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## **Cooperating in the Energy Security Regime Complex**

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## **Abstract**

Existing work on energy security tends to overemphasise the prospect of competition and conflict over resources while under-exploring the promise of cooperation among global and regional economies. Viewing energy security through the spectre of armed conflict traps policy planners in a zero-sum analysis, which strongly suggests that the energy security of one country can only be achieved at the expense of another. Yet such a conclusion is fundamentally flawed, since it ignores the increasingly complex interdependence in the energy and product trade chain among countries, globally and regionally.

This paper provides an analytical framework for understanding and explaining energy security and highlights some building blocks for crafting energy cooperation in East Asia. There is no integrated regime to address issues related to energy security. Instead, there is a patchwork of loosely coupled rules, regulations and institutions, overlapping and sometimes competing, which amount to a regime complex.

Since efforts to build a comprehensive energy security regime – one governed by a single authority – are unlikely to be politically feasible, it is most likely that such a regime complex will persist. Framing energy security as a regime complex raises important policy implications that need to be addressed. This paper asserts that an energy security regime complex may have advantages over any integrated regime, most notably in terms of adaptability, flexibility and voice. These features are particularly pertinent in an environment of high vulnerability and uncertainty.

## Biography

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## Abbreviations

ACD	Asia Cooperation Dialogue
ACE	ASEAN Centre for Energy
ACMECS	Ayeyawady-Chao Phraya-Mekong Economic Cooperation Strategy
APEC	Asia-Pacific Economic Cooperation
APEREC	Asia Pacific Energy Research Centre
APNet	Asia-Pacific Network for Energy Technology
APP-CDC	Asia-Pacific Partnership on Clean Development and Climate
ASCOPE	ASEAN Council on Petroleum
BFA	Boao Forum for Asia
BIMP-EAGA	Brunei Darussalam-Indonesia-Malaysia-Philippines East ASEAN Growth Area
BIMSTEC	Bay of Bengal Initiative for Multi-Sectoral Technical and Economic Cooperation
BRICS	Brazil, Russia, India, China and South Africa
BSEC	Organization of the Black Sea Economic Cooperation
CAREC	Central Asia Regional Economic Cooperation
CD4CDM	Capacity Development for the Clean Development Mechanism
CLASP	Collaborative Labeling and Appliance Standards Program
ECNEA	Intergovernmental Collaborative Mechanism on Energy Cooperation in North-east Asia
ECO	Economic Cooperation Organization
ECO-Asia	Environmental Cooperation – Asia
ECT	Energy Charter Treaty
EESD	Efficient Energy for Sustainable Development Partnership
ENERGIA	International Network on Gender and Sustainable Energy
ESI	Energy Security Initiative
EUEI	European Union Energy Initiative for Poverty Eradication and Sustainable Development
EurAsEC	Eurasian Economic Community
GATS	General Agreement on Trade in Services
GMS	Greater Mekong Subregion
GNESD	Global Network on Energy for Sustainable Development
GTI	Greater Tumen Initiative
GVEP	Global Village Energy Partnership
IEA	International Energy Agency
IEF	International Energy Forum
IEP	International Energy Programme
CERM	Coordinated Emergency Response Measures
INFORSE	International Network for Sustainable Energy
IO	International organisation
IPHE	International Partnership for Hydrogen and Fuel Cells in the Economy
OECD	Organisation for Economic Co-operation and Development
OPEC	Organization of the Petroleum Exporting Countries
PCFV	Partnership for Clean Fuel and Vehicles
PEG (Pacific)	Pacific Energy and Gender Network
PEG	Partnership for Equitable Growth
PIEPSAP	Pacific Islands Energy Policy and Strategic Action Planning
PIESD	Pacific Islands Energy for Sustainable Development

PIFS	Pacific Islands Forum Secretariat
RDI	Renewable Development Initiative
REEEP	Renewable Energy and Energy Efficiency Partnership
SAARC	South Asian Association for Regional Cooperation
SARI/E	South Asia Regional Initiative for Energy Cooperation and Development
SASEC	South Asia Subregional Economic Cooperation
SCO	Shanghai Cooperation Organization
SECSCA	Subregional Economic Cooperation in South and Central Asia
SEFI	Sustainable Energy Finance Initiative
SOPAC	South Pacific Applied Geoscience Commission
SPECA	UN Special Programme for the Economies of Central Asia
UN ESCAP	UN Economic and Social Commission for Asia and the Pacific
WTO	World Trade Organization

Existing work on energy security tends to overemphasise the prospect of geopolitical competition and conflict over access to resources while under-exploring the promise of cooperation among global and regional economies.<sup>1</sup>

Viewing energy security through the spectre of competition and conflict effectively traps policy planners in a zero-sum analysis that excludes the possibility of cooperation: the energy security of one country can only be achieved at the expense of another. Yet such an approach is fundamentally flawed, since it ignores the increasingly complex interdependence in the energy and product trade chain among countries, globally and regionally. The preoccupation with energy competition obscures the real issues policymakers need to consider in crafting their national energy policies: the central role of global markets in the demand and supply of energy, particularly oil, as well as the importance of the underlying rules and principles, including institutions, that govern those markets.

Since 1980, global consumption of primary energy has doubled.<sup>2</sup> Much of the increase has come from Asia and the Pacific. This is due to rapid economic growth, massive investments in infrastructure and a booming construction industry, rising populations and a decline in the use of non-commercial energy, such as biomass and waste. By 2035, if current trends persist, there will be another 50 per cent increase in global energy consumption.<sup>3</sup> Non-members of the OECD account for over 90 per cent of the projected increase in global energy demand, reflecting faster growth rates in their pursuit of modernisation. Energy demand in East Asia will grow faster than in any other region.<sup>4</sup> Governments are therefore under strong pressure to deliver effective fixes in addressing a dual challenge: providing adequate, secure and sustained supplies of energy at affordable prices, on the one hand, and mitigating environmental damage as a result of energy consumption, on the other.

