



Energy policy in the Caribbean green economy context and the Institutional Analysis and Design (IAD) framework as a proposed tool for its development



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HIGHLIGHTS

- Un-coordinated Caricom energy policy can benefit from an institutional analysis and design approach.
- Policy reform hinges on the patterns of interaction among key actors in the regional context.
- Regional policy remains weak across efficiency, equity, accountability and adaptability parameters.

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ABSTRACT

Market integration efforts of Caribbean small island developing states have become transposed on the growing paradigm shift towards green economy pathways. Central to this is the challenge of implementing Caribbean energy policy in a manner that is aligned with green economy ideals and face the realities of regional indebtedness and environmental impacts. Here we analyze the current state of the Caribbean energy policy development arena and propose that the currently weak policy and institutional design regime might potentially benefit from the application of the Institutional Analysis and Design (IAD) model especially within the operational context of the green economy. It allows us to identify current policy dilemmas, bottlenecks and discrepancies and to disentangle some of them while offering up a way forward with others. We do not so much offer distinct recommendations but focus more on delineating how to clear the pathway for sound policy intervention and outcomes. By doing so we set forth a challenging agenda for future policy analysis research that will advance Caribbean energy policy in more robust ways.

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1. Introduction

The Caribbean Community (CARICOM) comprises fifteen countries including Antigua and Barbuda, the Commonwealth of the Bahamas, Barbados, Belize, the Commonwealth of Dominica, Grenada, Guyana, Haiti, Jamaica, Montserrat, Saint Kitts and Nevis, Saint Lucia, Saint Vincent and the Grenadines, Suriname, and Trinidad and Tobago. The areas of functional cooperation include: health, social welfare, culture, education and training, youth and development, labor, transportation, ICT, telecommunications, climate change, disasters, the Caribbean Sea, energy, agriculture, and crime. In terms of energy, the CARICOM energy policy is

“fundamental transformation of the energy sectors of the Member States of the Community through the provision of secure and sustainable supplies of energy in a manner which minimizes energy waste in all sectors, to ensure that all CARICOM citizens have access to modern, clean and reliable energy supplies at affordable and stable prices, and to facilitate the growth of internationally competitive regional industries towards achieving sustainable development of the Community”(CARICOM, 2011).

Renewable energy, energy conservation and energy efficiency are critical elements of a green economy transition. In addition to greenhouse gas reductions, renewable energy use for power generation is critical to the sustainable energy future of the Caribbean. Energy conservation is an established mitigation option in its own right, but is also considered to be the twin dimension of renewable energy interventions that improves the latter's impact. Even further, some scholars have also advanced energy efficiency as an adaptation mechanism (Berrang-Ford et al., 2011). It is therefore

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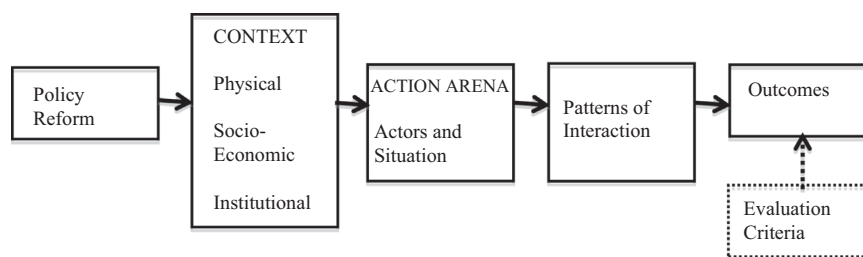


Fig. 1. Application of the IAD Framework.

an important part of achieving green economy objectives in the Caribbean, especially since a large percentage of imported energy is wasted or lost during conversion and transmission and via end-use devices Fig. 1).

Achieving this in the context of SIDS may pose particular challenges due to their overwhelming reliance on imported fossil-based energy resources and the limited deployment of energy systems that utilise indigenous renewable energy resources (Niles and Lloyd, 2014). Transforming behavior patterns related to energy use, particularly as it relates to energy conservation, may also be a challenge.

Regional and global agreements on climate change mitigation targets and incentives are also driving investment in renewable energy, especially in the industrialized nations and some large emerging economies. To a large extent, mitigation is not a policy priority,¹ given the Region's relatively low contribution to greenhouse gas emissions and the exclusion of Caribbean countries from international target agreements (though this may change within a post-Kyoto context and environment). However, the cost of energy for domestic and commercial use is very high in many Caribbean countries, offering both potential supply-side and demand-side opportunities for alternative sources and increased efficiency.

