Bridging "green" asymmetries through crises
How a Chinese green bond has landed in Portugal

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Abstract: The article examines the first Chinese green bond issued in Europe to explore how a green bond is created and how it can be issued across boundaries. Raising questions of "green" valuation at multiple scales, it follows the way the bond's proceeds hit the ground in Portugal, refinancing wind farms previously built under a Feed in Tariff (FiT) regime. It shows how if on the one hand green bonds are designed as abstract and fungible instruments, then on the other they are spatially situated and predicated upon the larger dynamic of global financial accumulation with its recurrent and contingent crises. In this context, the rush over renewables intersects with expansive Chinese financial monetary policy and the EU austerity process.

Keywords: China, energy crisis, financialization, green bonds, green finance, Portugal

Flanking the Atlantic in northern Lisbon, Ventosa is a *freguesia* (civil parish) of the Torres Vedras municipality, which supplies a large portion of Lisbon's energy. In Portuguese Ventosa means "windy," and it comes as no surprise to see the gigantic wind turbines redefining the landscape of the countryside. The small town has been nearly abandoned in recent decades. I stopped at the only open bar, which only serves the typical *torrada com manteia* (toast with butter) and coffee. Outside, three old men smoking cigarettes were talking. COVID-related restrictions had just been lifted after the first lockdown, but they appeared surprised to see a foreigner passing by. We exchanged a polite "*bom dia*" ("hello," lit. "good day").

Although it is only few kilometers from Lisbon's trendy coffeehouses, the place seems to belong to another era, anchored to a past and peripheral condition that cannot be reborn. It is in a prolonged state of crisis in which, besides tourism and the wine industry, there is no longer any economic center: the marginalization of agriculture has pushed younger generations to migrate to the cities.

Yet, the dense infrastructural deployment of the turbines that dominate the landscape suggests a very different path, a path that has positioned Portugal as a champion of renewable energy transition and has made Torres Vedras (and Ventosa) the vanguard of an industry that promises to live off the wind. In the last ten years, wind, a free and infinite natural resource that abounds in Portugal, has been harnessed by institutions working at the intersection of regional and national policies. Stewarding the

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Portuguese energy transition, these new partnerships will convert the local economy of rural communities through the deployment of technological infrastructures such as wind farms. This rush to capitalize on renewable energy, however, has also given way to the rise of financial instruments that benefit from translating the free, unlimited, invisible yet localized energy sources into financial streams that outstrip national, regional, and local precincts and create larger hierarchies of value at a global level.

This article explores how an instrument like a green bond can be issued across boundaries and how it "hits the ground" (Mezzadra and Neilson 2018). The subject of this article is the first Chinese green bond to be denominated in euros and to be certified and listed in Europe—the China Three Gorges (CTG) green bond. This was issued by the Chinese state-owned enterprise (SOE) CTG, currently investing in the refinancing of wind farms, the majority of which are located in Portugal. Starting from the premise that capital's aspirations to universality can only be enacted "in the sticky materiality of practical encounters" (Tsing 2015: 1–2), my trip to Ventosa and to other rural areas of Portugal was in fact aimed to track turbines refinanced by the bond and explore what the impact of the bond has been at local level. In this article, I will seek to maintain a parallel analysis of the abstract and the material, highlighting how they match and mismatch.

Linking to recent debates about the relationship between value and nature and the making of the new green asset class (Birch and Muniesa 2020; Bridge et al. 2020; Ouma 2020). I show that, as an instrument of the economic "valuation" of nature, green bonds might also perform as a vehicle for rent extraction (Greco and Apostolopoulou 2019) that should be explored both within and outside the boundaries of the formal apparatus of "green valuation." While raising questions on (green) systems of valuation on multiple scales, this case study covers financial and energy crises, and their "transitional" dimension. In this context, it emerges that, if on the one hand green bonds are designed as fungible instruments that can be traded across boundaries thanks to abstract pricing and combined systems of accounting, on the other hand they are spatially situated and predicated upon the larger dynamic of financial accumulation whereby the globalization of shareholding interests intersects (rather contingently) with an expansive Chinese financial monetary policy and the EU austerity process. As I will explain, the issuance of the green bond occurred "in between" a partnership between CTG and Energias de Portugal (EDP), the main Portuguese utility, with CTG acquiring majority shares in EDP during Portugal's austerity crisis.