For policymakers, this creates a situation that can best be described as a security dilemma.<sup>5</sup> They are confronted with a two-level strategic predicament: first, the dilemma of interpreting the motives, intentions and capabilities of others; second, the dilemma of response, which essentially boils down to the question of whether cooperation or competition should be the preferred policy choice in addressing issues related to energy security. Underlying this strategic predicament is a situation of fundamental uncertainty. Cooperation provides a policy alternative to address and overcome conflict within a defined framework. In effect, cooperation reduces uncertainty. At the same time, complex interdependence significantly increases the costs of non-cooperation: pursuing a policy of complete energy independence becomes untenable within a global energy market.

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<sup>1</sup> See, for example, Pak Lee, 'China's Quest for Oil Security: Oil (Wars) in the Pipeline?', *The Pacific Review* 18, no. 2 (2005): 265–301; Brahma Chellaney, *Water: Asia's New Battleground* (Washington, DC: Georgetown University Press, 2011).

<sup>2</sup> See UN ESCAP, *Energy Security and Sustainable Development in Asia and the Pacific* (Bangkok: United Nations, 2008).

<sup>3</sup> See IEA, *World Energy Outlook 2010* (Paris: OECD, 2010).

<sup>4</sup> For example, China's energy use is expected to rise by 75 per cent between 2008 and 2035.

<sup>5</sup> On the security dilemma, see John H. Herz, *Political Realism and Political Idealism: A Study in Theories and Realities* (Chicago, IL: Chicago University Press, 1951); Ken Booth and Nicholas J. Wheeler, *The Security Dilemma: Fear, Cooperation and Trust in World Politics* (New York: Palgrave Macmillan, 2008).

This paper offers an analytical framework for understanding and crafting cooperation in the energy security complex. It focuses particularly on East Asia,<sup>6</sup> where economies are all highly dependent on uninterrupted supply of energy resources, but the rules and mechanisms for governing energy security are sub-optimal.<sup>7</sup> The social and economic costs of energy insecurity are considerable. For example, most of the energy resources of the world – a quarter of its oil reserves, more than half of its natural gas and coal reserves and almost two-thirds of its uranium reserves – are in the Asia-Pacific, but they are unevenly distributed.<sup>8</sup> While energy trading is necessary for making these resources available across the region, regional cooperative mechanisms are still underdeveloped. Furthermore, limited transnational collaboration (e.g., in the stockpiling of strategic oil reserves) is the only initiative that makes regional economies less vulnerable to the global oil market, whose volatility has the potential to disrupt vital supplies.

Energy governance is characterised by a fractured landscape. The International Energy Agency (IEA) is the primary source of the world's energy statistics, but it is unable to speak for the global energy community, since major oil importers such as China and India are not represented. Nor does it have the authority to develop and enforce a global system of mutually agreed energy rules. Concerns about energy insecurity have led to renewed discussions about the advantages of nuclear power. Yet the virtues of energy security seem to stand in sharp contrast to the vices of nuclear non-proliferation, which raises issues that need to be addressed across the two regimes. In East Asia, the problem is compounded by the fact that most governments 'have considered energy policies in isolation from policies for environmental protection and poverty'.<sup>9</sup> The strong nexus among the energy security, nuclear non-proliferation and climate change regimes therefore needs to be considered in crafting energy security cooperation.

Section 1 investigates global power shifts that have both global and regional impacts on the nature of collective action problem-solving. Section 2 looks into the demand and supply sides of energy security cooperation and introduces the key properties of the regime complex for energy security. Section 3 discusses the consequences of regime complexity for energy security cooperation. The conclusions in Section 4 highlight building blocks for energy security cooperation in East Asia and propose policy recommendations on how to cooperate under the condition of regime complexity.

## 1. Western Liberal Order in Transition

The question of how to manage global collective action problems in the 21st century needs to be addressed in the context of the wider debate about the future of the Western liberal order.<sup>10</sup> This post-World War II US-led order is becoming increasingly challenged by the gap between the hugely increased geographical, functional and normative ambitions of

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<sup>6</sup> East Asia shall be understood here as the geographical area covering the 10 ASEAN countries, China, Japan, the Korean Peninsula and Taiwan.

<sup>7</sup> See Andreas Goldthau and Jan Martin Witte, ed., *Global Energy Governance: The New Rules of the Game* (Washington, DC: Brookings Institution Press, 2010).

<sup>8</sup> See UN ESCAP, *Energy Security and Sustainable Development in Asia and the Pacific*.

<sup>9</sup> *Ibid.*, xviii.

<sup>10</sup> Open markets and societies, the rule of law, international institutions, cooperative security, democratic community, progressive change and collective problem-solving are key features of the Western liberal order. See for example G. John Ikenberry, 'Liberal Internationalism 3.0: America and the Dilemmas of Liberal World Order', *Perspectives on Politics* 7, no. 1 (2009): 71–87.

international society and the lack of means to deliver them. This paper starts from three observations: first, the Western liberal order is in a protracted process of transition; second, there is currently no hegemon that would be able (or willing) to replace the United States and push for a redesign of the global governance architecture from scratch;<sup>11</sup> and third, in the absence of a complete overhaul of global institutions, international collective action is bound to remain piecemeal. Multilateral pluralism is in high demand. However, many of the collective action problems we are facing today – energy security, climate change, nuclear non-proliferation – are global in nature, which creates several challenges. While there seems to be a growing demand for effective global cooperation, we have neither universally applicable concepts to analyse collective action nor a common language to facilitate the solving of global collective action problems. In fact, the same collective action problem may be perceived and addressed quite differently in different parts of the world. Hence, alternative forms of multilateralism need to be studied from individual regional perspectives.<sup>12</sup> Today's changing global order confronts us with three central questions:

1. Are there alternative visions of how to address collective action problems that can be identified across regions?
2. What forms of cooperation do we need to address collective action problems effectively?
3. Where does the authority come from to enforce and to create wider acceptance for specific collective action outcomes?

