Tech-based Prototypes in Climate Governance: On Scalability, Replicability, and Representation

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Abstract

'[T]he "mainstream" of global governance has changed course' and in so doing, might well have 'outrun the standard tools of critical, progressive, and reform-minded international lawyers', Fleur Johns wrote in 2019. It is especially the critical tools of 'appeals to history, context, language [and] the grassroots' in response to universalist planning that Johns sees absorbed in the turn to prototyping as a new 'style' of governance. In this article, we take on this observation and explore how the 'lean start-up mentality' that Johns described has taken hold of tech-based climate governance. We base our reflections on the 'Tech for Our Planet' challenge that took place over 2021 and was showcased at the UNFCCC COP26 in Glasgow. While a turn 'from planning to prototypes' is observable, we question how exactly this 'change of course' affects the high modernist style of global governance and its critique by international lawyers. The 'digital solutions for climate challenges' that were showcased in Glasgow are indeed based on localized experiments with data science, thereby seemingly overcoming high modernist impulses towards universalist ideals. Yet, these experimental prototypes are developed with the ambition of being replicable and scaled up, to become a stack of tools deployable in any given scenario. This form of scaling up neither breaks with modernist aspirations based on technologically-mediated replicability—of moving the same logic inscribed in code to different sites and contexts—nor with a modernist understanding of knowledge as universal in its application. In our analysis, the determining feature is then not so much a matter of planning *or* prototyping in ideal type forms, but of replicability of knowledge production and scalability of technological know-how that underpin both planning *and* prototyping. Prototyping in the start-up space does not depart from, but rather reinscribes, a modernist representation of the human subject that forces its epistemological lens onto a world of nonhuman objects amenable to governance. Critical international lawyers' toolkits must therefore be reconfigured with a focus on a governance style of disembodied knowledge production that runs through both planning and prototyping.

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Introduction

'Those old nemeses (and beloved dancing partners) of international legal scholarship—the state, international institutions and other vectors of "top-down governance"—have learned some new steps, picked up some new rhythms and routines' (Johns 2019, p. 834). The new steps, rhythms and routines of international institutions that we explore in this article are those of the 'digital age'—the new challenges and opportunities that emerge with new technologies and their promises to govern, sense, and experience the world differently.[1] As Fleur Johns observed, a change of aspiration took hold of global governance institutions, with law- and policy-making now being 'informed by business development methods that prefer prototypes over plans' (2019, p. 833). These governance languages and sensibilities are, according to Johns, driven by a business methodology known as the 'lean start-up mentality' (2019, p. 855).[2]

Johns draws on James Scott's notion of *mētis* knowledge to describe this shift from planning to prototyping and characterizes this new 'style' of governance as embracing 'localism, practical know-how, historical specificity and grassroots insight and productivity' (2019, pp. 857–858). According to Johns, international lawyers have aspired towards and invoked variations of *mētis* knowledge when critiquing and unveiling dynamics of 'error, domination, and hubris' embedded in global governmental planning. For Johns, therefore, if this shift to a 'lean start-up mentality' in contemporary governance practices is akin to a form of *mētis* knowledge, modes of critique in the register of Scott might be 'reaffirming, rather than proposing alternatives to, the way that states and international institutions now aspire to see and govern' (2019, p. 862). Indeed, the 'new ways of seeing like a state' that Johns observes in the turn from planning to prototyping seem to have metabolised the critiques of reform-minded legal scholars and are now working with, rather than against, adaptive, bottom-up, and *mētis* know-how. This observation lies at the heart of Johns' call upon international lawyers to revise their toolkits of critique if they are still to attend meaningfully to governmental 'initiatives' deficiencies and unintended consequences' (2019, p. 836). The invitation calls for a response on two levels. First, it demands to inquire into the distinction between planning and prototyping as different 'styles' of governance in relation to Scott's critique as articulated within Johns' framework. Second, it demands to think further about what critique in international law could look like if the current governance framework, which approximates something as '"*mētis*-friendly institution[s]" effectively forestalling the kinds of critique and reform for which Scott advocated' (2019, pp. 842–843), actually perpetuates a modernist developmental discourse and participates in the unfolding of an

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[1] On the resulting shift towards a 'governance by data', see also Johns (2021).