I examine the CTG green bond as an ethnographic object and follow its "lifecycle." My findings result from interviews with the CTG green bond's makers and evaluators, as well as from conversations with members of the communities living in proximity to the wind farms financed by the bond. The fieldwork was carried out in Portugal during the first outbreak of the COVID-19 pandemic. This meant limited access to certain sites as well as limited chances to engage in what, in normal time, would have been more spontaneous and protracted conversations. However, as COVID-19 forced countries to shut down (Tooze 2021) and people's jobs became precarious, questions about energy supplies were amplified and became even more entangled with the public's preoccupation and growing discontentment with their financial situation. As I illustrate, issues of financial distribution and energy transition situate the green bond within complex social and spatial relations that call to recontextualize climate finance, not as a separate domain but as an inherent factor in larger financial forms of accumulation.

Green bonds' momentum

Born out of a combination of standard financial instruments, such as traditional bonds, and sustainability aims, green bonds have been "invented as a way to drive massive social and material change" (Brightman 2017). By attracting

investors from around the world, green bonds are allegedly unlocking a new "wall of money" across countries and sector and public-private alliances. Globally, the outstanding issuance of green bonds has now reached the cumulative amount of 754 billion dollars. The World Bank (2018) has defined the rise of green bonds as "history making" insofar as they are fundamentally revolutionizing the "way investors, development experts, policymakers, and scientists work together." As asserted by Aldo Romani, creator of the first 2007 climate bond, binding the means of finance to the moral imperative of sustainability opens up a new way of "capturing new investors' imagination" (Rees 2018).

This imagination responds to a global rush to address the "double crisis" of the environment and capitalism, whereby the green–finance dichotomy can now recondition the values of a "spectacle" (Bracking 2015; Sullivan 2013; Tsing 2005), disciplining expert bodies, market institutions, states, and natural resources within the web of financialization. In this rush, it is now expected that the inexorability of the environmental crisis can be disjoined and "liberated from the premise of an exogenous physical threat" (Janković and Bowman 2014: 233), and replaced by a new global market design. These mechanisms, however, are still far from achieving a common global consensus. As part of a never-ending search, the socio-technical aspects of the market that apply to climate finance need to be constantly defined, invoked, and reformulated to ensure that market efficiency is guaranteed through the contradictory intertwining of the market's spontaneous order (*kosmos*) and its unavoidable collapse into a constructed order (*taxis*) (Mirowski 2009: 425–426). This contradictory dynamic becomes even more critical when it seeks to design a market with sustainable and environmental purposes (Frankel et al. 2019). Market-based institutions and international organizations such as the International Capital Market Association (ICMA) and the Climate Bonds Initiative (CBI) have implemented a cacophony of standards and principles maintained by an increasingly assertive "audit culture" (Power 1994; Shore and Wright 2015).

As a regional actor, the European Union (EU) has elevated itself to the position of "the" guiding sovereign institution defining right and wrong in the green financial sector globally (EC 2019), playing the arbiter in the "unfathomable" world of climate finance (Felli 2014: 252). In line with a quintessential ordoliberal ethos, the EU taxonomy lies in the ambition of correcting market asymmetries via public interventions and governmental tactics so as to "naturalize" market mechanisms (Foucault 2008; Hayek 2006).

