
1 Nexus-thinking in international political economy: what energy and natural resource scholarship can offer international political economy

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1. INTRODUCTION

2016 was the warmest year yet recorded on Earth. It was also the year that brought to power an outspoken climate sceptic in the United States. The Trump administration is seeking to roll back restrictions on extracting and burning fossil fuels in the country, while Exxon Mobil's CEO, Rex Tillerson, has taken up a senior cabinet post. At the same time, China emerged as the world leader in solar production, and made headlines with the announcement of hundreds of billions in additional renewable power investment up to 2020, cementing its role as the world's largest investor in domestic low-carbon energy sources. It was also China, and the US under the outgoing Obama administration, whose timely ratification of the Paris Agreement gave important momentum to the United Nations' flagging climate process. Meanwhile, falling crude prices were watched with great concern in Berlin and other European capitals, as faltering oil revenues threatened to further destabilise fossil-fuel dependent economies across Africa and the Middle East, exacerbating already crisis-level migratory flows. Finding themselves short on cash, Saudi Arabia embarked on plans to transition its economy away from oil resources, and Russia sold off parts of Rosneft, the state-owned oil crown jewel, to Glencore, a Swiss energy trader. The EU, reacting to both the pressing climate challenge and persisting insecurity with regard to Gazprom's energy supplies, fleshed out the governance structure of its, so far, largest joint energy project, the Energy Union. On financial markets, a growing global divestment movement reached Wall Street with some major banks and insurance companies starting to go short on coal assets.

As these few examples drive home, the international political economy (IPE) of energy is yet again in a stage of global transformation. Clearly, this is not only a matter of policy. By contrast, it is incumbent upon IPE as a discipline to properly conceptualise these dynamics and make sense of them in the broader IPE realm. Scope, therefore, clearly exists today for additional academic studies of the contemporary IPE of energy and resources. The reproduction of world economy relations is now routinely confronted by the often intractable politics of securing access to a wide range of resources; the drive towards constituting a distinctively low-carbon economy with its particular implications for various energy carriers; and the ongoing institutional reconfiguration of both the demand- and supply-side of international resource markets. Tensions, transitions, confrontations, urgency: these words now typically provide the everyday political language in

which debates about energy and resource provision are conducted. This is why resource and energy issues resonate with such relevance.

Against this backdrop, this *Handbook* on the IPE of energy and resources offers both an introduction to the current state of political economic thinking in this subject area, and an analysis of key intellectual themes arising from that thinking which talk directly to prominent discussions within IPE. Following this introduction, the *Handbook* contains 25 chapters, in a 'short chapter' format, focused on thematic areas of energy and resources, including water, food and minerals. The book offers a 'crisp' treatise of these areas authored by select scholars, from multiple disciplinary backgrounds, who are authorities in their respective areas. Chapters typically elaborate on the distinct 'IPE-ness' of the respective theme, point to key dynamics pertaining to the theme, and offer conclusions on the academic frontiers it opens up for further scholarly investigation. The material is selected as a taster in the range of thematic and conceptual materials available in the IPE of energy and resources, as well as engaging with a diverse range of empirical cases.

2. ENERGY AND IPE: THE STORY SO FAR

It can be argued that much energy scholarship, whether it realises it or not, is grounded in IPE as a discipline. Gilpin's (1987) three core approaches to IPE – liberalism, mercantilism, and Marxism – effectively cover many of these debates. Liberal IPE, beginning with Adam Smith's 1776 *The Wealth of Nations*, provided a set of questions with direct and ongoing relevance to the study of energy and resources. Notably, the operation of supply and demand in competitive markets, establishing necessary (minimum) levels of government intervention to support the operation of markets, the benefits of specialisation and trade (Ricardo 1817), managing the distribution of resources as a separate question to that of production (Mill 1848), and the futility or otherwise of trying to address issues of poverty (Malthus 1798). These questions remain central in contemporary liberal IPE, and within its main variant, (neoclassical) economics, even if the analysis and answers to such questions have changed. Crucially, there was no need for such approaches to directly engage with energy issues – for liberal theory, all goods can be treated equally, just as they are treated equally by impersonal market mechanisms.

The mercantilist response precisely focuses on this equating of goods. It differentiates between different types of goods: primary, agriculture and resource extraction; secondary, industrial manufacturing; and tertiary, service sector, goods. The political economy of energy and resources is very clearly placed within the primary goods category, and will exhibit the structural characteristics thereof. Indeed, the object of mercantilist policy is very clearly to diversify economies away from primary production towards secondary goods, which are deemed to have a range of advantages (see Hamilton 1791 and List 1841), not least due to different 'terms of trade'. Protectionism and other trade and industrial policies which states might practise are justified by mercantilism in these terms while national industrial growth and economic development strategies outweigh the liberal objective of maximising global, aggregate levels of economic wealth through free trade. Energy resources, particularly coal, are cast here as the fuel of the burgeoning industrial economy, and so take on strategic importance, not simply for national economic power, but for the military might which this underpins. This necessitates a much greater

role of the state in managing these resources – but the same role regarding energy as for any strategic resource.

Critical IPE asks a different set of questions altogether, concerning the ownership of economic assets, including energy and resources, and concerning the stability of the global economic and trading systems under capitalism. Generating systemic crises, capitalism constantly disrupts production and destabilises the social system in which production takes place (Marx 1867). Commodity price fluctuations and crashes, along with deep inequalities in access to energy, would be an expected outcome. In practice, it was not only communist states which emphasised national government ownership of key energy resources to address this problem, though more avowedly reformist variants chose to emphasise government management and regulation of the private sector economy to ensure acceptable social outcomes (see Keynes 1936). Concerns with the distribution of wealth, particularly as Europe's welfare state moved away from its conservative roots and towards the social democracy of the post-war era, led to the creation of large energy utilities providing energy services to entire populations. Polanyi (1957) called for markets to be subordinate to the norms and values of society, opening the door for a range of critical environmental positions in relation to fossil fuel and nuclear energy production technologies. Again, the state is a key actor here, required to address both domestic regulatory requirements and redistributive politics across a range of issues, of which energy is included, but without any particular 'public goods' characteristics to distinguish it from other policy areas.