[2] In reference to Ries (2011).

ecological catastrophe that is part of this 'style' of governance. Our analysis focuses on a particular site where these two elements of response come into play, namely the 'Tech for Our Planet' challenge.

The Tech for Our Planet challenge was showcased at the United Nations Framework Convention on Climate Change (UNFCCC) 2021 Conference of the Parties (COP) 26 in Glasgow—a mainstream site of global climate governance (Tech for Our Planet 2021). The challenge invited start-ups to 'pilot technology that will help us reach our net zero targets', with the purpose of 'showcas[ing] how digital and data solutions can make a major and essential contribution to the global climate effort' (Tech for Our Planet 2021). In studying this initiative, we see a resemblance to Johns' description of the governance style of the Global Pulse Lab Jakarta—one driven by schemes of bottom-up experimentation, creativity, and prototypes. More specifically, the *mētis*-based style of governance that Johns describes, inspired by Scott, is acquired through 'local knowledge' gained in a 'concrete situation' based on 'specific adjustments for local conditions' and continuously adapted through iterative processes of 'successive, self-correcting approximations' (Scott 1998, pp. 316–319). Yet, how different is this style of governance through prototypes from the high modernist governance through planning that Johns invokes in contradistinction, in reference to Scott?

We attend to this question by showing how the start-ups participating in the Tech for Our Planet challenge are indeed experimenting in localized environments, yet aspire to develop their technological solutions by replicating them at a global scale. This universalist aspiration to scale up the 'digital solutions for climate challenges' and replicate the prototyped knowledge globally—a replicability that operates like 'copy-pasting'—blurs the lines between prototyping and planning. Inspired by strands of posthumanist critique, and particularly Rosi Braidotti's framing of 'critical posthumanities'—as a convergence of posthumanism and anthropocentrism where the former is a 'critique of the humanist ideal of "Man" as the allegedly universal measure of all things, while the latter criticizes species hierarchy and human exceptionalism' (2019, pp. 31–32)—we observe how the form of prototyping that is enacted in the start-up space of the COP26 reproduces what Scott saw as a form of *tēchne*-based high modernist planning. Scott described this as 'a strong, one might even say muscle-bound, version of the self-confidence about scientific and technical progress, the expansion of production, the growing satisfaction of human needs, the mastery of nature (including human nature), and, above all, the rational design of social order commensurate with the scientific understanding of natural laws' (Scott 1998, p. 4).[3] We therefore base our intervention on the resonances and the

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[3] Scott defined *tēchne* as a 'technical knowledge' that 'could be expressed precisely and comprehensively in the form of hard-and-fast rules' (1998, p. 319). Note that throughout this article, we will work with the notion of '*tēchne*' as understood and described by Scott, and not with its broader and more ancient Aristotelian definition. For an engagement with '*technē poiētikē*' as 'creative arts […] involving a true course of reasoning concerning making' or, in other words, 'a certain *know-how-in-a-certain-way*' that combines a particular mental disposition and a process of doing, whereby '*technē poiētikē*' is then viewed as an 'actualizing [of] some human conceptualization of the world, [which] is not necessarily theoretical [*epistēmē*]', see Judy (2020, pp. 191–196) (who retrieves these Aristotelian understandings of technical know-how and theoretical knowledge and applies them to black modes of sociality or, in Judy's words, to forms of '*poiēsis* in black'). Interestingly, Judy speaks of '*mêtis*' as 'fleshly intelligence'

differences that run through Scott's development critique, Johns' invitation to reconsider the 'critical toolkit' of international lawyers, and a posthumanist critique of global climate governance by casting humans and 'nature' as separate, independent, and autonomous entities, with the former mastering the latter.[4]

The main argument the article advances is that from a critical posthumanist point of view, the dynamics of knowledge replicability and technological scalability that lie at the heart of tech-based climate governance are key for reconsidering the stakes and styles of critique in prototypical times. This perspective complicates the dichotomy between Scott's notions of *tēchne* and *mētis* and, by extension, the dichotomy between John's planning and prototyping. Arguably, the notions of replicability and scalability are squarely located in a modernist mode of knowledge production, yet applied on such contextual level that it makes them seem to differ from other more familiar tools of planning (such as statistics, indicators, or targets). Against this backdrop, we argue that a productive mode of contemporary critique of prototyping in global governance needs to engage with the pre-supposed possibility to replicate measuring apparatuses or phenomena, thereby presuming an inert, inactive and passive environment.[5] By inquiring into the aspirations towards replicability of know-how and scalability of tech-solutions, we attempt to understand what particular act of representing human-nonhuman relations operates as a pre-condition for the intended 'copy-pasted' replication of knowledge and uptake of prototyped technologies across contexts and geographies. Where does this leave critique in relation to global climate governance?

