive Board as Designated Operational Entities (DOEs). These first identify the baseline or business-as-usual scenario, and then subtract the greenhouse gas emitted under the project scenario from the baseline resulting in the amount of emissions saved. However, in the EU ETS, it is the project applicant who assigns a particular DOE for a proposed project from the list provided by the CDM Executive Board. These rating agencies develop a range of CDM projects and are always looking for follow-up orders (Witt and Moritz 2008: 95). There is an analogy here to the housing market bubble, where rating agencies positively evaluated a range of non-viable mortgage products before the onset of the 2008 crisis thereby contributing to its outbreak. Similarly, there is significant systemic pressure to produce positive evaluation outcomes within the EU ETS scheme, since the likelihood of being named as DOE by companies again significantly depends on their evaluation the last time round. The costs for the substantial administration of carbon trading schemes have hitherto been borne by the general public (the taxpayer), while the CO₂ emitting companies have contributed nothing so far. One can only speculate on the level of bureaucratic impact and the additional cost for taxpayers that an expansion of carbon trading systems to the entire globe would entail, but there is no doubt that these would be considerable, given that most countries – including major emitters such as China or Russia – currently lack the necessary monitoring equipment.

The final argument is that carbon markets help to introduce growth strategies based on technological innovation and renewable energies both in the developed and – via the CDM – the developing world. In the case of the developed countries and the EU in particular, this is unlikely given the oversupply of carbon allowances, constantly low prices for carbon emission certificates and the availability to cheaply outsource carbon emissions reduction duties via the flexible mechanisms. In relation to the developing countries, the evidence for the CDM as a means of spurring technological innovation and sustainable production is likewise weak. Apart

¹⁰ In relation to India, Michaelowa and Purohit (2007) point out that about every third UN-registered CDM project could not furnish plausible proof of additionality. Haya (2007) comes to a similar conclusion with regard to the building of hydroelectric power plants in China.

from the methodological difficulties and outright cheating in relation to the 'additionality' of projects, Witt and Moritz (2008: 96-7) have scrutinised the geographic distribution of CDM projects and found that, in 2008, 771 of 1033 registered projects were carried out in the four threshold countries: India, China, Brazil and Mexico. The majority of the developing countries, and in particular the poorest countries, represent a much lower percentage of CDM projects and therefore have limited or no access to the intended technology transfer. In countries that have poor infrastructures and a weak rule of law, transaction costs are comparatively high, making CDM projects costly and risky enterprises from companies' point of view. Hence, the vast majority of CDM projects are implemented in the so-called 'emerging markets', which also concentrate a great deal of Foreign Direct Investment (FDI) (Koch 2012: 102-10). In these countries, the necessity of attracting FDI provides policymakers with the twisted incentive of not implementing far-reaching climate-protection legislation at the national level, since doing so would violate the very basis that attracts FDI in the form of CDM projects. These have to be 'additional', and that which already has legal status can hardly claim additionality. Thus the lower the environmental standards, the greater the chances of authorisation for a proposed CDM project. Concerning the content of carbon-saving projects, Witt and Moritz argue that most of these are classical 'end-of-pipe' solutions: rather than cutting the flow of raw materials into industrial processes, the problem is tackled after the resulting waste has already been emitted. Marginal projects dominate, such as the containment of industrial gases by bolting on filters to already existing pipes, over the implementation of technological change based on renewable energies.

Conclusion or the need for a 'counter-counter-counter' movement

The transition from an environmental regulatory system based on Pigouvian taxation, which was typical for the post-war decades, towards one based on the commodification of carbon emissions, the artificial creation of private property rights as well as emissions trading as the main mechanism emerged as a part of a wider political and economic transformation in the course of which the idea that market forces with the accompanying (re-)commodification and privatisation of public goods are per se superior to any kind of state regulation and public ownership became the dominant worldview. In the light of these wider societal and ideological developments, it is far from coincidental that Voß (2007b: 114) diagnoses a 'fundamental transformation of basic structures of environmental governance', within which tradable permits and certificates of various kinds became state of the art. And like all major social transformation processes, the one from state regulation to market steering in environmental governance was accompanied by the emergence of new power relationships, interest groups and actors, whose common primary and very material interest it was that this emerging carbon markets continued to exist and to expand. And compared to this interest, the question of whether carbon trading contributes anything to climate protection was indeed secondary.