Clearly, there is a world of difference between the applicability of long-standing traditions in IPE to energy, and an actual IPE of energy, which can conceptualise energy as a distinct subject matter. Indeed, none of these approaches really sees energy outside of the liberal IPE framework of commodity, the mercantilist IPE concept of primary good and strategic good, or the critical IPE conceptualisation of energy as an issue for domestic socio-economic management. The revival of IPE in the 1970s, furthermore, did little to bridge this divide. It is ironic, therefore, that this revival can in part be credited to the OPEC oil crises that restored the links between the global economy and national military power in the minds of an important set of IPE scholars (see Cohen 2008). Gilpin (1987: 193), indeed, counts the rise of OPEC as one of seven key transformations of the 20th century. Yet, his *The Political Economy of International Relations* is more concerned with commodity cartels and the role of recycled petro-dollars in various global financial dislocations than with any significance that energy or resources might have for IPE per se.

It was left to the more iconoclastic Susan Strange to set out the case for energy as a potential fifth pillar of global structural power (albeit a 'secondary' power structure) in her (1988) *States and Markets*. Yet, her analysis largely focuses on the interaction between energy and the security dimension, which largely subsumes the productive and financial angles, and while Strange moves beyond state actors, it is only as far as corporate actors. Little surprise, then, that in general terms IPE followed Gilpin rather than Strange. Energy was left as an essentially technical subject, relegated to the realm of policy-makers and practitioners, to economists and to engineers. Energy remained conceptually ill-defined and poorly understood in IPE terms, as numerous scholars have pointed out over the last decade (see CEPMLP 2006; Keating et al. 2012; Kuzemko 2013; Van de Graaf et al. 2016a). Economists and liberal IPE scholars continued to focus on markets and marketisation processes to the exclusion of other concerns, with interest in the two

oil shocks primarily because they caused economic recessions. Meanwhile, geopolitical realists and mercantilist IPE scholars continue to focus on power, though not structural power, military and diplomatic conflicts, oil 'regimes' and the resource curse – with oil, or other resources such as diamonds primarily of interest as a source of conflict (Blackwill and O'Sullivan 2014; Colgan 2013; Klare 2015).

Nevertheless, there have been notable recent shifts towards the recognition that energy and resources can offer distinct analytical constructs and empirical contexts. The most high-profile strand of this literature focuses on global energy governance, a term comprising a diverse set of writings interested in the international architecture of energy regimes, institutions and practices. Challenging the realist stance on energy politics, Goldthau and Witte (2009; 2010a; 2010b) construct a rule-based notion of global energy relations, focusing on how institutions may facilitate cooperation. Florini and Sovacool (2011) by contrast focus on the gaps in global energy governance. A related strand of literature approaches global energy as a matter of public policy, often borrowing concepts from neoclassical economics such as market failure or public goods (Goldthau 2011; 2013; Karlsson-Vinkhuyzen et al. 2012). Meanwhile, Lesage et al. (2010) highlight the role existing players such as the G20 or the International Energy Agency (IEA) can play in fostering a more effective energy regime in an increasingly multipolar world. Going deeper into regime theory, Colgan et al. (2012) model the energy conundrum as a regime complex, conceptually linking the energy debate to long-standing discussions on climate change (Biermann et al. 2010; Keohane and Victor 2011).

Yet this literature, for all its acuity, remains very much an, albeit more nuanced, reflection of these core IPE approaches, as well as of the neo-neo synthesis in mainstream international relations (IR). Consequently, it has been criticised for its continuing weakness in conceptualising the political economy of energy, from a range of institutionalist, sociological and discursive directions (Keating et al. 2012; Kuzemko 2013; 2014a; 2014b).

Indeed, the past decade has seen not only a growing interest in energy in the social sciences (Sovacool 2014), but also the direct engagement with energy issues by IPE scholarship with an eye towards a distinct IPE of energy. In particular, in their explicit attempt to 'bring energy into IPE', Keating et al. (2012: 4) identified four core characteristics of IPE that underpin the diverse energy scholarship collected in their book:

- (1) An interdisciplinary approach.
- (2) Engagement with a multiplicity of actors and institutions.
- (3) Recognition of the systematic interdependence of global, regional and domestic 'levels'.
- (4) Openness to diverse methods and normative concerns.

The emergence of an IPE of both energy and energy transitions can be dated to around this point, with other notable efforts including DiMuzio 2014; Baker et al. 2014; Kern and Markard 2016; Kuzemko et al. 2015; Van de Graaf et al. 2016a; or Goldthau and Sovacool 2012. Not all of this scholarship – or the work collected in edited volumes – seeks to address all four of these characteristics at once. Rather we see constellations of IPE of energy scholarship, branching out from energy into one or more of these directions. By recognising the complexity and multi-faceted nature of energy, comprising aspects as

different as legal constructs, technology, physical infrastructure and market design, these works are as a rule interdisciplinary. Kuzemko et al. (2012), for instance, conceptualise Eurasian energy relations in terms of governance dynamics, deliberately opening up the debate to legal, economic or sociological approaches, as well as explicitly looking for scholarship that can cut across the so-called 'levels of analysis' by going 'beyond domestic contexts' and dealing with 'transnational dynamics'. Global energy issues have also been recognised as being intertwined dilemmas (Bradshaw 2013), or challenges (Kuzemko et al. 2015), recognising the problem posed by reconciling security imperatives with sustainability and economic development (Cherp et al. 2011) – thus opening the IPE of energy up to a range of normative concerns. Exploring the 'external face' of the regulatory state, Goldthau and Sitter (2014; 2015a; 2015b) assess the EU's dealings with external energy challenges and in so doing explicitly address a range of actors and institutions. Within this emergent scholarship of an IPE of energy a number of conceptual and empirical themes have emerged which are worth highlighting here.