The first question looks at the *principles* of global order, which take the form of the core bargain underlying collective action problem-solving. With the Western liberal order being contested, we need to explore the extent to which the grand bargain or the rules of the game are changing. The second question relates to the *problems* of global governance, examining the challenge of properly framing collective action problems through governance mechanisms – multilateralism, bilateralism, unilateralism, networks or more traditional concert-style diplomacy. Institutional choice needs to come under scrutiny here. The third question examines the *processes* of global governance. It traces the sources of authority in collective action problem-solving by looking into how the competing demands of power, justice and compliance are reconciled.<sup>13</sup>

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<sup>11</sup> On this point, see the excellent review essay by Christopher Layne, 'The Waning of U.S. Hegemony – Myth or Reality?', *International Security* 34, no. 1 (2009): 147–72.

<sup>12</sup> How can we define a region? The ambiguity of the term makes it a contested concept with questionable explanatory leverage. In essence, regions are social constructions that are open to political contestation. The boundaries of a security region may therefore differ entirely from those of an economically integrated regional entity. Here, we understand region very broadly as a limited set of states and non-state actors connected by geographical proximity and a degree of mutual interdependence. This definition is adapted from Joseph S. Nye, Jr., comp., *International Regionalism* (Boston: Little, Brown and Company, 1968), vii. See also Peter J. Katzenstein, *A World of Regions: Asia and Europe in the American Imperium* (Ithaca: Cornell University Press, 2005).

<sup>13</sup> Authority implies a relationship in which rule-takers voluntarily comply with the laws and commands exercised by the rule-makers. On authority as a central concept of social science and the diverse motives of compliance, see Max Weber, *Economy and Society: An Outline of Interpretive Sociology*, Vol. 1, ed. Guenther Roth and Claus Wittich (Berkeley: University of California Press, 1978), Part One, Chapter III. See also David A. Lake, 'Escape from the State of Nature: Authority and Hierarchy in World Politics', *International Security* 32, no. 1 (2007): 47–79; David A. Lake, 'Relational Authority and Legitimacy in International Relations',

After World War II, at the peak of its hegemonic power, the United States formed an unprecedented framework of international institutions that facilitated sustained engagement in global affairs and helped to cast the shadow of US hegemony well into the post-Cold War future. The institutions and practices of cooperative security constituted part and parcel of a distributive peace, reflecting the new balance of power and the distribution of territory. At the same time, those institutions established rules and regulations that helped to maintain the core of the Western liberal order.<sup>14</sup> In this context, the concept of binding institutions needs to come under scrutiny.<sup>15</sup> By complying with institutional norms and procedures, the hegemon – motivated by its interest to prevent the emergence of potential rivals or counter-coalitions – enters into a bargain with the weaker states; in return, weaker states benefit from hegemonic self-restraint because IOs offer platforms to articulate and pursue their interests within a relatively stable framework. This constitutional bargain reduces the returns to power, thereby preventing disproportionate gains and limiting potential losses to the cooperating units. Hence, the constitutional bargain underlies a political order that has three essential features: first, there is a shared agreement on the basic rules and principles of the order; second, the exercise of power is constrained by and regulated through established rules and institutions; and third, those rules and institutions cannot be easily changed without putting the constitutional bargain at stake. In effect, a constitutional order helps to freeze the distribution of power at the time of the institution's establishment. However, it also extends the preponderance of a state well into the future when its hegemonic power may already be in decline.

However, as the global order is changing, the constitutional bargain has become contested and is in the process of being renegotiated.<sup>16</sup> This process is epitomised in the proliferation of alternative mechanisms of cooperation, which serve as institutional fora for renegotiating the post-World War II settlement. The post-Cold War era has seen the growing importance of informal institutions – G-x groups, networks, coalitions of the willing, contact groups, core groups, groups of friends – that act in and around IOs.<sup>17</sup> While formal IOs certainly still have

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*American Behavioral Scientist* 53, no. 3 (2009): 331–53. For a criticism of global governance scholarship as ‘too statist’, see David A. Lake, ‘Rightful Rules: Authority, Order, and the Foundations of Global Governance’, *International Studies Quarterly* 54, no. 3 (2010): 587–613; also Jochen Prantl, ‘Informal Groups of States and the UN Security Council’, *International Organization* 59, no. 3 (2005): 559–92.

<sup>14</sup> Distributive peace refers to the ‘new division of the spoils’ emerging from a settlement (e.g., the realignment of territorial borders or the creation, adjustment or dissolution of alliances). Regulative peace, on the other hand, refers to the wider means available to enforce, modify and legitimise a settlement. See Ian Clark, *The Post-Cold War Order: The Spoils of Peace* (Oxford: Oxford University Press, 2001).

<sup>15</sup> See G. John Ikenberry, ‘Constitutional Politics in International Relations’, *European Journal of International Relations*, 4, no. 2 (1998): 147–77; G. John Ikenberry, ‘Institutions, Strategic Restraint, and the Persistence of American Postwar Order’, *International Security* 23, no. 3 (1998–1999): 43–78; G. John Ikenberry, *After Victory: Institutions, Strategic Restraint and the Rebuilding of Order after Major Wars* (Princeton, NJ: Princeton University Press, 2000).

<sup>16</sup> The bargain is not limited to a common understanding of running a set of institutions. Hedley Bull, for example, refers to certain guidelines or signposts that define behavioural patterns underlying collective action, which may in fact serve as overarching operating procedures or rules of the game. Those rules precede international law and international institutions; they help to foster some degree of expectation of compliance with certain principles of conduct, however tentative those may be. The rules of the game are strengthened if they become embodied in formal international organisations. See Hedley Bull, ‘Order vs. Justice in International Society’, *Political Studies* 19, no. 3 (1971): 269–83.

<sup>17</sup> See Jochen Prantl, *The UN Security Council and Informal Groups of States: Complementing or Competing for Governance?* (Oxford: Oxford University Press, 2006); Teresa Whitfield, *Friends Indeed? The United Nations, Groups of Friends, and the Resolution of Conflict* (Washington, DC: United States Institute of Peace Press,

a role to play in providing legitimacy,<sup>18</sup> we should not overlook two important points: first, the underlying problems originating in the huge asymmetries of power in the international system; and second, the substantial challenges facing IOs in acting as effective problem-solvers and adapting to system and systemic change, which has undermined the post-World War II constitutional settlement between the United States and multilateral institutions.