However, Chinese financial players have long developed their financial standards and regulations under the state's umbrella (Dal Maso 2019, 2020). Turbocharged by a combination of state capital, public guarantees, and tax incentives, the Chinese green portfolio is now one of the most active in the world, second only to that of the United States (CBI 2019), and China has so far issued green bonds (*luse zhaiquan*) with a total value of $48 billion. These respond to a unified strategic plan, including guidelines and criteria, that China has been following since 2007 under a pioneering green credit policy.[1] Importantly, as the state plans to create the world's most expansive "green financial system" with Chinese characteristics (Bruckermann 2020: 88), financialization appears to be the key driver of Xi Jinping's ecological civilization (*shengtai wenming*). Taking stock of the heterogeneity of these multiple market and normative regimes, this article seeks to shed light on the development as well as hierarchies and asymmetries of the global green bonds market.

Setting the stage

Antonio, a farmer who lives near a wind farm a few kilometers outside of Ventosa, told me that his family had been reliant on wind power through the use of windmills for generations. As we stood in the field next to his house, I noticed the stark contrast between the abandoned old

windmill and the gigantic turbine just next to it. Antonio explained that until the 1960s there were more than 10,000 mills still operating in Portugal. As living symbols of fertile land, mills acted as convertors of natural resources (wind or water) at the service of local rural communities for centuries and typified terms of exchange between the members of local communities. Farmers could rely on the miller's service of grinding grain by promising him a percentage of the final product, flour. The community, with its own power hierarchy, was dependent upon—but in control of—the wind.[2] Today, Antonio is not against the building of new turbines and integrating their technology. Yet, shaking his head, he stresses that the way wind has been used in recent years is for "god knows how many multi-layered financial and political purposes and my bills are high!" Antonio was right in identifying a pyramid of interests that are hard to track down. Some of the turbines near his house outside of Ventosa are in fact a part of the CTG green bond, which is refinancing them over the next ten years and guaranteeing fixed revenues to international investors.

The rise of green bonds responds to the wider trend that has seen the influence of capital markets over energy and renewables policies (Klagge and Anz 2014; Klagge and Nweke-Eze 2020). In Portugal, precursors of this process were waves of privatization and liberalization that changed the ownership structure of the main Portuguese public utility EDP into a shareholding company. EDP became a catalyst for the injection of new private and international funding streams into a sector that had been previously under the state domain. In this context, the issuance of the CTG green bond forms part of a larger reorientation of funding to decarbonize previously *public* infrastructure and invest in renewables technology.

In the transition from a public to a private utility, EDP underwent eight phases of privatization that started in early 1991 and culminated in 2011 with CTG acquiring most of the state's remaining shares.[3] As the Portuguese austerity crisis struck in 2011, CTG "came in," offering to buy the Portuguese government's remaining 21.35 percent interest in EDP. Before and during this process, EDP was transformed into a semiprivate company listed in Lisbon and New York. Featuring on the Dow Jones Sustainability Index for 12 consecutive years, EDP is considered the Portuguese leader in financial value creation linked with sustainability. As the company's production passed to shareholders' interests, the "presumption that internal funds should be used for [fixed capital] investment" no longer stood (Durand and Gueuder 2018: 130).

To grasp the significance of the CTG takeover, one has to look at the larger EU scenario. By following the 2009 EU renewable directive that sought to make 20 percent of the energy consumed within the EU by establishing targets among member states, Portugal's aim was to generate 60 percent of its electricity from renewable energy sources. At the same time, investment in renewable energy transition "was one of the flagships of the former Portuguese Government (2005–2011) as part of their ambitious 'Technological Plan'" (Delicado et al. 2017: 180; see also Delicado et al. 2016). While committing to this target, however, the country came under scrutiny from the EU and the International Monetary Fund (IMF) for its high government deficit and increasing debt levels, which were exacerbated by the global financial crisis.