Interdisciplinarity

The study of energy certainly needs to move beyond the natural sciences and economics, as well as beyond realist IR approaches. Indeed, emerging energy governance challenges are seen directly to pose various problems for market liberal energy governance (Goldthau 2012; Kuzemko 2013; Sovacool 2014; Van de Graaf et al. 2016a; Boersma and Losz, Chapter 10 in this volume). There have been a few attempts recently to bring insights together from a variety of disciplines in order to make more sense of today's complex energy issues and the various challenges that these pose to current politico-economic institutions. It is worth noting here that much of this scholarship has tended to borrow conceptually from IPE (DiMuzio 2014; Kern et al. 2014; Kuzemko 2013; Wilson 2015). A case in point is Van de Graaf et al. 2016b, which explores in detail to what extent IPE scholarship speaks to energy. Indeed, analyses tend to have primarily focused on the task of explaining to energy scholars what IPE offers to them in terms of analytical frameworks for studying the changing world of energy. This *Handbook*, by contrast, seeks to reflect in the opposite direction: what energy scholarship can offer to IPE in conceptual terms.

Detailed examples of this approach are found in attempts to highlight and, indeed, better understand the role of politics and policy within sustainable energy transitions (Kern 2011; Kuzemko et al. 2016; Meadowcroft 2011). The socio-technical transitions (STS) literature is one key approach to understanding technological change which has been applied to explain energy transitions (see Hiteva et al., Chapter 9 in this volume). STS offers insights particularly in relation to understanding how (fossil-fuel) energy regimes are constituted and, indeed, how they can be changed. Although STS recognises that energy systems are both technical and social, it has to date been less focused than IPE on the power relations underpinning energy systems or, indeed, on the politics of energy (Meadowcroft 2011) – again interdisciplinarity has opened the door for further insights. Bringing together STS with IPE has, for example, allowed the question of how institutional contexts influence political decision-making and, ultimately, the nature of energy-system change (Kuzemko et al. 2016); or revealed new avenues for the study of the IPE of energy transitions (Kern and Markard 2016). This 'IPE of energy transitions'

scholarship also emphasises the push and pull between political and economic imperatives, while often also focusing on developing countries (Baker et al. 2014; Power et al. 2016; Baker and Burton, Chapter 7 in this volume).

Moreover, normative approaches to IPE particularly stress the role of energy and climate justice (see Sovacool, Chapter 3, and Lawrence, Chapter 16, in this volume), gender issues (see Fraune, Chapter 5 in this volume) or equity in this context (see Hira, Chapter 18 in this volume). Environmental economics, by contrast, has developed new methods (such as natural resource accounting), which can not only contribute to empirical understanding of energy and resources, but also to understanding the interaction between the environment and socio-economic systems, with a range of policy-useful implications (see Onder, Chapter 15 in this volume). Some of the scholarship in this *Handbook* has sought explicitly to be interdisciplinary, for example by engaging with global public policy (GPP) (see Goldthau and Sitter, Chapter 2 in this volume), justice (see Lawrence, Chapter 16, and Sovacool, Chapter 3, in this volume), gender (see Fraune, Chapter 5 in this volume), geography (see Raszewski, Chapter 19 in this volume), and political ecology (see Sovacool, Chapter 3 in this volume).

Transitions in Energy Systems (see also various in this *Handbook*)

Energy transitions, meanwhile, are starting to happen, particularly if the focus is on the domestic energy strategies of individual states or of the EU (Verbruggen et al. 2015) (see Chen and Lees 2016 on China). While there are ongoing questions about sustainability, as noted above, as well as about the socio-economic distribution of the costs and benefits of energy transitions (see Sovacool, Chapter 3 in this volume), there are also questions more oriented towards ‘everyday IPE’ (see Hobson and Seabrooke 2007). How households and individual consumers can engage proactively with energy transitions, for instance by becoming ‘prosumers’ (Kuzemko et al. 2015), is a critical question because governments, the private sector and the donor community are far from the only actors in energy transitions – as the success of small-scale solar PV projects based on feed-in tariffs demonstrates. Indeed, the emergence of new constellations of energy transitions actors and modes of governance are mutually constituted with emerging technologies and their dissemination patterns (see Britton, Chapter 26 in this volume). With regard to renewable energy systems (RES) this goes beyond solar and into wave, wind, and tidal power, as well as into biofuels, including from waste. We also see the emergence of electricity for transport purposes (including electric cars), ‘smart’ technologies linking energy to ICT, product and process innovations that promote energy efficiency, and the rise of distributed (decentralised) energy systems (Kuzemko et al. 2015). IPE scholarship here is not simply interested in these dynamic areas of change, but in the dynamics of change itself – including actors, interests and institutions (see, for example, Kern 2011; Kern et al. 2014; Kuzemko 2013; Nesadurai, Chapter 13 in this volume), or the structure of global production (see Hughes and Quitzow, Chapter 20 in this volume).

However, it should be noted that despite obvious signs of change emerging in how energy is governed and, indeed, in how energy is being produced and used, some scholars emphasise the strong path dependencies embedded within what might be termed ‘fossil-fuel capitalism’ (Newell and Paterson 2010) or ‘petro-market capitalism’ (DiMuzio 2014) that underpin carbon intensity. Consequently, alongside the emergence of new politi-

cal agendas, such as support systems for renewable energy, vested interests, sunk costs and embedded power relations continue to exert influence over policy-making at local, regional and national levels, not least in the practices and norm-developing functions of global governance institutions (see Wilson, Chapter 4 in this volume). Indeed, at the national level, existing policy frameworks operate in a context of widespread fossil-fuel subsidies, and cross-subsidies, in both developed and developing states. As Lockwood (2014) notes, this is driven by both mercantilist logics of protecting domestic industries, and more welfare-nationalist logics concerning popular access to electricity services. States with a considerable fossil-fuel resource base, furthermore, find it even harder to transform energy systems, given the economic benefits from meeting extensive global demand for fossil fuels (Kuzemko et al. 2016).