In conclusion, the contestation of the Western liberal order added to the institutional complexity of the architecture of frameworks that are available for addressing collective action problems such as energy security, climate change and nuclear non-proliferation. The governance of those problems, globally and regionally, is increasingly defined by a multitude of parallel, partially overlapping and sometimes competing agreements. Tables 1 and 2 provide a schematic overview of the regime complex for energy security in East Asia. The consequences for states and the processes of the energy security regime will be addressed in Sections 2 and 3.

*Table 1: Energy initiatives in East and North-east Asia.*

<b>Initiative</b>	<b>Acronym</b>	<b>Type</b>	<b>Energy subsector</b>
ASEAN + 3 through ACE	ASEAN + 3	Intergovernmental	
Asia-Pacific Economic Cooperation	APEC	Intergovernmental	
Asia-Pacific Partnership on Clean Development and Climate	APP-CDC	Partnership	
Central Asia Regional Economic Cooperation	CAREC	Programme	Electric power, energy efficiency
Energy Charter Treaty	ECT	Intergovernmental	Electric power, energy efficiency
Intergovernmental Collaborative Mechanism on Energy Cooperation in North-East Asia	ECNEA	Intergovernmental	
Eurasian Economic Cooperation	EurAsEC	Intergovernmental	Electric power, fossil fuels
Greater Mekong Subregion Programme	GMS Programme	Programme	
Greater Tumen Initiative	GTI	Programme	Electric power
Mekong Programme	Mekong Programme	Intergovernmental	Electric power
Partnership for Equitable Growth	PEG	Partnership	Fossil fuels
Renewable Development Initiative	RDI	Programme	Renewable energy
Shanghai Cooperation Organization	SCO	Intergovernmental	

Source: UN ESCAP, *Energy Security and Sustainable Development in Asia and the Pacific* (Bangkok: United Nations, 2008).

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2007); Amrita Narlikar, *International Trade and Developing Countries: Coalitions in the GATT and WTO* (London: Routledge, 2003); Ngaire Woods and Leonardo Martinez-Diaz, ed., *Networks of Influence? Developing Countries in a Networked Global Order* (Oxford: Oxford University Press, 2009).

<sup>18</sup> Legitimacy is defined here as ‘a property of a rule or rule-making institution which itself exerts a pull towards compliance on those addressed normatively because those addressed believe that the rule or institution has come into being and operates in accordance with generally accepted principles of right process’. Thomas M. Franck, *The Power of Legitimacy among Nations* (Oxford: Oxford University Press, 1990), 24.

Table 2: Energy initiatives in Southeast Asia.

Initiative	Acronym	Type	Energy subsector
ASEAN Centre for Energy	ACE	Intergovernmental	
Asia-Pacific Economic Cooperation	APEC	Intergovernmental	
Ayeyawady-Chao Phraya-Mekong Economic Cooperation Strategy	ACMECS	Intergovernmental	Hydropower, renewable energy (biofuels)
Bay of Bengal Initiative for Multi-Sectoral Technical and Economic Cooperation	BIMSTEC	Intergovernmental	Electric power, fossil fuels
Brunei Darussalam-Indonesia-Malaysia-Philippines East ASEAN Growth Area	BIMP-EAGA	Intergovernmental	
Capacity Development for Clean Development Mechanism	CD4CDM	Programme	
Greater Mekong Subregion Programme	GMS	Programme	
Mekong Programme		Intergovernmental	Electric power
Partnership for Equitable Growth	PEG	Partnership	Fossil fuels

Source: UN ESCAP, *Energy Security and Sustainable Development in Asia and the Pacific* (Bangkok: United Nations, 2008).

## 2. Governing Energy Security

Although our economies are all highly dependent on uninterrupted supply of energy resources, no single authority is mandated to govern issues related to energy security. Instead, as Tables 1 and 2 have amply illustrated, there is a patchwork of loosely coupled rules and regulations, overlapping and sometimes competing, which amount to a regime complex.<sup>19</sup> This prompts us to ask:

- What are the key properties of complexity?
- How can we describe the regime complex for energy security?

### a. *The architecture of complexity*

A complex system can be described as one made up of a large number of units or building blocks that interact with each other and their environment in a non-simple way. The system as a whole is more than the sum of its parts. Knowing the building blocks does not necessarily create a holistic understanding of how the system behaves. Most importantly, as Brian Arthur has observed, ‘complex systems are systems in process, systems that constantly evolve and unfold over time.’<sup>20</sup> And they do so often in a non-linear way. The

<sup>19</sup> On the concept of the regime complex, see Kal Raustiala and David G. Victor, ‘The Regime Complex for Plant Genetic Resources’, *International Organization* 58, no. 2 (2004): 277–309; also Robert O. Keohane and David G. Victor, *The Regime Complex for Climate Change*, Discussion Paper 10-33, Cambridge, MA: Harvard Project on International Climate Agreements, 2010.

<sup>20</sup> W. Brian Arthur, ‘Complexity and the Economy’, *Science* 284 (1999): 107.

nonlinearities of complex systems create specific demands on optimal frameworks and the nature of intervention to steer desired outcomes.

First, adaptability, flexibility and voice are properties that enable cooperative mechanisms to address collective action problems effectively. These are essential within a policy environment that is in constant flux and that needs to offer voice opportunities for the respective stakeholders of collective action problem-solving. Second, the nature of intervention needs to be reflective of the complex nature of the policy environment. Complex systems make the extreme of coercing a desired outcome very difficult. In policy terms, this strongly suggests the need to create an environment that makes the system conducive to the natural development of favoured structures. In consequence, governments need to craft their policy interventions not with ‘a heavy hand [...] but a nudging hand’.<sup>21</sup> Third, complex systems quite frequently display hierarchical structures, a set of subsystems that are subordinate to an authority – formal or informal. At the same time, as Herbert A. Simon reminds us,

[m]ost of the complex structures found in the world are enormously redundant, and we can use this redundancy to simplify their description. But to use it, to achieve the simplification, we must find the right representation.<sup>22</sup>

Simplifying the description of complexity to identify entry points for cooperation must therefore become a primary concern before policies are crafted.