The argument unfolds in three steps. We start by analysing the UNFCCC COP26 Tech for Our Planet challenge to explore how the 'lean start-up mentality' that Johns described is taking hold of tech-based climate governance, especially in the contemporary socio-technical space of UN hackathons. We then inquire into the aspirations that underpin the projects that were showcased by start-ups at COP26 in relation to the different modes of knowing that Johns and Scott associate to planning and prototyping. Against this backdrop, we contend that a more fruitful entry point for critique of global climate governance is rooted in posthumanist theories that side-step a disembodied vision of reality.

Footnote 3 (continued)

(2020, p. 242), a point to which we will return through the notion of '(dis)embodiment'. Judy equates this 'fleshly intelligence' to 'a cunning of fleshliness that presents a danger to the purity of white *epistēmē*', which becomes evident when 'we take into consideration that the French rendering for the Greek *mêtis* is *métis*' (2020, p. 436).

[4] As mentioned above, we relate to Braidotti's framework loosely and invoke other feminist posthumanist thinkers like Donna Haraway and Karen Barad. Their works differ in significant ways, however, with regards to the 'copy-pasted' style of replicability and scalability, we see their approaches converge around a critique of disembodied knowledge production.

[5] By 'representation', we refer to the traditional tripartite system of representation whereby 'in addition to knowledge (i.e., representations), on the one hand, and the known (i.e., that which is purportedly represented), on the other hand, the existence of a knower (i.e., someone who does the representing) is sometimes made explicit' and, consequently, 'representations are presumed to serve as mediating function between independently existing entities' (Barad 2007, pp. 46–47).

The 'Lean Start-up Mentality' of UN Hackathons for Climate Governance

The UN set its priority clear when it comes to innovation—'Innovation, as we approach it, means iterative design', before quoting Eric Beinhocker (Executive Director of the Institute for New Economic Thinking at the Oxford Martin School) in larger font and bold: 'Rather than thinking of strategy as a single plan built on predictions of the future, we should think of strategy as a portfolio of experiments that competes and evolves over time' (United Nations Development Programme Innovation Facility 2017).[6] It should therefore come as no surprise that the hope invested in technological innovation through experimentation plays a major role in tackling climate change, as instantiated in the run up to the UNFCCC COP26 that took place in Glasgow. Over 2021, the Cabinet Office of the British government partnered with PUBLIC—a corporation that 'champions the use of emerging technologies and start-up solutions in solving public problems and improving the lives of citizens' (PUBLIC 2021)—to explore and showcase how digital and data solutions can make a major and essential contribution to the global climate effort. Together, they set up the Tech for Our Planet challenge, which was introduced as 'an exciting new opportunity for startups to pilot technology that will help us reach our net zero targets' (Tech for our Planet 2021).

Akin to a hackathon, the challenge-focused event encouraged experimental innovation by inviting start-ups to immerse themselves into climate change-related problems to try-out prototyped solutions. The purpose of hackathons, which are in vogue in global governance, is to develop new ideas, expose governing authorities and international institutions to new tools and skills, and reconfigure problems and solutions in a different light (Chandler 2017, p. 124). In this spirit, the objective of Tech for Our Planet consisted in committing leading start-ups to apply their cutting-edge digital and data solutions to five climate challenges, ranging from tracking and reducing energy consumption to encouraging more sustainable behaviours, land use and waste management, as well as greening financial services (Tech for our Planet 2021).[7] The overall objective was to catalyse partnerships and new ways of working to achieve net zero goals. A shortlisting of 'best' solutions took place over May and June, followed by an interview process in July 2021. From August to October, ten selected start-ups were invited to work with external partners on rapid

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[6] The reference comes from Bargués-Pedreny and Schmidt (2019, p. 65) for whom the governance of climate change is today best captured through a 'whatever action' approach, which speaks to the 'relentless putting forward of diverse initiatives which have uncertain outcomes, thus combining in an oxymoronic manner the notion of contingency – "whatever" – and the notion of purpose – "action"'.