In April 2011, as Portugal's financial situation worsened, the Troika (i.e., the EU, European Central Bank, and IMF) intervened. With the country hit hard by the austerity measures that led to mass unemployment and increasing debt (David 2018; Rato 2013), market measures and private foreign capital were quickly injected to guarantee a "restoration of confidence" (Dardot and Laval 2019: 114). This demanded significant structural reforms to consolidate government finances. In 2012, the country was compelled to eradicate its growing Feed-in Tariff (FiT) debt, and this was followed by a government moratorium on onshore wind-power and small-hydro FiTs with no new licenses be-

ing issued. Although the moratorium on licensing was lifted in 2013, projects were no longer entitled to public financial support. This led to a drastic fall in the country's wind-power capacity, which had reached 41 percent of renewable capacity in 2011 (Andreas et al. 2019). Portugal's renewable energy transition was hit by the convoluted austerity process.

As in other countries on the periphery of the EU, the way energy transition was handled in Portugal involved banks and other financial institutions directing private cash to the sector. In its transition from the *Steuerstaat* (tax state) to *Schuldenstaat* (debt state) (Streeck 2014), Portugal was subjected to the absolute power of financial institutions that, as both lenders for states and recipients of (public) money that prevents them from collapsing, "embody at once the role of creditors and debtors" (Mezzadra and Neilson 2018: 214; see also Balibar 2013). Following the dictates of Europeanization that subjected the country to a subaltern status, the entry of Chinese capital came "to the rescue" of the Portuguese energy sector. Through the "carrot and stick" dynamic that characterizes the EU core-and-periphery relationship, CTG was then able to acquire 49 percent of EDP[4] Renewables (a subsidiary of EDP) and bring in new capital (including the green bond) to develop 422 MW through the financing and refinancing of new and existing wind farms. The operation indirectly made the Chinese SOE benefit from the previous FiT policy that had ensured Portuguese investment in wind and solar power. In a way, CTG eased the finances of EDP to enable the renewable energy transition that the country had previously started under encouragement from the EU, which then later withdrew its support.

EDP has been under the spotlight for some time in Portugal. Rui, a member of an environmental association very active in the renewable energy sector, told me that as previous public utility and the country's main energy provider EDP is a company with which the Portuguese have a love–hate relationship.[5] The love started soon after the Carnation Revolution in the mid-1970s until the first wave of privatization, when EDP became the state company in charge of managing the country's energy system.[6] As the main Portuguese utility, EDP guaranteed a path dependence similar to what Timothy Mitchell (2011) described between the rise of legitimate US democratic political power and the biopolitical norms of Keynesian welfarism—a path dependence that in many countries was based on the inexhaustible provision of a resource and endless growth (see Boyer 2019). During these years, EDP worked in tandem with the government, benefitting from generous state subsidies to maintain controlled energy prices for the people.[7]

These subsidies were maintained during the transition to free market competition and have never been discontinued. Yet Portugal's energy poverty kept rising, especially in rural areas (see Horta et al. 2019; Sareen 2020), where turbines are usually built. The love gradually transformed into dissent, which became even more intense when CTG came in and injected even more money into EDP. In fact, CTG's acquisition of EDP did not translate into more equally distributed energy "provision." Rui explained that the taking over of EDP by CTG triggered a huge debate in Portugal: it meant losing the state's control of one of the most powerful energy companies and the handing over of said company to another nation, as CTG is a Chinese SOE. Although EDP lost part of its public consensus in the moment of privatization, it still benefits from inheriting a past condition of monopoly in a regime of free competition. According to Rui, the paradox is that even though EDP is now owned for the most part by the Chinese, which makes it unpopular, the service is still what people choose because "it once was 'public,'" which infuses it with a certain reliability when compared to the newer, smaller, and lesser-known providers. Besides his activities in the association, Rui also has a small business that produces photovoltaic panels. Rui tells me that not many people understand how much EDP is growing in financial operations and attracting investors, as they issue green bonds and

sell green certificates to other big companies or energy providers in Europe. This is an invisible result of the process of privatization and liberalization encouraged by the EU.

Like other members of the community, Antonio laments that he has not seen any benefits from this huge new wind industry. Although he is appreciative of the technological power the turbines showcase, he finds that they have overtly altered the landscape without delivering any benefits to local people.