#### *b. The regime complex for energy security*

This section aims to simplify the description of the regime complex for energy security. The examples provided are for illustrative purposes only. The section does not provide a comprehensive mapping of the regime complex; nor does it attempt to evaluate the relative success of institutions in performing their functions or in their interaction with one another. This is beyond the scope of the paper and is a desideratum for future research.

The regime complex for energy security comprises institutions that perform three essential ideal-type functions: (1) setting rules and standards; (2) correcting market failures; and (3) lowering transaction costs.<sup>23</sup>

- Setting rules and standards

The first ideal-type function institutions may perform is to provide rules and principles that guide or constrain the collective activities of a group. The WTO is of primary importance at the global level, despite the fact that it has not yet recognised energy as a specific sector of trade. Since the WTO’s basic rules are applicable to all forms of trade, they also apply to trade in energy goods and services. Those rules can be enforced through the WTO dispute settlement mechanism. On the softer side of the legalisation spectrum are the communiqués of club-like institutions such as the G-x groups. The G-20 especially has become a high-level forum for discussing energy security issues. Its commitment to the gradual multilateral

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<sup>21</sup> Ibid., 108.

<sup>22</sup> Herbert A. Simon, ‘The Architecture of Complexity’, *Proceedings of the American Philosophical Society* 106, no. 6 (1962): 481.

<sup>23</sup> See Goldthau and Witte, *Global Energy Governance*.

removal of existing fossil fuel subsidies by 2020, as agreed at the Pittsburgh summit in 2009, illustrates this point.

At the regional level, East Asian governments have been traditionally reluctant to commit themselves to mutually binding multilateral rules and principles that effectively constrain state sovereignty. Nevertheless, recent initiatives such as the East Asia Summit's adoption of the Cebu Declaration on East Asian Energy Security in 2007 produced voluntary action plans and targets to enhance energy efficiency.

- Correcting market failures

The second function institutions may perform is to correct market failures. The IEA is a good example of an institution that does this. Established by the OECD after the 1973–1974 oil price shocks, the IEA provides a framework – via the IEP (established in 1974) and the CERM (established in 1979) – to cope with short-term oil supply disruption. However, given its limited membership, the IEA does not represent the global energy community. Key oil importers such as China and India are not formal members. The IEA therefore does not have the authority to develop and enforce a global system of mutually agreed energy rules.

Over recent years, a number of initiatives have been set up to prepare East Asia for potential oil supply disruptions and subsequent impacts on its economies. The ASCOPE (established in 1975), ASEAN's Petroleum Security Agreement (adopted in 2009), which includes a regional framework for CERM, and APEC's ESI (endorsed in 2001) are prime examples.

- Lowering transaction costs

Sharing and disseminating information about future energy trends constitutes the third important function of the energy security regime complex. Actively promoting transparency helps reduce uncertainty in international energy markets and facilitates policy planning. The IEF (established in 1991) is the world's largest gathering of energy ministers. It comprises IEA and OPEC countries as well as China, India, Mexico, Russia and South Africa, accounting for more than 90 per cent of the global oil and gas supply and demand. While the IEF is now formally governed by a charter (adopted in 2011), the document does not create any legally binding rights and obligations between or among its members.

At the regional level, the ACE (established in 1999) and the APNet (established by APEC in 2007) have played leading roles in information sharing and strengthening collaboration on energy research.

### **3. Understanding Cooperation in the Energy Security Regime Complex**

While Section 2 has provided a simplified description of the regime complex for energy security (with particular focus on East Asia), we now turn to the consequences of regime complexity. Cooperation in the energy security regime complex can be described as an open process where authority is contested and needs to be negotiated among the stakeholders of collective action problem-solving.

## *Cooperating on the formal-informal continuum*

Energy security cooperation is studied here through the lens of governance – processes and institutions, both formal and informal, that have the authority to forge collective action, to enforce particular collective action outcomes, and to make those outcomes acceptable to a wider audience. Institutions are defined here as clusters of connected norms, rules and principles (constitutive, transactional and societal) that are organised within stable, persistent and ongoing formal or informal social practices.<sup>24</sup>

The contemporary scholarship on international organisations and global governance offers several valuable insights on institutional design,<sup>25</sup> the role of informal networks and international regulatory regimes.<sup>26</sup> However, they provide only a snapshot of collective action problem-solving and miss out a significant part of the description and explanation by ignoring the area of governance where formal IOs and informal institutions come together.<sup>27</sup> This research lacuna is somewhat surprising. Scholars have long ago emphasised the importance of formal and informal processes in understanding the workings of organisations at the domestic level.<sup>28</sup> The processes and institutions of global governance are located on a formal-informal continuum across regions, with varying degrees of formalisation and legalisation. They may exist permanently or develop ad hoc around a specific issue.

The complex for energy security exists both at the global and regional levels. In 2008, the UN Economic and Social Commission for the Asia-Pacific counted at least 43 energy initiatives in the region (see Table 3).

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<sup>24</sup> This definition draws on Andrew Hurrell, *On Global Order: Power, Values, and the Constitution of International Society* (Oxford: Oxford University Press, 2007), 59.

<sup>25</sup> See, for example, Barbara Koremenos, Charles Lipson and Duncan Snidal, ed., *The Rational Design of International Institutions* (Cambridge: Cambridge University Press, 2004).