[7] The titles were 'In Our Homes', asking 'How can we use technology to drive behavioural change and more sustainable consumption habits in our homes?'; 'In our Plate', asking 'How can we use technology to promote more sustainable land use and waste management practices on our farms?'; 'Thinking Smart', asking 'How can we better capture and share energy consumption data across the grid?'; 'Engaging Communities', asking 'How can we use technology to allow local and international communities to have their say on climate priorities and initiatives?'; and 'Green Finance', asking 'How can we use technology to make financial services greener?'.

pilots to demonstrate the value of their technology.[8] In November 2021, each start-up pitched and showcased its prototype at the COP26 itself.[9] In the follow-up of the event, start-ups will continue working with HMG—the world's leading digital platform that connects Chief Investment Officers, Chief Technology Officers, and Chief Information Security Officers from well-established companies with the purpose of investing into innovative early-stage technology (HMG Strategy 2021)—to bring their solutions to the market (Tech for our Planet 2021). By facilitating encounters between start-ups and investors, the goals of Tech for Our Planet were fourfold, namely to (i) 'develop and pilot innovative solutions to some of our most pressing challenges to bring net zero visions to life', (ii) 'inspire hope among communities to encourage behaviour change and a new generation of climate innovators', (iii) 'showcase the best of entrepreneurship and create export opportunities for cutting-edge companies', and (iv) 'encourage innovative technologies to tackle key climate challenges identified, for a better future in the UK and around the globe' (Tech for our Planet 2021).[10]

The ten selected start-ups suggested varying 'digital solutions for climate challenges', ranging from a database on insect biodiversity through the deployment of a network of low-cost sensors able to map the sounds of insects for farmers and gardeners to better manage their land and support an optimal pollination environment; to the creation of an AI-based autonomous, predictive and self-adaptive heating ventilation and air conditioning system; or a web-based tool that provides easy access to Earth observations to detect changes, map trends, and quantify differences on the Earth's surface through satellite remote sensing, thereby generating contextualised 'hotspots' of environmental change.[11]At first sight, these technological experimentations unfold through 'bottom-up' approaches to governance—one key characteristic of the 'lean start-up mentality' that Johns described (Johns 2019, p. 858). Indeed, all 'digital solutions to climate challenges' that were proposed are emplaced and developed by companies that experiment in a localized context. The overall objective, in other words, is to test the prototyped solutions in concrete situations, to adjust and adapt the results depending on particular conditions and responses on the ground (2019 p. 843). This bottom-up, experimental, and iterative approach characteristic of the 'lean start-up mentality' was seen by Johns as 'something approximating "mētis-friendly institution[s]", effectively forestalling the kinds of critique and reform for

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[8] The fast-paced tempo is important to notice here. As Irani has argued, in addition to an increasingly conformist circulation of values and values-laden technologies that hackathons produce, Irani alerts to the politics of inclusion and exclusion that underpins such organizational processes: the 'managed urgency' of hackathons enables fast entrepreneurial software building, but excludes the slow time of coalition building and democratic debate (2015, p. 801).

[9] The winning project is BrainBox AI, 2021 at <www.brainboxai.com>. The project provides tools for improving energy efficiency.

[10] Note that this is the core activity of PUBLIC, which also co-organizes the yearly GovTech Summit that brings together 'the world's brightest technological innovators with Europe's leading public sector decision makers to rethink how governments operate in a digital world, shaping the public services and markets of the future', at <www.govtechsummit.eu>.

[11] A presentation of all the start-ups during COP26 is available at <www.youtube.com/watch?v=4e7st uyuuRU>.

which Scott advocated' (2019, pp. 842–843). In the next section, we complicate this understanding by delving into the pilot projects that were showcased at the COP26 Tech for Our Planet challenge to show how they work with both planning *and* prototyping as styles of governance.

On 'Copy-Pasted' Replicability, 'Lego-Like' Scalability, and the Blurring Boundaries of Plans and Prototypes

Upon closer look at the Tech for Our Planet challenge, the ambition of replicating knowledge appears as playing a central role in the development and investment in digital and data solutions. With the overarching goal of '[e]ncourag[ing] innovative technologies to tackle key climate challenges identified, for a better future in the UK and around the globe', the possibility to replicate the prototyped solutions globally is crucial (Tech for our Planet 2021).