Scale/Location and Context (see also various in this *Handbook*)

Scale is understood to be of important analytical and explanatory value. In terms of energy production, there are large question marks hanging over the issue of centralised versus decentralised generation strategies, as well as over the prospects for primary reliance on RES, or indeed, on the proactive behaviour of individual consumers (prosumer). Stirling (2014), for example, argues that distributed, i.e. decentralised, small-scale, energy systems enable a more ‘people’ centred energy system to emerge, with greater opportunities for livelihoods and an overall better distribution of costs and benefits. Indeed, the distribution of social costs remains a key issue, with the externalising of social costs from resource extraction or energy production to local communities a core issue of the IPE of energy in the developing world (see Keating, Chapter 14, and Camba, Chapter 17, in this volume). While the term ‘developing state’ is problematic, the bigger issue may be the tendency for IPE scholarship, energy scholarship and scholarship more generally to evince a bias towards Western contexts, and towards empirical evidence and policy/governance frameworks generated in OECD countries. This *Handbook*, by contrast, strongly emphasises an IPE of energy that overlaps with the political economy of development. Emerging economies have an important place in this context, particularly if they are resource rich and aspiring energy powers (see Raszewski, Chapter 19, and Lira, Chapter 25, in this volume).

Mainstream approaches to the study of resources have oriented themselves around the notion of a ‘resource curse’. Yet IPE scholars have extensively critiqued this concept. They have been able to focus on institutional factors, and on the interlinkages between domestic and global political economy (see Rosser 2006; Rutland 2008; Belyi 2016), demonstrating the linkages between energy and resources and other more fundamental questions such as state capacity, security, and state-societal relations. Furthermore, location matters because the sites of political contestation and change are critical – whether within urban centres (Britton, Chapter 26 in this volume), between local and regional authorities (Kuzemko, Chapter 21 in this volume), or where rural livelihoods are threatened by, for example, hydroelectric dam projects (Bridge et al. 2013; Keating, Chapter 14 in this volume). This is as true at the local level as it is at the global level – the study of hegemony, imperialism, and ‘Great Powers’ must also address the IPE of energy and resource issues, and here scale and location are again critical (see Renfro, Chapter 22 in this volume).

Scale also matters because one of the four core objectives of an IPE of energy, as set out

above, is to engage with the interconnections between international, regional, national, and local levels within energy markets, production and governance (see Skalamera, Chapter 24 in this volume). The same systematic interlinkages between levels are necessary to trace ideas about energy, the transfer of energy policy, and modes of energy governance. Energy geography can contribute here: Gavin Bridge and others have explored the importance of location and boundaries for how energy is produced, used, and its prospects for change – but such approaches need to be embedded in a broader IPE so that we do not end up with the old geopolitics approaches, repackaged to address contemporary issues, reproducing the same limited conceptions of energy.

Finally, while global warming is indeed a global problem, much environmental degradation, including that caused by resource extraction, remains firmly grounded in particular space(s), in the political economy of social coalitions, even if these are themselves globalised, and with regard to urban and rural livelihoods. In effect, there is also an everyday IPE of energy (Hobson and Seabrooke 2007) which must be addressed. There is a localised political economy intertwined with national, regional or global levels, and this is seen not only with energy issues but also with regard to the political economy of resources (see Camba, Chapter 17, and Keating, Chapter 14 in this volume). The role of cities as an emergent actor – and as networked actors through organisations such as the C40 – deserves attention, as do cities as a form of local level for a range of actors (see Britton, Chapter 26 in this volume). These themes re-emerge variously across the book: the contestation of conceptual paradigms; path dependencies and fossil-fuel capitalism versus transitions and change; energy and resources interacting with environment, security and developmental concerns; and how the IPE of energy and resources needs to be understood across a range of scales and locations.

3. NEXUS-THINKING IN THE IPE OF ENERGY

As outlined in Keating et al. 2012 and across a breadth of other recent scholarship one key claim is that energy is increasingly understood in terms of its relationship to climate change (although less in terms of its relationship to the environment). Consequently, new policy priorities and objectives at global and national governance level emerge, especially in terms of transitioning energy sectors away from a reliance on fossil fuels (see Baker and Burton, Hiteva et al., Boersma and Losz, Sharples, and Gritsenko, Chapters 7, 9, 10, 11 and 12 in this volume). But this growing emphasis on climate mitigation contests established, developmental or security-oriented objectives. This creates a trilemma of issues and drives a variation in national, as well as local and regional, responses to a changing energy situation (see Kuzemko et al. 2015), such that an IPE of energy can be seen to open the door to a range of new research agendas (see Falkner, Chapter 6 in this volume). Maintaining the profitability of state-owned or private but state-backed oil companies is not the only issue in this field. The EU, for example, takes a lead in recognising energy as directly linked to climate issues, and seeks to integrate sustainability principles across a range of policy areas (see Strambo and Nilsson, Chapter 8 in this volume). Yet even here we see numerous new problems and issues emerging, as well as debates over the very concept of sustainability (with ‘weak’ and ‘strong’ variants).