<sup>26</sup> See Anne-Marie Slaughter, *A New World Order* (Princeton, NJ: Princeton University Press, 2005); Wolfgang H. Reinicke, *Global Public Policy: Governing without Government?* (Washington, DC: Brookings Institution Press, 1998); Candace Jones, William S. Hesterly and Stephen P. Borgatti, 'A General Theory of Network Governance: Exchange Conditions and Social Mechanisms', *The Academy of Management Review* 22, no. 4 (1997): 911–45; Joel M. Podolny and Karen L. Page, 'Networks Forms of Organizations', *Annual Review of Sociology* 24 (1998): 57–76; Emilie M. Hafner-Burton, Miles Kahler and Alexander H. Montgomery, 'Network Analysis for International Relations', *International Organization* 63, no. 3 (2009): 559–92; Miles Kahler, ed., *Networked Politics: Agency, Power, and Governance* (Ithaca and London: Cornell University Press, 2009); a critical view on the potential and limits of networked governance is offered by Woods and Martinez-Diaz, *Networks of Influence?*; also Walter Mattli and Ngaire Woods, ed., *The Politics of Global Regulation* (Princeton, NJ: Princeton University Press, 2009).

<sup>27</sup> While the study of international regimes – defined as rules, norms, principles and procedures that focus actors' expectations regarding international behaviour – constituted an effort to theorise about global governance more broadly, efforts have been hampered by definitional problems of what exactly counted as a regime. See Beth A. Simmons and Lisa L. Martin, 'International Organizations and Institutions', in *Handbook of International Relations*, ed. Walter Carlsnaes, Thomas Risse and Beth A. Simmons (London: Sage, 2002), 192–211.

<sup>28</sup> See Chester I. Barnard, *The Functions of the Executive* (Cambridge, MA: Harvard University Press, 1938).

Table 3: International energy initiatives on the formal-informal continuum.

Intergovernmental	Partnership	Network	Programme
ACD	APP-CDC	ENERGIA	CAREC
ACE	BFA	GNESD	CD4CDM
ACMECS	ECO-Asia	INFORSE	CLASP
APEC	EESD	PEG (Pacific)	EUEI
BIMP-EAGA	IPHE		GMS Program
BIMSTEC	PCFV		GTI
BSEC	PEG		GVEP
ECNEA	PIESD		PIEPSAP
ECO	REEEP		RDI
ECT			SARI/E
EurAsEC			SASEC
Mekong Programme			SECSCA
PIFS			SEFI
SAARC			
SCO			
SOPAC			
SPECA			

Source: UN ESCAP, *Energy Security and Sustainable Development in Asia and the Pacific* (Bangkok: United Nations, 2008).

In the Asia-Pacific region, at the thinner end, we can see networks and partnerships such as ENERGIA, GNESD, INFORSE and BFA. These institutions develop a set of procedural norms governing, inter alia, membership, operational practices and decision rules. At the thicker end, however, are formal arrangements (e.g., ACD, APEC, ECNEA, ECT) that feature significant differences in their pattern of legalisation and formalisation.

In sum, with international organisations and state policies increasingly penetrating into domestic political systems, there seems to be a striking demand to move away from a rather statist theory of cooperation towards a more dynamic understanding of when collective action occurs and what generates wider acceptance for particular collective action outcomes. Consequently, we need to probe the sources of authority to engage in collective action, enforce collective action outcomes and make those outcomes acceptable to a wider audience.

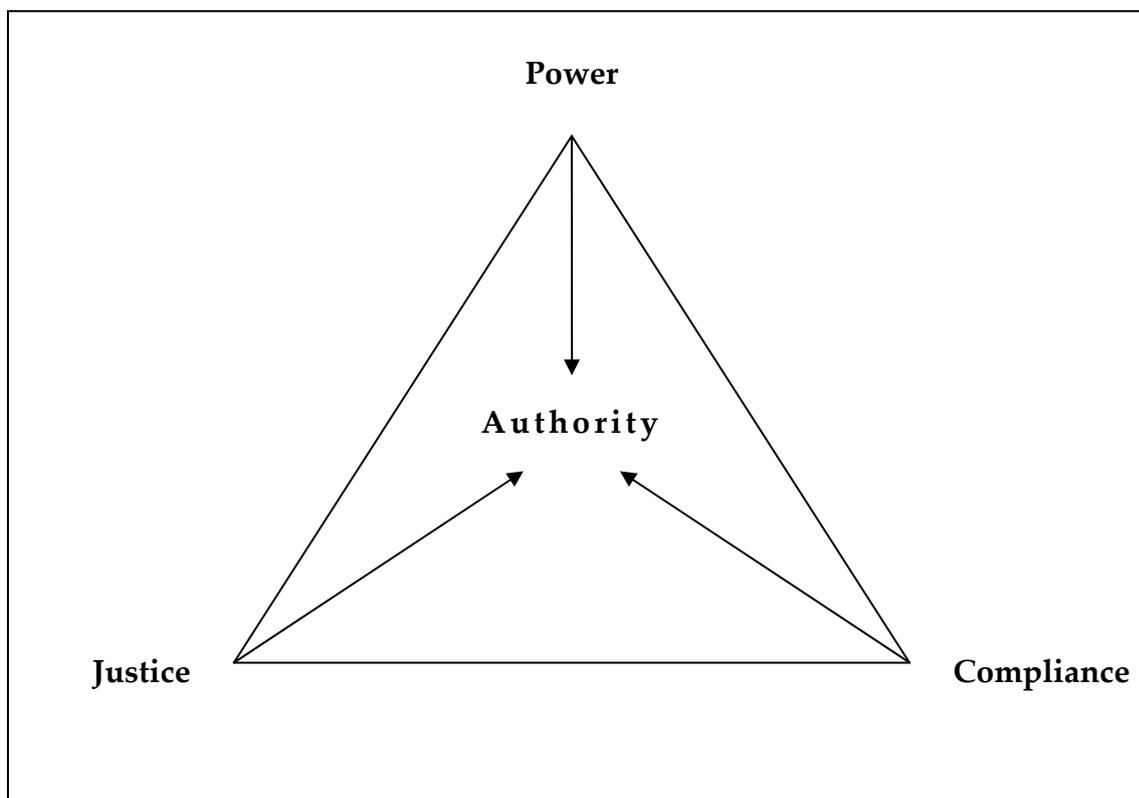
#### *Crafting authority*

The explanatory concept of authority is operationalised in terms of the following variables: power, justice and compliance. While the power variable looks at the ability of rule-makers to choose a particular course of action over another and to achieve a particular collective action outcome, the justice variable investigates the extent to which rule-takers perceive the outcome as legitimate, just and fair. The compliance variable examines two more

dimensions of authority: first, at the systemic level, the degree to which rule-makers and rule-takers act in accordance with their mutually accepted rules, obligations, practices and standards in addressing specific collective action problems; and second, at the system's level, the degree to which the grand bargain between powerful states and weaker states (where the powerful provide social order and the weak comply in exchange for security) is being upheld and is still intact. Power, justice and compliance form a triangular relationship that is mutually reinforcing (see Figure 1).