Whilst the vision of the Tech for Our Planet challenge is ultimately oriented towards the market to 'create export opportunities for cutting-edge companies', this goal falls under the overall objective of the UNFCCC to accelerate the uptake of climate technologies. Tellingly, on 21 September 2021, the Technology Executive Committee created under the auspices of the UNFCCC in 2010 to enhance climate technology developments and their transfer to developing countries, met in anticipation of the COP26 and agreed on a set of three policy recommendations (UNFCCC 2021). The first recommendation consisted precisely in 'stimulating the *uptake* of existing climate technologies' by examining innovative ways of 'scaling up promising climate solutions in developing country markets' (UNFCCC 2021). At stake in these aspirations for tech-based climate solutions being 'taken up' are also questions of climate justice and the imperative to 'transfer' technologies often developed in the Global North to countries from the Global South, which bear most of the immediate costs of climate adaptation and mitigation whilst having suffered disproportionately more under the exploitative world-ecology that brought about climate change in the first place.[12]

This question of technological transfer, however, is intertwined with issues of replicability of knowledge. The scalability of technological solutions, which rests on the assumption that a particular know-how is replicable in a 'copy-paste' mode, has become a key concept in tech-based entrepreneurship. Scalability describes to what degree 'an application or service can handle increased throughput in terms of more users, more computations, more input/output while still delivering the same performance or end user experience' (Bridgewater, 2020). This imperative of 'more'— of scaling up and of (economic) growth—has become a marker of success in tech-based entrepreneurship, also within the UN climate governance framework. The aspiration towards more users, more computations, and more input/output is held

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[12] 'World-ecology' is a reference to Moore's (2015) definition of the capitalist world-economy as enmeshed in a 'world-ecology' of wealth, power, and nature.

together by an assumption of sameness regarding both the conditions and implications of the technological tools deployed.

Replicability and up-scaling beg important questions regarding the assumed material and agential dispositions that underpin such processes. By aiming at sufficiently mastering the 'digital solutions for climate challenges' in order to generalize and export them, prototypes are not unlike planning. This has to do with the particular modes of knowledge production and knowledge transmission that operate as preconditions for the export and the transfer of the experimental prototypes. This can be observed in how the tech-developers or start-ups representatives sell their solutions and advocate for a global uptake of their products. From the perspective of the start-ups, the world consists of potential clients and users that must be identified in order to develop a product geared towards their interests. The replicability of know-how and scaling up of prototypes is turned into the smallest common denominator between potential clients on the market.

To take one specific example from the Tech for Our Planet challenge, the showcased prototype called 'Earth Blox' proposed to build user-friendly tools for earth observations that enable easy access 'to detect changes, map trends, and quantify differences on the Earth's surface through satellite remote sensing', thereby generating 'contextualised "hotspots" of environmental change' (Earth Blox 2021). The repository of Earth Blox' data contains a multi-petabyte catalogue of satellite imagery and geospatial datasets generated by Google Earth Engine. Earth Blox' selling point is that it makes this data available through a drag and drop menu: if you are interested in deforestation in Germany, for example, then the software will provide you with images that have been coded as containing relevant information, integrate them into a dashboard with colour coded graphs, and produce some statements in response to your inquiry. The multiple translations that have to take place from producing satellite images in particular computational languages, saving them in particular formats, and developing call functions that conjure a particular set of images, are all rendered invisible. What is produced instead is a presumably direct line between a search term—already a linguistic representation of a particular worldly phenomenon such as deforestation, for instance—and a set of satellite images coded, tagged, and defined as revealing something about deforestation. While promising to offer 'contextualised "hotspots" of environmental change', the images assembled through and mediated by Earth Blox actually decontextualise environmental change in multiple ways, thereby enabling the technological knowledge to travel across contexts.