However, there is one more aspect of recent energy scholarship that is worth highlight-

ing and describing here because it forms a central organising principle underpinning this book. This aspect relates to the fact that recent scholarship tends to highlight not only that energy is now more often understood in terms of its relationship to climate change, security and development, but also that there are many other interdependencies emerging between energy and other policy areas (see Kuzemko et al. 2016). In other words, the book rests on the idea that it is imperative to go beyond an IPE of ‘just energy’. Energy is understood not as bounded but as part of a dynamic inter-relationship with other issue areas. In fact, for IPE, no issue area can really be dealt with as truly ‘discrete’. This *Handbook* is therefore interested in *nexus-thinking*, that is, in the manifold and multi-faceted intersection between energy and other policy fields or sectors.

These nexuses are in some cases well established, as they constitute traditional policy agendas such as energy and security. Some are brought to prominence by the global policy initiatives underpinning them, for instance, the UNSE4A initiative, which established an energy–environment–development nexus. Others are emerging because of scholarly debates establishing crucial links in areas where policy communities find it hard to see the connections. A case in point here is the energy–sustainability nexus, which has emerged in the context of the energy transition literature. Another example is the inclusion of energy into the United Nations’ Sustainable Development Goals (SDGs) – linking energy to a range of highly specific policy areas including education and health.

Of course, the United Nations’ SDGs also link energy directly to development. Indeed, the nexus between energy and development has been recognised by the donor community in part because of limited success in achieving poverty reduction goals through a framework that ignored energy – that is, through the Millennium Development Goals (MDGs). We live in a world where over a billion people lack electricity, and where indoor air pollution largely caused by bio-mass energy use causes enormous health problems. These issues overlap with poverty at both the national and household level, with issues of rural livelihoods, and with a range of environmental and social problems from deforestation and desertification to primary school education for girls (Kuzemko et al. 2015). Because development has historically been energy intensive, development cannot be discrete from the drive for a low-carbon transition – hence the discourse of sustainability is significant in developing states with diverse domestic political economies. Of course, the energy–development nexus itself begins to cross over into other areas of concern – including questions of security.

Indeed, this *Handbook* identifies further examples of nexus-thinking emerging in the IPE of energy and resources. The assessment of these is a priority task precisely because they can create bridges between researchers and policy agendas (Stone et al. 2001). These include, but are not limited to, the energy–technology nexus (Hiteva et al., Chapter 9 in this volume; Hughes and Quitzow, Chapter 20 in this volume; Brutschin and Jewell, Chapter 23 in this volume), the energy–water nexus (Keating, Chapter 14 in this volume), the energy–food nexus (Hira, Chapter 18 in this volume), or the global–local nexus in energy (Kuzemko, Chapter 21 in this volume), all of which are increasingly identified within some global and national governance organisations and within recent scholarship. Our interest from a scholarly point of view is to establish energy as a highly complex, inter-connected policy area – both in terms of how energy markets and technical regimes are constituted, their implications for other issue areas, and in terms of the extent to which governance institutions are being designed that stretch across these issue areas. This

nexus-thinking, we believe, both adds to and firmly builds upon the four core characteristics of IPE outlined in Keating et al. 2012. This *Handbook* shows that energy nexuses, in their various forms and shapes, are analytically well captured by this ‘IPE toolkit’. Again, the objective here is less to explore what IPE has to offer energy scholars, and more to conceptualise emerging themes of energy scholarship in an academically rigorous and consistent manner, so as to speak to the broader IPE community about the utility of this particular, non-discrete, subject area. With this approach, the present *Handbook* seeks to make a distinct contribution to the lively ongoing academic conversation on the ‘IPE of energy’ to that made by Van de Graaf et al. (2016a).

Interdisciplinarity begins with a *Handbook* of energy and resources – recognising that the themes and issues of these two subject areas overlap in a myriad of different ways, and which other energy specific overviews tend to miss. Here, we can deal with issues of mining, forestry, agriculture and water and discover a range of complex and dynamic interdependencies between issue areas which speak directly to concerns in IPE scholarship. Furthermore, this *Handbook* deals directly with a range of technical and technological issues pertaining to nuclear, fossil fuels and RES. Development, environment and security remain key issues. The following section outlines the individual contributions made to this *Handbook* across four areas: Part I (Overviews, Theories and Concepts); part II (Climate Change, Energy and Low-Carbon Transitions); part III (Energy, Resources and Development); and part IV (Scale: Transnational, National, Local). What follows is a brief summary of the individual chapters IPE scholars have contributed.

4. CONTRIBUTIONS TO THIS *HANDBOOK*

Part I Overviews, Theories and Concepts

Andreas Goldthau and Nick Sitter, in ‘Conceptualizing the energy nexus of global public policy and international political economy’, deal precisely with the intersections between these two different disciplines in energy scholarship. They argue that contemporary dynamics pertaining to global energy trade and security present a challenge for both GPP and IPE. On the one hand, the GPP analysis of energy will need to take account of the IPE debates about geopolitics and power. On the other hand, IPE analyses are called upon to revisit the importance of public goods aspects such as transparency. The chapter identifies five key themes: the commercialization of shale oil and gas; its consequence for state or international regulation and intervention in oil and gas markets; debates on whether the increased focus on security of supply in the USA, the EU and China (and security of demand in Russia) merits new national policies and international regimes; the kind of global rules that might be viable given the new constellations of power in the world of energy; and what kind of actors shape the future of the energy world.

Benjamin K. Sovacool, in ‘Advancing the international political economy of climate change adaptation: political ecology, political economy and social justice’, draws on these three diverse literatures in order to advance a specific IPE of climate change adaptation. At the core of the argument is the usefulness of 4 ‘Es’ – enclosure, exclusion, encroachment and entrenchment – as concepts which enable an understanding of the ways in which adaptation projects can produce unintended, averse, or inequitable results. In exploring

these themes, the chapter touches upon numerous themes in IPE scholarship, including critical development studies, neoliberalism and the corporatisation of public assets and goods, and normative approaches to IPE such as global justice and Marxism.