Although it is often used to describe unwanted externalities and spillovers from ambitious energy transition processes through market-based pricing, the term "overflowing" (Callon 1998, 2004) might not be the best way to address the poverty gap exacerbated by the Portuguese energy transition. Below, however, I will explain how this is mirrored by a story from China concerning market "overflows."

Chinese wind turbines attack

CTG's extraversion to the Global North was a response to an internal crisis that hit China's energy production transition. While benefitting from the uneven configuration of supply chain capitalism (Tsing 2009), the burgeoning clean energy sector in the Global North has outsourced production to China and other cheap mass producers (Christophers 2016; Knuth 2018). As the story goes, the West holds all the high technology and expertise, China boasts cheap and skilled labor, which makes it a giant energy-manufacturing leader and net exporter. Despite its focus in the last few years on economic growth (which has worked to the detriment of its environmental objectives), China is seeking ways to flip this hierarchy by ensuring its own clean transition.

In her investigation of the Chinese wind energy sector, Julia Kirkegaard (2018) has shown how, in less than a decade, China was able to move from zero wind power to being one of the world's largest wind-power markets. She describes, however, the difficult and straggled phases of this trajectory. As part of a "boom-bust-and-survival" model, this path involved what Kirkegaard describes as three distinct phases: a "turbine wave attack," a "quality crisis," and an ongoing "turn to quality," in which China looked to upgrade technologies and sought alignment between wind power and sustainable and scientific development at a global level (Kirkegaard and Caliskan 2018). The initial phase involved a quantity-based system for the "promotion of renewable energy through state-led auctions" (2018: 7). This was then followed by a second phase that saw the Chinese Renewable Energy Law "introducing a mandatory grid-connection system and feed-in tariff scheme" (2018: 7) and that drove even more investment into the sector. The insufficiently monitored and uncoordinated rapid growth took the form of a "wind turbine wave attack" (a phrase that brings to mind China's ancient military tactic of a "human wave attack") that, because of the lack of quality turbines and other components (Kirkegaard and Caliskan 2018; Klagge et al. 2012), ended up compromising production.

Thus, despite the abundance of capital and the scale of investment, in 2011 China underwent a quality crisis that concerned wind production. The state's strategy of quantitative growth at all costs led to the development of wind farms irrespective of their quality and strength or connectivity to the grid, thereby creating a true process of market breakdown and overflow. As a way out of this "creative destruction," the Chinese state pushed for the domestic development of certification requirements and access standards (Kirkegaard and Caliskan 2018: 8; Lewis 2012) both to discipline the market and to encourage Chinese integration with international research and technology networks.

The crisis that China experienced was different from the one experienced in Portugal. Portugal was an overindebted country, but, because of substantial infrastructure, expertise, and the international ramifications of its wind power production initiated by public investment, it was also on the verge of becoming a global leader in

the renewables market (Sareen 2020: 47). Meanwhile, China, whose own debt was increasing, could count on the state's capital liquidity, yet was lacking standardized technology and expertise in wind-power production. Under Xi, China has actively sought to both align itself with and shape international norms and institutions (Economy 2018) while looking to affirm Chinese-led globalization. In 2011, the partnership between CTG and EDP was subjected to the wider international division of labor under financial accumulation. Here, energy transition, fiscal policies, and technological changes were blended within the lateral space of global finance. Under multiple crises, the integration of these factors intensified.

Against this background, both a dissonance and a complementarity between the financial and energy crises that respectively hit Portugal and China lie at the heart of the financial entanglement that later culminated in the CTG acquisition of EDP. It is in the space opened up by these multiple crises that the CTG green bond was issued. As the partnership was consolidated, CTG was seeking ways to increase its EDP shares. Fast forward five years to the CTG–EDP partnership and CTG's issuing of the green bond to refinance EDP Renewables' infrastructure. This provided a cheap way for CTG to not only guarantee a liquidity line for its partner, but also to gain accountability as a potential major shareholder in the EU.