Tellingly, Earth Blox defines its mode of knowledge production and knowledge utilisation as a 'LEGO-like' approach. In the words of the Earth Blox's developers themselves: '[a]s new information becomes available daily, Earth Blox gives you the flexibility to create and customise your own solutions. It's as simple as LEGO, just for satellite data' (2021). Despite the invocation of the notion of 'context', and whilst the prototype sheered away from a top-down, universal, and one-size-fits-all solution by generating 'customized solutions', this specific mode of knowledge production comes closer to Scott's category of *tēchne* rather than *mētis* knowledge. Indeed, for Scott, *tēchne* operates as a reasoning that is 'organized analytically into small, explicit, logical steps and is both decomposable and verifiable' (Scott 1998,

p. 320).[13] According to Scott, the universality of such knowledge—in addition of it being 'impersonal' and 'completely impervious to context'—lies in the fact that it presents 'self-contained systems of reasoning in which the findings may be logically derived from the initial assumptions' (1998, p. 320). The knowledge thus acquired is supposedly the same 'everywhere and forever' (Scott 1998, p. 320). The know-how that is produced through such a 'LEGO-like logic' rests on independently existing entities—or pieces of a LEGO construction—that serve as interlocking and 'modular' building blocks that can be dis- and re-assembled in different ways, by different people, at different times, and in different places.[14] The common units involved in each building block—the LEGO blocks—are always, as Scott puts it, decomposable and verifiable, and can thereby travel and be redeployed around the globe.

The very belief in the capacity to replicate knowledge production in a 'copy-pasting' way rests on a 'tripartite arrangement' of the system of representation that posits the knower as observing subject; the known as object of observation; and knowledge as a mediating representation of the observed entity, with the goal of recreating this representational arrangement in another context (Barad, 2007, pp. 46–47). A specific representation of a particular being-world relation gets idealized in this process, with the expectation of replicating it across scales, regions, and contexts. To return to our example of the Earth Blox prototype, the representation of a being-world relation and the human and nonhuman actions that compose it are those between the users of satellite data (the knowers as subjects), the earth observations that enable easy access to detect changes, map trends, and quantify differences on the Earth's surface through satellite remote sensing (the knowledge that serves as mediating representation), and the contextualised hotspots of environmental change that are thereby generated (the known as object). The ideal of replicating the know-how used to translate satellite data into contextualised hotspots of environmental change—and thereby scaling up the technology of Earth Blox—pre-supposes a possible repetition of the same tripartite system of representation, where the technologically mediated knowledge enables the knower subject to know the known object. In a world of global but customizable technological solutionism, the aspirations for 'copy-pasted' replicability of knowledge and the 'Lego-like' scalability of technologies centralises power within the technology developing companies.

Thus, as much as the prototypes showcased at the Tech for Our Planet challenge appear to be context-specific and emplaced, since replicability and scalability are foundational to their design, they reproduce a form of *tēchne* knowledge in assuming that the same stack of technological tools can be deployed everywhere to produce knowledge about specific sites. The specific sites are furthermore rendered as passive environments—as a bundle of nonhuman objects knowable to the knowledgeable human subject. This is due to the particular modes of knowledge production and

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[13] In contrast, Scott defined *mētis* knowledge as a 'kind of knowledge that can be acquired only by practice and that all but defies being communicated in written or oral form apart from actual practice' (1998, p. 315).

[14] This 'block'-like approach aligns with the 'modular organisation form' described in Lang and Desai, 'From Mock-up to Module: Development Practice between Planning and Prototype', *Law and Critique* (in this special issue).

knowledge transmission that operate as pre-conditions for the export and the transfer of the experimental prototypes. This, we argue, has less to do with planning *or* prototyping—nor with a sequence *from* planning *to* prototyping—but with a blurring of the boundaries between the two, since a particular mode of 'copy-pasted knowledge' production animates *both* planning *and* prototyping. This style of knowledge production rests on a modernist mode of representation, to which we turn in the next and final section.

Governance Styles of Distancing, Detachment and Disembodiment

The replicability of knowledge production by 'copy-pasting' it elsewhere rests on an ideal of 'legibility' of the world that Scott described as arising from an 'administrative ordering of nature and society', which reduces messy complexities to measurable and manageable objects of knowledge (Scott 1998, p. 4).[15] Such 'forms of knowledge and control' require what Scott defined as a 'narrowing of vision' or a 'tunnel vision', which 'brings into sharp focus certain limited aspects of an otherwise far more complex and unwieldy reality' (1998, p. 28). This simplification, in turn, makes the phenomenon at the centre of the field of vision 'more legible and hence more susceptible to careful measurement and calculation' (1998, p.11). As Scott deplored, this 'tunnel vision' generates a 'synoptic view of a selective reality … making possible a high degree of schematic knowledge, control, and manipulation', which is symptomatic of a high modernist representation of the world and how to inhabit it (1998, p.11). The knowledge so produced is not bound to any particular space or time. This characteristic is the pre-condition for it to be replicated at scale.