Jeffrey D. Wilson, in 'The resource nationalist challenge to global energy governance', observes that energy is one of the least institutionalised, rules-based and cooperative domains of the contemporary IPE. He argues that while there does not necessarily exist a 'governance gap', it is a plethora of weak and fragmented institutional arrangements that prevails. The cause, as the chapter shows, lies in resource nationalism, that is state control over energy sectors through ownership, trade and subsidy policies. The consequence is an energy system that lacks representative and effective governance institutions capable of meeting emerging energy challenges. While resource nationalism persists in a range of important energy players – particularly Russia, China, Indonesia and the Gulf States – Wilson argues that it is likely that energy will remain a fragmented and under-developed domain of the global economy in the future.

Cornelia Fraune, in 'A gendered perspective on energy transformation processes', uses a feminist IPE approach to unpack the intertwining of gender relations and energy transformations. Fraune notes that energy systems are not purely a matter of technology levels and resource endowments; they also express the nexus of mode of production and living in a society. Energy transformation processes, consequently, affect the social distribution of resources and power within a society. The analysis of renewable energy production, private energy consumption, and sustainable energy policy-making therefore reveal the interdependencies between gender regimes and energy transformation processes.

Robert Falkner, in 'Climate change, international political economy and global energy policy', provides an overview of how the threat of global climate change and the need to de-carbonize the global economy have created new energy research agendas in these two different disciplinary areas. Four areas of environment-oriented energy research are reviewed: the emerging energy trilemma of security, poverty and climate change; policy-making for decarbonisation in the context of global capitalism; financing of low-carbon energy transitions; and dealing with the global architecture of energy governance. The questions and issues raised demonstrate the vitality of existing research and provide some pointers to important new themes arising. Falkner is able to bring the climate change and energy scholarship together while extracting key lessons about contemporary global political economy.

Part II Climate Change, Energy and Low-carbon Transitions

Lucy Baker and Jesse Burton, in 'The politics of procurement and the low-carbon transition in South Africa', examine recent developments in the South African electricity sector. The chapter outlines how electricity policy is embedded within long-standing political and economic forces, and subject to diverse and often conflicting interests. An analytical framework is developed that links the literature on STS with that of the political economy of electricity. The South African case highlights that energy transitions are not merely about technological choices, but are embedded in institutional arrangements that may have unintended consequences or may be born of broader political struggles that go beyond climate change considerations, and indeed may limit the potential for transformation of the sector. This point is highlighted by looking at the impact of private power

producers, which since 2011 have invested in renewable energy projects that make a small but significant contribution to supply and provide competitive alternatives to generation from the state-owned utility giant, Eskom.

Claudia Strambo and Måns Nilsson, in ‘The Energy Union: a coherent policy package?’, look at the 2015 EU project of an ‘Energy Union’, designed to reduce energy policy fragmentation and enhance Europe’s own energy transition. The authors analyse the coherence of the Energy Union as a policy package, and whether its distinct components are being pursued in a coordinated manner. A policy-analytical framework in which the policy components are juxtaposed in a screening matrix is used. A novel typology for understanding interactions between policy components and the coherence of the 2030 Agenda is used to assess the Energy Union, with policy interactions ranging on a scale from cancelling to indivisible. The authors conclude that interactions are often complex, and vary according to the time frame. Two key hotspots are identified: the relationships between energy security and energy efficiency, and between energy security and decarbonisation.

Ralitsa Hiteva, Tim Foxon and Katherine Lovell, in ‘The political economy of low carbon infrastructure in the UK’, propose a broader and more inclusive definition of the concept of low-carbon infrastructure. They emphasise the need for a systemic approach, integrating different elements, interdependencies, and cumulative and networked effects of infrastructure. Changing infrastructure decision-making processes and governance arrangements may then enable greater consistency in aligning with the UK’s low-carbon commitments under the Paris Agreement and the Climate Change Act. The traditional cost–benefit analysis logic of infrastructure decisions would be enhanced with attention to social, environmental and economic values: social justice; equality; and participation. Using a business model framework (focused on creating and capturing value) the authors demonstrate how low-carbon infrastructure is linked to core governance challenges through two case studies of transnational municipal networks, and of local supply networks.

Tim Boersma and Akos Losz, in ‘The new international political economy of natural gas’, offer a comprehensive assessment of the rapidly changing IPE of natural gas. With the shale revolution putting an end to scarcity, and with Liquefied Natural Gas linking regional gas markets and pricing patterns being increasingly backed by market fundamentals, established players such as Russia are increasingly under pressure. At the same time, the authors argue that the combination of the climate regime, national politics in key markets such as China, and infrastructure bottlenecks in Europe render the role of gas in the future energy systems deeply uncertain. The chapter explores what this paradigm shift means for markets, states, and the power dynamics between a range of different actors in the changing natural gas landscape.

Jack D. Sharples, in ‘Europe’s largest natural gas producer in an era of climate change: Gazprom’, reflects on the states and markets debates in IPE through analysis of the relationship between national energy policies and the activities of energy companies, in the context of climate change concerns. Gazprom’s investment in gas-fired power generation and gas-fuelled transportation is used to illustrate the extent to which national and supranational governance shapes the strategies of commercial actors in the energy sector. Russia’s position as an energy-exporting country is demonstrated to influence the policy orientation of the Russian government, rendering Gazprom as distinct from import-

dependent European energy companies. Gazprom, consequently, emerges as a powerful lobbyist for gas-fired power generation and gas-powered transportation, with substantial consequences for decarbonisation efforts in both Russia and the EU.