CTG bond(s) to Europe

Typically, a green bond's lifecycle is composed of multiple stages. These go from underwriting and book-running, to post-issuance green-auditing and ultimately to the bond maturity process. Often the first step involves the issuer selecting green assets that meet environmental parameters. When an institution issues a green bond, it also releases a framework. An auditor or accountant (typically one of the "Big 4") then assesses the green assurances of the issuer (second-party opinion) and releases certification and verification statements that attest to whether the bond project (green assets) has met specific validity criteria (third-party verification). One of the most salient differences of the Chinese green bonds market is that it maintains different "green" standards respective to the different actors it regulates (Faske 2018). For example, the main Chinese Green Bond Endorsed Project Catalogue issued by the People's Bank of China (PBoC) directly addresses Chinese issuers and policymakers and not "financial market participants," as the new EU taxonomy is intended to do. This makes Chinese climate finance governance both a unique and fragmented space where interactions between private and public are contingently negotiated ad hoc, depending on the state objectives, actors, and projects involved.

CTG was not new to the green bonds market. However, its previous green bonds were issued within the "protected zone" of the Chinese domestic green bond market through the financing and refinancing of its own hydropower infrastructure. Instead, the CTG green bond with EU characteristics had to follow the formal "Western" auditing process, as I have described above. The framework of the CTG's green bond issuance process states that proceeds are to be allocated to wind-power projects, the bulk of which are onshore wind farms in Portugal, some other farms in Italy, and an offshore wind project in Germany. In the case of Portugal, the wind farms were previously constructed by EDP Renewables, the project's refinancing of which (€650 million for wind projects) is set to save more than 2,200,000 tons of CO_2. The bond's verification was assessed for compliance with bond standards and instruments established by CBI. As prescribed by CBI, CTG then had to employ a verifier, in this case Ernst & Young (EY), which provided an external review and issued an assurance report on the project.

Although EY is a transnational institution with offices all over the world, and the projects selected and managed through the bond belonged to EDP Renewables in Europe, the bond was

issued through CTG subsidiary Three Gorges Finance III based in the Cayman Islands—this meant that the bond's financial operation was orchestrated and certified (assurance) in China. The extent to which the geography of accounting outstrips the environmental criteria under which the green bond is conceived is striking. This makes audit increasingly linked to its role of "arbitraging" among geographically rooted regional authorities in the growing fragmentation of global accumulation, instead of being increasingly focused on independent examination (Kalaitzake 2019: 10). In practice, the verifier only assesses the company's capacity to provide reliable (albeit very limited) *data and information* on the bond's selected green projects, but does nothing to test the actual environmental impact/risk of the selected assets. This process provides the issuer with an endorsement and additional green value branding that enables it to have greater accountability and thus consensus to potentially acquire investors' trust.

After all of this, it may appear paradoxical to learn that the ultimate actual financial risk of the bond is not eased by this process (see Bigger 2017). In fact, the bond is ultimately backed by the issuer's balance sheet. It is the underwriter(s), typically an investment bank(s), who takes on the risk by deciding on the pricing and by selling the bond to investors. In the case of CTG, the underwriter is composed of a group of banks and financial institutions (a syndicate) that includes the PBoC (as syndicate leader). Compared to the seven-year ordinary Euro bond CTG had issued in 2015, this green bond profited from "price benefits"—a *greenium*—that the company was able to add to "lower interest rates and tighten spread, which translated into annual cost savings of EUR3 million, and an aggregate amount of EUR21 million" (CBI 2017). But again, was this performance really due to the environmental features of the CTG "green" bond? In the end, what really counted when defining the price was the bond's financial rating, which was set by a private credit-rating agency like Moody's and Fitch Ratings. Being a Chinese SOE, which means relying on secure state liquidity, the bond obtained an A1/A+ rating and was then listed on the Dublin Stock Exchange with a 1.3 percent coupon rate. In June 2017, the CTG Euro green bond issuance attracted investors from all over the world and was 3.1 times oversubscribed.[8] In the end, for the market, the country of risk was not Portugal but China. That CTG is the biggest Chinese hydropower operator and the company behind the most controversial human interventions in the history of Anthropocene—the building of a dam made out of 21 million cubic yards that has been blamed for its devastating socioeconomic and environmental consequences for the Yangtze River (Jackson and Sleigh 2000)—was not considered in the CTG green bond valuation.