Formal organisations reflect the institutionalisation of the power, justice and compliance triangle at a certain historical juncture. Their authority is defined by the delicate balance among those variables. This institutionalisation tends to result in the maintenance of the status quo, given the sunk costs and a high degree of risk aversion to initiate adaptations in response to structural changes.

Figure 1: The authority triangle.



Source: Jochen Prantl, *Whither Liberal Institutions? European Union, NATO, and United Nations in the Post-Cold War Order* (Oxford: Oxford University Press, 2012), forthcoming.

However, IOs are affected by system and systemic change, which may challenge their authority and endanger organisational stability. These, in turn, affect decision-making, effectiveness and representativeness. Does this inevitably lead to the conclusion that IOs become unstable and ineffective in the face of change? Not necessarily; empirical evidence is much more diverse than this. Informal institutions may be instrumental in helping IOs

gradually adapt to system and systemic change without altering their formal structure and composition. In consequence, ad hoc mechanisms may serve as a stabilising element for IOs in transition.

Table 4 illustrates various international energy initiatives in the Asia-Pacific region by sub-sector, that is, energy, fossil fuel, electric power, renewable energy and energy efficiency. Each of the subsectors comprises a set of intergovernmental initiatives, programmes, partnerships and networks that can be located on the formal-informal continuum. As there is no single-authority institution to govern the energy security regime, creating collective action outcomes that are acceptable to a wider audience requires utilising cooperative mechanisms, either in sequence or in parallel, in developing collective action and assigning authority to implement it.

However, the absence of deep trust, as Rosemary Foot has argued, acts as a powerful constraint on deeper forms of regional cooperation in East Asia.<sup>29</sup> Two major consequences need to be highlighted: first, the continued reliance on formal global governance mechanisms in restraining regional state behaviour; and second, the importance of informal institutional arrangements in promoting trust and confidence among regional states. For example, efforts to build a regional energy market would ultimately need to rely on, or work in accordance with, the global rules and standards set by the WTO. Trade in energy goods and services is, in principle, regulated by the WTO and the General Agreement on Trade in Services. Since there is neither a separate agreement on energy goods nor a universal definition of energy services, the practical relevance of the WTO's existing formal rules and standards is therefore limited. Informal institutional arrangements may thus play an important role in fostering formal adaptations in WTO practice.

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<sup>29</sup> See Rosemary Foot, 'The Role of East Asian Regional Organizations in Regional Governance: Constraints and Contributions' (paper presented at the Shanghai Forum, Shanghai, 29 May 2011).

Table 4: International energy initiatives in the Asia-Pacific region, by subsector.

Energy		Fossil fuel	Electric power	Renewable energy	Energy efficiency
ACD	GMS	ACD	ACD	ACD	ACD
ACE	GNESD	ACE	ACE	ACE	ACE
ACMECS	GTI	APEC	ACMECS	ACMECS	APEC
APEC	GVEP	APP-CDC	APEC	APEC	APP-CDC
BFA	INFORSE	BIMSTEC	APP-CDC	APP-CDC	CLASP
BIMP-EAGA	IPHE	BSEC	BIMSTEC	ECNEA	ECNEA
BIMSTEC	PEG	CAREC	CAREC	GVEP	ECO
BSEC	PIEPSAP	ECNEA	ECNEA	IPHE	ECO-Asia
CAREC	PIESD	ECO	ECO	RDI	EESD
CD4CDM	PIFS	ECT	ECT	REEEP	ECT
ECNEA	SAARC	EurAsEC	EurAsEC	SAARC	GVEP
ECO	SARI/E	PEG	GTI	SEFI	PCFV
ENERGIA	SASEC	SAARC	Mekong		REEEP
EUEI	SCO	SARI/E	Programme		SAARC
EurAsEC	SOPAC	SECSCA	SAARC		SARI/E
			SARI/E		SEFI
			SPECA		

Source: UN ESCAP, *Energy Security and Sustainable Development in Asia and the Pacific* (Bangkok: United Nations, 2008).

Following from the above, the dynamics between informal institutional arrangements and formal IOs need to come under scrutiny. Expanding on the work of Lauth as well as Helmke and Levitsky, we can identify four ideal-type effects of informal institutional arrangements on the work of IOs: (1) accommodation; (2) complementation; (3) competition; or (4) substitution:<sup>30</sup>

- *Accommodation.* Accommodating informal institutions create voice opportunities for states, effectively acting as a safety valve that decreases the pressure for formal change.
- *Complementation.* Complementary institutions may enhance the efficiency of collective action by filling gaps in the institutional machinery of an IO.
- *Competition.* Competing informal institutions usually coexist with ineffective IOs, with a low degree of convergence in formal rules and procedures.
- *Substitution.* Substitutive informal institutions replace formal IOs by following their own rules and procedures to ensure effective collective action problem-solving.

The lack of power in achieving collective action outcomes has undermined the authority of Western liberal institutions, pushing states and IOs to decentralise core functions. However, justice concerns (e.g., procedural legitimacy, accountability, fairness) and compliance considerations exert a pull on the units of the international system to observe what one may

<sup>30</sup> See Hans-Joachim Lauth, 'Informal Institutions and Democracy', *Democratization* 7, no. 4 (2000): 21–50; Gretchen Helmke and Steven Levitsky, 'Informal Institutions and Comparative Politics: A Research Agenda', *Perspectives on Politics* 2, no. 4 (2004): 725–40.

call the primacy of procedures.<sup>31</sup> This primacy is bound to stay within the confines of IOs. Analysing the roles of domestic institutions, Luhmann has argued that institutional procedures help create broad public acceptance, a level of general tolerance that is distinct from agreement with the specific decision at hand.<sup>32</sup> Consequently, although IOs tend to lack power in achieving outcomes, the primacy of procedures in delivering justice and implementing compliance seems to make them indispensable. This is because the primacy of procedures translates collective action outcomes into something that is implementable, and is perceived as legitimate, just and fair.