Daria Gritsenko, in 'Energy development in the Arctic: resource colonialism revisited', addresses the issue of easier access to the Arctic resource riches that result from accelerated climate change. Because of this, many countries, including non-Arctic states, are now considering the Arctic as a viable source of future energy and mineral supplies. Current conversations on Arctic energy futures are explored through the lens of resource colonialism. Focusing on the intertwined politics and economics of Arctic energy the author demonstrates that ongoing Arctic developments are being shaped by expectations, decisions and events taking place outside the Arctic region. The contradictory relationship between energy and environment that accompanies the persistent interest in Arctic resource wealth is held to mark a shift in the IPE of energy from 'old' to 'new' carbon governance.

Part III Energy, Resources and Development

Helen E.S. Nesadurai, in 'Transnational private regulation and the global governance of palm oil sustainability: from Roundtable on Sustainable Palm Oil certification to the Palm Oil Innovation Group/No-Deforestation standard', examines a multi-billion dollar global industry controversial for its role in deforestation, global warming, and conflicts over land and labour. The author demonstrates how the failure of the producer governments (Malaysia and Indonesia) to address these adverse impacts led non-governmental organisations (NGOs) and consumer goods manufacturers to establish private standards to govern the behaviour of palm oil firms. Analysis shows how the market can induce palm oil plantation corporations to adopt environmental and social standards, whereas previously their unsustainable production practices can be seen as arising from their patron-client relations with state actors. These findings enable the author to reflect on broader debates in global governance concerning the conditions under which new forms of environmental and social regulation become embedded in local contexts.

Michael F. Keating, in 'International political economy and the global governance of hydroelectric dams', addresses the limitations of the attempt to develop new norms that can underpin global governance of hydroelectric dams in the 1990s. While global governance responses to the politics of hydroelectricity are evident in a range of different ways in this period, these tended to dissipate. Consequently a model of corporate self-regulation has emerged as the main form of governance, leaving a set of unaddressed social, economic and environmental costs to hydropower projects. Furthermore, the chapter traces the weakening capacity of the local-global civil society groups which generated the global governance impetus in the first place. A range of IPE themes relating to actors, institutions, governance, environment and policy processes can be interrogated through this overlapping water/energy policy sector. The World Commission on Dams, the United Nations Development Programme (UNDP) and the Hydropower Sustainability Assessment Protocol (HSAP) are addressed along with some case material from Uganda's Bujagali Dam project.

Stefanie Onder, in 'Managing the use of natural resources: how ecosystem accounts helped in the Philippines', provides a detailed analysis of natural capital accounts (NCA),

and how they can provide the data and analysis needed to manage the often competing claims on natural resources effectively, as well as helping to monitor and assess possible development options. Evidence-based decision-making is held to allow a balanced response to imperatives for both economic growth and sustainable resource management. NCA is shown to provide consistent and comparable data on water, energy and forests as well as ecosystems, revealing the interactions between the economy and the environment. The Philippines case study is linked to The Wealth Accounting and the Valuation of Ecosystem Services (WAVES) global partnership, which has enabled the Philippines to emerge in recent years as a global leader in the field of ecosystem accounting. Details are provided on two pilot sites – Southern Palawan and the Laguna de Bay basin, where ecosystem accounts have helped identify policy options that improved the management of these resources, and contributed to the building of broad-based support for the further use of natural capital accounting in decision-making.

Andrew Lawrence, in ‘How can climate justice and energy justice be reconciled?’, argues that the low-carbon transition increases the number of potential pathways in which the goals of *energy* justice can be placed at the centre of *climate* justice efforts. This follows from the capacity of renewable energy to promote localised and participatory inward development, as well as to remove oil as a potential source of international conflict. Policies promoting renewable energy realise gains in three different ways. Reducing greenhouse gas emissions while increasing energy access maximises both *climate* justice and *energy* justice, and with appropriate governance over emerging energy systems, can also promote participatory development. Local influence over policy design and implementation will be reflected in both employment outcomes and broader human rights concerns. Insights from case studies of grid decentralisation and political decentralisation enable the author to illustrate these three claims.

Alvin A. Camba, in ‘The politics of resistance in the neoliberal mining regime’, addresses the ways in which resource rich states have reconfigured their national development strategies since the 1980s in response to rising global economic pressures. The social movement literature, focusing on civil society resistance to mining companies (large-scale mineral extraction or LSM) and the literature on artisanal small-scale mining (ASM), which seeks to promote a developmental model outside the corporate-led economy is here brought together with regard to the politics of resistance to the neoliberal mining regime. Using a case study of mining in the Philippines, this regime is shown to advance not only resource extraction, but also market norms and new modes of governance. Furthermore, while neoliberal policies (such as liberalisation and market competition) sought to attract large-scale mining investments, they also led to expanding ASM operations. Yet studies of the politics of resistance focus primarily on the social adjustment and environmental costs of the former, rather than those of the latter.

Anil Hira, in ‘Food for fuels? Examining the issue of trade-offs between energy and food’, analyses the energy–food nexus. Built around the issue of prices, this nexus is loosely framed through the application of the concept of ‘trilemma’, specifically between issues of efficiency, security and equity. Analysis focuses on one of the most discussed potential causes of food price rises, namely the prospect of a trade-off between energy and food in the production and use of biofuels. This is particularly resonant when food crops, such as corn, can alternatively be converted into relatively environmentally benign liquid fuels for transportation. The author demonstrates through a review of the empirical

and policy literature that the relationship between energy and food is highly complicated and contingent, such that solutions to energy–food nexus trilemmas require multi-faceted efforts.

Slawomir Raszewski, in ‘Emerging economies and energy: the case of Turkey’, looks at the case of Turkey and to what extent its energy policy ambitions are squeezed between a growing domestic economy, international energy market developments and geopolitical imperatives stemming from its geographical location. The author particularly highlights the political risk factor coming with the status as an emerging market. This chapter examines national energy policy from an emerging economies perspective, focusing on the question of risk. This includes socio-economic, regulatory and political dimensions, and enables domestic, international and geographical dimensions to be captured. The Turkish case study in particular highlights the impact of geographical factors on the political economy of emerging economy energy trade issues. Conflicting policy choices between the domestic and international levels are shown to be the main stumbling block emerging from a risk-focused analysis of the IPE of emerging markets.