Assessed against the original policy goal of a decarbonisation of the global economy, real-existing carbon markets score poorly, since they are riddled with design flaws and characterised by pervasive weaknesses in implementation. The lever of any synthetic carbon emissions market is whether it is possible to create scarcity for permits such that price signalling can work. This completely failed in the first two trading periods and, due to the discussed design flaws and anomalies, is likely to fail long-term. While some observers regard the existing policy instruments as reformable in relation to their original aim (Wara 2007; Newell and Paterson 2010; Michaelowa 2011), an increasing number of authors see these market failures as inherent elements of the broader political economy framework of

contemporary CC mitigation efforts (Bäckstrand and Lövbrand 2006; Bumpus and Liverman 2008; Clifton 2009; Gilbertson *et al.* 2009; Lohmann 2011; Koch 2012). Indeed, given the extremely short timeframe within which CC mitigation policies would need to result in a peak of absolute carbon emissions (see *Introduction* above), the empirical test of the existing EU carbon-trading scheme in the previous section does not provide much cheer. There is no indication whatsoever that existing carbon markets can be re-regulated – let alone expanded to the rest of the world – in ways that would make a peak of global carbon emissions by 2020 a realistic possibility. Hence, compared to its regulatory alternatives – direct regulation and Pigouvian taxes – carbon trading systems are the least best solution, unlikely to result in the extent of ‘absolute decoupling’ of GDP growth and resource inputs and carbon emissions as identified by Jackson (2009: 48) that would be necessary to meet the IPCC climate targets. Worse still, the system’s existence creates the deceptive appearance that ‘something is being done about the issue’. By assuring that tackling CC does not contradict finance-driven capitalism, and that this issue is dealt with within its institutional structure, resistance and the establishment of alternative ways of working and living become more difficult. On top of allowing corporations and associated governments to manage CC at the lowest financial cost and to open up a range of new career and investment opportunities, the existing CC governance edifice has a detrimental impact at the individual level, where it undermines a transformation of the fossil consumption norm. Carbon-offsetting schemes are the pendant to the CDM for the individual consumer and offer a comfortable way of salving one’s guilty conscience by maintaining the illusion that CC can be mitigated without behavioural change (Splash 2010: 186-9).

Since carbon markets, which we interpreted here as part of the ‘counter-counter’ movement to the crisis of Fordism (*Introduction*), are unlikely to result in an absolute reduction in global carbon emissions in the foreseeable future, the scholarly attention not only of political economists should be turned to the contradictions and the associated spaces for resistance inherent to the finance-driven accumulation regime. Though a ‘counter-counter-counter’ movement is by no means an automatic outcome, Polanyi can be read in ways that the latest recommodification wave of labour, money and land – and of the atmosphere in particular – may result in a new round of societal self-defence. The parallels in emergence, expansion and functioning of financial and carbon markets and their structural interlocking suggest that effective CC mitigation policies cannot be enacted without a significant increase in public control over the finance sector. As Lohmann (2012: 181) argues, this includes the democratisation of decision-making procedures in this sector, particularly those that are important in determining ‘long-range energy and transport development’, which would need to be redirected from fossil fuels dependence and the search for fossil fuel substitutes towards ‘locally focused energy, locally adapted agriculture and locally appropriate transport’ (Lohmann, 2012: 178). The parallel commodification of, or the development of ‘market solutions’ to, socio-ecological areas and issues as disparate as finances, water, electricity, health and welfare services as well as the burning of fossil fuels suggests supporting movements aiming at their (re)decommodification; particularly, where movements struggle against fossil fuel extraction and advocate ‘national command-and-control emissions reductions strategies plus public works investments and regional/local utility and planning controls’ (Bond 2012: 686). Without overestimating the practical relevance of heterodox thought and succumbing to the ‘scholastic fallacy’ (Bourdieu 2000), political economists, social scientists and other intellectuals can play a potentially important role in such an alliance; especially, by developing economic and societal models that de-prioritise GDP growth and over-consumption as well as associated eco-social policies (Victor 2008; Daly and Farley 2009; Gough 2011; Koch 2013b; Koch and Fritz 2014).

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