A green "aura" out of the crisis

Thus, constitutive of the CTG bond are valuation practices that not only abstract the sustainable green features of the bond's green projects into quantifiable entities (estimated CO_2 reduction through wind power expressed in MWs), but that also bind these features to the accountability and responsibility of the issuer through codified registers and financial credit ratings. CTG received a "green light" to adhere to a climate finance apparatus that thus far had gained its legitimacy through sound science and its validation through the "tyranny" of data disclosure (Maxwell 1881: 419; Mirowski 1992; Muniesa 2014: 40). This meant meeting sector-specific criteria that codified carbon emissions reductions through wind-power plants as indicated by the CBI taxonomy. In this act of compliance, the CTG green bond aligned itself to Western-led sustainability reporting whereby the issuer proves its "sustainable aims" through public accountability and documented "certified" audits (Liu et al. 2019).

Produced and guaranteed by the kind of solidarity between the Western modern economy, industry and scientific abstraction that White-

head holds responsible for the current state of affairs (Toscano 2008: 72; Whitehead 1967), the *iter* of certification that defines the bond's lifecycle regime ensures the making of the "green" financial market conventions and their performativity (MacKenzie 2004; Marazzi 2008). Based on "the incipient promise of pure numbers—constants free of the mundane fetters of space and time" (Mirowski 1992), the abstraction that this financial projection provides to investors and financiers is a "conflation of representation and exchange" (Poovey 2003: 27) that investors and financiers seek to chase, "bolstering particular interests and political economy structures while occluding others" (Sullivan and Hannis 2017: 1461).

Given this background, I characterize the CTG as having two streams of value and thus performing a sort of double "assetization": one that corresponds to the bond *per se* as an intangible asset, which is attuned to the conventional formal process of green bonds valuation explained above, and one, imminent to the first, that revolves around the financing of tangible green assets (the wind farms) that allow the issuer to capitalize from the indirect acquisition of infrastructures that temporarily place ownership "rights" into the issuer's hands. This emerges out of the above familiar story that generates rentier types of extraction from processes of state privatization triggered by debt and austerity policies that I have described. As I have shown, such extraction results out of the dynamics that culminated in the two crises and, far from representing an on–off historical momentum, reflects the way finance operations are leveraged and unfold along the spatial and historical asymmetries that sustain its ongoing reproduction.

Both processes, however, are built on the shaky ground of energy transition, which visibly leverages the invisible and infinite potential of natural resources like wind (Franquesa 2018, 2019). For most of the members of the rural communities of Viseu, where many of the CTG bonds are located, wind has always been an essential resource and part of their life. Cinzia, the owner of a local restaurant who also works in a vineyard in the area, told me that wind is one of Portugal's secret resources. She explained that wind has indirectly contributed to the flourishing of the wine and tourism industry. Wind is considered the secret ingredient of Portuguese wine and has a role in every season: in the summer, it has a cooling effect, slowing the ripening process and giving flavor to the grapes. In the wet season, it helps dry out the plants, preventing mildew. In winter, it prevents frost damage. From wine production to grinding grain, pumping water, and generating electricity, wind has always been an abundant and shared common good. Now, although the turbines coronating the valleys of Viseu were initially funded with public money to boost technological power and make this resource even more valuable and available, it seems that they have created winners and losers, excluding local populations from the benefits generated.