#### 4. Conclusions

Despite the deep structural changes of, and challenges to, the global energy landscape, efforts to build a comprehensive energy security regime that is governed by a single authority are unlikely to succeed. It is most likely that under current circumstances the regime complex for energy security will persist, primarily due to the divergence of national interests, a weak incentive structure for governments to create integrated regimes and to adhere to a single set of rules, and the lack of strong hierarchies to coordinate energy policies. This raises important policy implications that need to be addressed. A regime complex may in fact have advantages over any integrated regime and can provide important building blocks for crafting energy security cooperation in East Asia, especially in terms of adaptability, flexibility and voice. These features are particularly pertinent in an environment of high vulnerability and uncertainty.

- *Adaptability*: Complex systems may allow for a multi-speed coordination of policies. Loosely coupled regime complexes may be able to adapt more easily over time than single-authority institutions, especially when there is no clear and clearly preferred strategy among members over the best course of action.
- *Flexibility*: Without a single-authority institution that sets the rules and standards for energy security, it is possible to create regulatory frameworks that accommodate different conditions on different issues across different regions, with different sets of actors involved. At the same time, informal institutions may provide cooperative frameworks with less strings attached which will, over time, help actors develop the necessary confidence and trust to commit to binding agreements.
- *Voice*: Regime complexes offer greater voice opportunities, especially for countries that are not represented in the central decision-making bodies of major institutions.

However, the decentralised nature of the regime complex may also have negative effects, as fragmentation may prevent it from innovation and produce deadlock instead. Forum-shopping is another matter of concern that is often mentioned.<sup>33</sup> How then should actors exploit the advantages of these three building blocks and avoid the potential pitfalls of the regime complex?

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<sup>31</sup> See Talcott Parsons, *The Evolution of Societies*, ed. Jackson Toby (Englewood Cliff, NJ: Prentice Hall, 1977); also Arthur L. Stinchcombe, *When Formality Works: Authority and Abstraction in Law and Organizations* (Chicago: The University of Chicago Press, 2001).

<sup>32</sup> See Niklas Luhmann, *Legitimation durch Verfahren* (Frankfurt am Main: Suhrkamp, 1983).

<sup>33</sup> See, for example, Karen J. Alter and Sophie Meunier, 'The Politics of International Regime Complexity', *Perspectives on Politics* 7, no. 1 (2009): 13–24.

### *Stakeholder bargain*

Prior to considerations about institutional design and effectiveness, there needs to be a sea-change in the thinking of the stakeholders of the regime complex: energy security is not primarily a vital national interest but a global public good that needs to be pursued under the conditions of complex interdependence.<sup>34</sup> Such a stakeholder bargain is the sine qua non of any effective regime complex. One of the most promising issue areas to engage in collective action is R&D investment for energy efficient and carbon-efficient pilot projects.

### *Multilateral pluralism*

The complexity of the energy security regime requires a cooperative engagement that takes advantage of the full spectrum of policy frameworks on the formal-informal continuum. More research is needed on how to foster mutually reinforcing dynamics of formal and informal cooperation in addressing collective action problems related to energy security. For example, R&D investment may be coordinated through an informal agreement – negotiated by the major R&D stakeholders within global and regional innovation core groups – which would then be formally adopted by an R&D framework convention that regulates access to clean technologies in a regional energy market.

### *Executive leadership*

Effective cooperation requires the reconciliation of competing demands. On the one hand, we need institutions that allow for the proper framing of a policy issue and the engagement of a critical mass of stakeholders in decision-making; on the other, we need executive leadership (e.g., through G-x groupings such as the G-20 or BRICS) that is committed to pushing a policy agenda forward and facilitating follow-up collective action and implementation. In the case of R&D, just six countries (the US, Japan, China, Germany, France and the UK) account for 85 per cent of investments in technological innovation.<sup>35</sup> At the same time, a recent comparative study suggests that countries with emerging economies such as Brazil, Russia, India, Mexico, China and South Africa ‘may have control over larger amounts of energy research development and demonstration funding than the governments from countries that are members of the IEA’.<sup>36</sup> There are considerable opportunities for cooperation in the areas of renewable energy and energy efficiency. In both cases, the obstacles to engage in policy coordination and to execute leadership are comparatively low.

In sum, there is no silver bullet for crafting energy security cooperation. Understanding energy security as a regime complex highlights avenues of cooperation that will often lead to a fragile achievement, requiring continuous support, negotiation and adjustment. This may

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<sup>34</sup> As Zha Daojiong has argued for the case of China: ‘Gone is the era of energy independence ... Also gone for China is the viable application of self-reliance as an ideology guiding its energy policymaking. ... In short, China has no choice but to learn how to live in a world of (complex) interdependence.’ Zha Daojiong, ‘Oiling the Wheels of Foreign Policy? Energy Security and China’s International Relations’, Asia Security Initiative Policy Series Working Paper No. 1, 2010, 4.

<sup>35</sup> Keohane and Victor, *The Regime Complex for Climate Change*, 23.

<sup>36</sup> Ruud Kempener, Laura D. Anadon, Jose Condor, ‘Governmental Energy Innovation Investments, Policies, and Institutions in the Major Emerging Economies: Brazil, Russia, India, Mexico, China, and South Africa’, Energy Technology Innovation Policy Discussion Paper No. 2010-16, Belfer Center for Science and International Affairs, Harvard Kennedy School, Harvard University, 2010.

strike some as sub-optimal and imperfect. But such an approach is clearly superior to a policy that frames energy security as a zero-sum game.