The assumption that a particular knowledge production can be replicated—or reproduced and recreated *as such*—disregards the specific material conditions from which that knowledge came into being in the first place. Haraway described such knowledge as playing a 'god-trick' of pretending to see 'everything from nowhere' (Haraway 1988, p. 581)—a 'God's-eye view' also critiqued by Scott (Scott 1998, p. 4). In this form of knowledge production, the reliance on replicability and scalability of technologies that mediate relations between humans and nonhumans in particular ways further reinforces the fantasy of endlessly enhanced disembodied visions of reality (Scott 1998, p. 4). This 'synoptic view of reality' precludes a 'direct *material* engagement with the world', where matter is understood as 'a dynamic expression/articulation of the world in its intra-active becoming' (Barad 2007, p. 49, emphasis added).[16] This disembodiment sits in contrast to *mētis* know-how as 'valuable knowledge *embodied* in local practices' (Scott 1998, p. 6, emphasis added). Indeed, *mêtis*, as Judy articulates in a different register, is a 'fleshly intelligence'—a 'type of somatic thinking' (Judy 2020, p. 242).[17] It is precisely due to the inherent disembodied nature of *tēchne*

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[15] See also Yunita et al. (forthcoming 2023).

[16] The neologism 'intra-action' (in contrast to the usual 'interaction') signifies the mutual constitution of entangled human-nonhuman agencies (Barad 2007, p. 33; pp. 392–393).

[17] Judy borrowed the concept of *mêtis* as 'somatic intelligence' from (Hawhee, 2005).

that Scott saw it as pertaining to disciplines 'that exist as realms of pure thought, untouched by the contingencies of the material world' (Scott 1998, p. 321). This disembodied sense of 'seeing everything from nowhere' without direct material engagement with the world is further reinforced, and perhaps perfected, in the desire to scale prototypes across space and time.

To come back to Johns' interrogation about 'styles of counter-conduct or converse knowledge-practice' (2019, p. 844), if critical scholars have indeed traded traditional and long-term planning for short-sighted and experimental prototyping, the 'learn start-up mentality' that has taken hold of global climate governance still depends on modernist modes of knowledge production. In attending 'closely to styles of governance […] and how they seem to be in the process of shifting, in potentially enduring ways' (Johns 2019, p. 840), it is this style of observing from an assumed outsider perspective that enables replicability, uptake and scaling up of solutions to be deployed around the globe. In this sense, the move from planning to prototyping that Johns describes remains a mode of governance through observation, through disembodied seeing, as also indicated in the subtitle of 'new ways of *seeing* like a state'. What is at stake in the quest of rethinking modes of critique for critical international lawyers can therefore only be attended to by understanding this disembodied vision as a style of governance. With invoking style as an analytical lens, Johns clarifies that she is concerned with style 'not just in language or artefacts', but rather 'plainly concerned with more than text or materialised signifiers of other kinds' (Johns 2019, p. 840). In is with this invocation that Johns seems to be aligned with our claim that critique of mainstream climate governance must challenge the very assumptions of knowledge production that underwrite the lean-start-up style of governance.

In the socio-technical space of UN hackathons, the mode of representation that start-ups deploy to activate the possibility of knowledge replicability, builds and distributes a particular future with inequitable conduits of powers nested in the commodification of tech-based know-how aimed at being scaled up. A template, a script, or a manual for deployment of technological know-how are envisioned as guarantees for the dis- and re-assemblage of prototyped solutions for climate challenges at a global scale—or rather, on a global market. The underlying logic of start-ups to commodify this know-how by scaling up their prototypes rests on a problematic representation of the world and of the human and nonhuman relations that compose it, which might well reinforce, rather than bypass, a disembodied planning mentality that conceives of knowledge production and knowledge transmission as 'untouched by the contingencies of the material world' (Scott 1998, p. 321). This affordance of tech-based prototypes in climate governance privileges a commodity-style mode of knowledge production characterized by goals of replicability, up-taking, and scalability of (localized) know-how, which sits uncomfortably with both styles of critique that Johns developed—or rather, makes them relevant both *at once*. These reflections open up important avenues for further critique of entangled modes of knowing and acting in the world. It is to these avenues for critique we now turn in the form of a conclusion.