Part IV Scale: Transnational, National, Local

Llewelyn Hughes and Rainer Quitzow, in ‘Low-carbon technologies, national innovation systems, and global production networks: the state of play’, turn our attention to global production networks (GPNs) and the role they play in determining how policies implemented by national governments interact in interdependent economic settings. The authors show that it is the specificity of the sector – such as solar photovoltaic and wind power – which explains the patterns of production for low-carbon technologies, and to what extent public policies shape the patterns of global technology diffusion. GPNs in low-carbon technologies are shown to touch on a range of IPE concerns, particularly in regard to how national policies reflect profound economic and technological interdependences. This is particularly important given that low-carbon technology markets are highly dependent on government intervention.

Caroline Kuzemko, in ‘An international political economy of climate change benchmarking: energy standard setting, responses and challenges’, examines climate change benchmarking. With reference to constructivist IPE, which interprets benchmarks as constructed, open to contestation and change, and deeply political, the author overviews four different categories of climate change benchmarking, and how each seeks to set new standards that are of specific relevance to the energy sector. This is one example of the ways in which climate change and energy policy areas are becoming intertwined within governance practices. The chapter also engages with the response to benchmarking from non-state and sub-state actor groups – thereby revealing some new themes within the politics of climate change benchmarking.

Wesley B. Renfro, in ‘Energy trends, political economy, and international order: the United States and the People’s Republic’, addresses imperialism in the contemporary global political economy, by studying US oil politics with specific regard to China. Broader historical developments are taken on the global scale, as the relationship between energy and foreign affairs is analysed within the context of Sino-American politics. The author argues that analyses of power in mainstream IR have not paid sufficient attention to the crucial role of energy in determining the relative position of actors in the

international system. Surveying recent trends, increased energy production thanks to shale gas is held to convey significant advantages for the United States, while comparative energy scarcity is likely to be a burden for the People's Republic.

Elina Brutschin and Jessica Jewell, in 'International political economy of nuclear energy', highlight the importance of the three main technologies which make up the nuclear supply chain: uranium production and trade; the fuel cycle; and nuclear power plants. The authors show that each set of technologies creates a distinct form of international (inter)dependence which is key for understanding the evolution of the nuclear industry and also its future. The tension between the need to meet growing electricity demand without fossil fuels and the capacity requirements for nuclear energy programmes is demonstrated to be a defining feature of the IPE of nuclear energy. Nuclear energy's ability to provide for energy security and industrial modernisation must be weighed against uneven capacities, and in this context international cooperation and competition are revealed to shape how states deploy, expand, or phase out their nuclear power programmes profoundly.

Morena Skalamera, in 'The domestic factor in the international political economy of Eurasian gas trade', places emphasis on domestic political economy in explaining Eurasian gas relations. Focusing on Russia and China, the author highlights the importance of changing domestic developments, such as threat perceptions or economic imperatives which systematically influence energy foreign policy-making, rather than focusing on geopolitical considerations. The changing gas relationship between Russia and the EU is linked to Russia's move towards the Chinese market, and a distinctive transformation in the policy discourse at the domestic level in all of the three blocks can be identified. Both global ideational change and dynamic interlinkages between different actors across various levels are demonstrated to impact upon domestic energy policy-making processes, and so on the political economy of the Eurasian gas trade.

Flavio Lira, in 'Between global aspirations and domestic imperatives: the case of Brazil', points to a lack of consistency in the domestic energy policy regime, which prevents one of the largest emerging economies from fully reaping the benefits of a sizeable energy economy, considerable resource endowments and a relative absence of geopolitical disturbances. Brazil, a major bio-fuel and emerging oil producer, with large renewable investments in both transport and electricity generation, is held to epitomise the rapidly changing global energy landscape. As a leading country of the 'Global South', Brazil also finds itself at the forefront of power shifts in the broader IPE. However, non-linear domestic-level governance dynamics between the state and the market prevent Brazil from utilising the full potential of its distinct domestic political economy to further its aspirations for domestic energy transitions and global influence.

Jessica Britton, in 'Localising energy: heat networks and municipal governance', engages with the transition to a low-carbon energy system, and the social, political, economic and technological changes this will likely require. To achieve these transitions, the roles of different actors and organisations, including at various levels of the state, are called into question. The author explores the overlooked role of cities in promoting energy transitions, through analysis of the development of heat networks. Based on UK research, several local authorities are shown to challenge their traditional 'enabling' role in the energy system, instead taking a more proactive role in the ownership and delivery of heat networks. Consequently, energy transitions can lead to the emergence of new con-

figurations of state-market inter-relations, with sub-national public sector actors using the development of local-scale energy infrastructure to deliver multiple priorities. UK devolution policies, therefore, may have empowered local governments, enabling them to re-evaluate their role in the energy sector. The IPE of energy transitions, therefore, can be linked with broader governance trends towards decentralisation.

5. MOVING FORWARD

The *Handbook of the International Political Economy of Energy and Natural Resources* sets out, in a short chapter format, what the research landscape currently looks like. The collective works present a picture of a changing, highly complex and contested world of energy and resources. The project seeks to go beyond applying IPE conceptual approaches to better understand and analyse energy and resources, reflecting instead on what energy and resource scholarship can tell IPE in conceptual terms. It is hoped, however, that this *Handbook* can be built upon, that it will represent an opportunity which IPE scholars can seize to further their interdisciplinary engagement, to further their understanding of actors, institutions and interests, to strengthen their conceptualisations of the complex global political economy across multiple levels, and to pursue a range of normative concerns in practical, empirical contexts that will directly speak to policy-making. Policy-making, that is, not only in the field of energy and resources, but in a range of other interlinked issue areas.

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