Conclusion

In recent years, the awe over renewables has legitimized multiple forms of new financial and political interventions. Green bonds have been part of this trend, providing an infrastructure for "green" contract arrangements, aligning issuers and investors with principles and parameters that establish a new market-making model. Due to the diversification of these parameters (and their application), the market has rushed to overcome information asymmetries in order to develop a global green bonds market that speaks a universal language. This case study has shown how this exercise seems rather futile. While exploring how a green bond is issued across boundaries, it turns out that these instruments are instead deeply attached to hierarchical and contingent financial interests and their historical premises.

As the intersection of multiple crises (financial, energy, climate, and overaccumulation) reveals, the case study has unraveled the paradox that capital valuation is "precisely made by

continuous speculative positions" that, while overpassing "the need of objective standards" (Konings 2018: 36), leverage on uneven relations of power fueled by intersections of crises and austerity policies. As I have shown, the auditing and techno-economic rituals that ensure green bonds are capitalized, are sustained by historical, political, and fiscal hierarchies and relations (Ortiz 2020; Powers and Rakopoulos 2019) that underpin green bond issuance in the first place. This process unequivocally unifies the financial and the material.

Yet, as the global green finance apparatus seeks to produce a homogeneous language of financial valorization, there might be a risk that, the moment the "measured measure" of the green bonds market convention becomes the "measuring measure" that allows the extension of the chains of intercomparison, we might find ourselves in front of a "different [often hidden] phenomenon than the one they believed they were observing" (Latour and Lépinay 2009: 20). To the point, the green standards seem to encourage the emergence of a financialized and technocratic "environmentalism" (Antonello and Howkins 2020; Bina 2013; Castree and Henderson 2014) that is increasingly detached from the "terrain" in which it operates.

As this case study has shown, behind the financial, technical, and thus paraded political neutrality of global standards for climate change mitigation lies hidden questions of "energopolitics" that should invite us to rethink the political, social, and ecological dimensions of moving from fossil fuels to renewable energy (Boyer 2019). This calls for examining the rise of green finance and energy transition not only against the common tendency of capital to capitalize on crisis (Arrighi 1994; Krippner 2011; Mirowski 2013), but also against the backdrop of new frontiers for extraction seeking to enclose "the commons" (De Angelis 2017; Federici 1992). If finance can be conceived as a tool to tackle climate change, we need an approach attentive to local forms of knowledge-making that can better grasp specific "frictional encounters of finance and nature" (Ouma et al. 2018: 501).

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Notes

1. This has seen the People's Bank of China (PBoC), working in chorus with the China Banking Regulatory Commission (CBRC), and the Ministry of Environmental Protection (MEP) (SBN 2018). In addition, China paraded the first green bonds classification through its state organs, most prominently the PBoC, the National Development and Reform Commission (NDRC), and the China Securities Regulatory Commission (CSRC).
2. During the first half of the nineteenth century, Lisbon became the European capital with the largest number of mills in its territory; there were more than one hundred, but they were still insufficient to supply the entire population.
3. During the most salient phase in March 2007, the group made a $3 billion takeover of Horizon Wind Energy, the Texas-based wind-power producer. EDP became one of the first Iberian energy groups to have assets on both sides of the Atlantic and the fourth-largest wind-power producer in the world.

4. With CTG acquiring EDP and the Chinese State Grid (another Chinese SOE), obtaining 25 percent of Portugal's national power grid, Portuguese energy production was revamped.
5. Interview, Lisbon, April 2020.
6. First, it ran the main Portuguese coal power plants in Sines, and then it managed natural gas through a long pipeline from Algeria. As a result, Portugal had energy thanks to EDP.
7. The main subsidy still in place is Custos para a Manutenção do Equilíbrio Contratual (Costs for the Maintenance of Contractual Equilibrium) established in 2007.
8. Buyers were from Germany, France, Switzerland, the United Kingdom, Italy, Norway, the Netherlands, Portugal, Spain, United Arab Emirates, Singapore, South Korea, Japan, and Malaysia.

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