Conclusion

If the pilot projects showcased at the Tech for Our Planet challenge fall back onto a form of universalist knowledge and the prototypes turn out to be another version of planning, then what are 'the Faustian bargains being newly struck' behind this 'style' of governance, and what difficulties may this pose for critical scholars and practitioners of international law (Johns 2019, p. 859)? In this article, we argued that a productive mode of critique of tech-based climate governance needs to engage with the notions of replicability of knowledge production, scalability in digital technologies, as well as the epistemological product now commodified through a 'lean start-up mentality'. This critical orientation aims to break open representational modes of knowing that hold the world at distance. It tracks the multiple, grounded and diverse ways in which we are becoming knowing subjects.

Thinking with Johns, what is the role of critical scholars engaging with the limitations, simplifications, and reductions at play in tech-based climate governance, as well as the violence concomitant with the assumption of a detached and unconcerned 'outside' world? Could 'new ways of seeing' be configured by attending to the materialist-relational aspects of knowledge production that post-humanist and materialist accounts have proposed? Could tech-developers relate differently to data and information, by utilising their potential to contribute to the construction of models attuned to particularities, without falling back onto high modernist ideals of knowledge replicability and technological scalability as processes of 'copy-pasting', analogy, and application of the same onto the different? (Gandorfer Forthcoming 2023) What are the potentials and the dangers that come with digital technologies, and how can one detach such technologies from capitalist understandings of value-market relations? While we cannot offer answers to these questions here, we wish to end this article by emphasising that, while tempting, the notion of scalability as used in the 'lean start-up' space must not be confused with spatial scales of local *versus* global when invoking bottom-up, localized, and contextual knowledge. Rather, the notion of scalability—including its economic implications and epistemological assumptions—reinscribes high modernist aspirations by applying a 'copy-paste' logic across scales under the pretext of progressive climate governance. In fact, contrary to what is frequently claimed in contemporary climate governance discourses within and outside the academic space, the question does not revolve around the local as context, but around the stakes and violence of representationalist modes of knowledge production, now increasingly embedded and commodifiable within technocapitalist markets.

Given that what is at stake in tech-based climate governance is nothing less than questions of how to keep existing on Earth, we side with Johns that the critical repertoire in global governance must attend to the 'new steps, new rhythms and routines' within such spaces (Johns 2019, p. 834). To this end, thinking about the (im)possibility for start-ups to replicate and to scale up the particular human/nonhuman and subject/object relations that underpin their prototypes becomes the key entry point for developing critical responses to tech-based climate

governance. If critique is to direct itself to the impossibility of an outside position for knowledge production and understands itself as 'limited location and situated knowledge' (Haraway 1988, pp. 582–583),[18] this also means acknowledging and reckoning with the inevitable partial reproduction and complicity in the problematic modes of governance that the very critique aims to address.[19] Instead of assuming 'a posture of critical sanctimony, or lay claim to being uncompromised or beyond complicity' (Johns 2019, p. 863), it is down in the materiality of particular practices that 'new ways of seeing' are enacted—ways of seeing that mark what matters and what is excluded from mattering.[20]

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[18] 'So, not so perversely, objectivity turns out to be about particular and specific embodiment and definitely not about the false vision promising transcendence of all limits and responsibility' Haraway (1988, pp. 582–583).

[19] With Massumi, we suggest that traditional modes of critique are themselves geared toward 'mastery and judgment' and thus, to a certain degree, rehearse the universalist tendency they set out to critique. '"Critical" practices aimed at increasing potentials for freedom and for movement are inadequate, because in order to critique something in any kind of definitive way you have to pin it down. In a way it is an almost sadistic enterprise that separates something out, attributes set characteristics to it, then applies a final judgement to it – objectifies it, in a moralizing kind of way' (Massumi 2015, p. 15). From an agential realist perspective, we follow Barad's interrogation about how critique can take place when the 'critic' (the observer, the knower) stands inside the phenomenon that is being evaluated, and the critic's own positionality is determined by and determining of the apparatus that produces this phenomenon (Barad 2007, p. 146).

[20] This invitation also informs two other contributions in this Special Issue to: Gandorfer, 'Down and Dirty in the Field of Play: Startup Societies, Cryptostatecraft, and Critical Complicity', *Law and Critique* (in this special issue).

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