"In fulfillment of the goal of the CARICOM Energy Policy and to assure access to affordable, adequate, safe and clean energy products necessary for the development of Member States and for the consolidation of the CSME (established by the Revised Treaty of Chaguaramas), the Community will develop a programme of regional actions in a coherent and comprehensive way in pursuit of the following objectives:

- (a) Sustainable and secure energy supplies through diversification of energy sources;
- (b) Accelerated deployment of renewable and clean sources of energy supplies towards increased energy supply diversification and affordability;
- (c) Sustained growth of intra-Community trade in energy;
- (d) increased energy efficiency and conservation in all sectors, including the transportation sub-sector;
- (e) Establishment and enforcement of labeling and standards for the importation of electrical appliances as well as standards for vehicles importation;
- (f) Increased investment in production, transformation and distribution of viable energy resources;
- (g) Strengthening and enhancement of the human and institutional capacities in the Community energy sector;
- (h) Programmed expansion of electricity generation, transmission, distribution and trade;
- (i) Improved access to affordable energy by the poor and vulnerable;

¹ The Carbon Reduction Strategy of Trinidad and Tobago and the Low Carbon Development Strategy of Guyana are examples of policy mechanisms within the Caribbean that have prioritised mitigation, and as such, are notable exceptions to the primary focus on adaptation.

- (j) Greater use of renewable energy for electricity generation as well as in the transportation, industrial and agricultural sectors;
- (k) Coordinated approach to exploring and establishing an institutional framework for leveraging financing mechanisms for the development of viable energy resources;
- (l) Increased technology transfer and information sharing;
- (m) Established regional and national targets for emissions reduction with corresponding mitigation actions;
- (n) Strategies for maintenance of adequate energy reserves in the event of disasters; and
- (o) Strengthened research, development and innovation efforts in energy sector especially in areas of clean and renewable energy sources and technologies." (Caribbean Community (CARICOM) Secretariat, 2013).

The above objectives are meant to be undergirded by the Caribbean Sustainable Energy Roadmap and Strategy (also known as the C-SERMS project) which is meant to provide a strategy for achieving the aforementioned objectives. The strategy will therefore provide an implementation framework that engages all Member States and relevant stakeholders and includes quantitative regional level targets for sustainable energy that are informed by data pertaining to potential energy resources and human and institutional capacity within the region. In this regard, the C-SERMS Baseline Assessment and Report published in September 2015 aims to provide a platform for enhanced policy coordination and cooperation. The document provides regional level (along with proposed National) targets for renewable energy, energy efficiency and reductions in greenhouse gas (GHG) emissions. In fact, based on a earlier draft of that document, in March 2013, the Commission on Trade and Economic Development (COTED), approved a regional renewable energy target of 48% of installed power capacity by the year 2027 (Ochs et al., 2015). The CSERMS Baseline Assessment and Report also proposes that regional energy intensity² (used as a proxy to assess energy efficiency) be reduced to 33% from 2012 levels by 2027 (applied evenly across all member states) and that Carbon Dioxide (CO₂) emissions be curtailed by 46% (set against business as usual projections made in 2012), also by 2027 (Ochs et al., 2015).

This links directly to the tenets of the green economy/ low carbon development pathway which can be considered as one with a system of economic activities related to the production, distribution and consumption of goods and services that results in improved human well-being whilst not exposing future generations to significant socio-economic and environmental risks as well as ecological scarcities. The three converging issues that sparked the GE concept – climate change, the global economic crisis and sustainable development – are all highly relevant to the

² The C-SERMS Baseline Assessment and Report argues that energy intensity can serve as an effective proxy for assessing energy efficiency improvements and defines energy intensity as the productivity of energy use, measured by assessing units of energy inputs per unit of economic output, typically measured in GDP.

Caribbean. SIDS have been identified by the UNFCCC as being among the most vulnerable to climate change impacts, particularly those related to sea level rise and the increased frequency and intensity of hurricanes. The anticipated impact of climate change on Caribbean SIDS is therefore highly disproportionate to their small contribution to greenhouse gas emissions.³

In this paper our objective is to review the current Caribbean energy policy development process and progress to date and secondly to suggest how one policy development method – the institutional assessment and design (IAD) framework – might aid in strengthening those policy development processes and outcomes. We propose that through the IAD framework, we can understand the current state of institutional infrastructure, processes, strengths and weaknesses as well as propose critical intervention points to reinforce and/or build the institutional context that will be able to support Caribbean energy policy and its attendant strategies, especially those objectives that promote a clean energy transition and the green economy pathway. In the sections that follow we lay out the current institutional and policy context in the Caribbean, specifically as it relates to CARICOM, following which we introduce the IAD framework and work through its main principles. We end with some suggestions based on the proposed IAD framework, for the substantive questions related to a clean energy transition and also note the utility and limits of further more in depth usage of the IAD as an analytical basis to support policy development.

2. Charting the Caribbean green economy context

In 2011, the Alliance of Small Island States (AOSIS) postulated that implementation of green economy initiatives should also include blue economy considerations in light of the vast ocean and marine resources possessed by SIDS (Thomson, 2011; Williams, 2011). The international island grouping also noted that any new structure “of institutional Framework for Sustainable Development should include within its core mandate strengthening the implementation of the BPOA [Barbados Plan of Action] and the MSI Mauritius Strategy for the further Implementation (MSI) of the BPOA” (Williams, 2011). Moreover, the Alliance highlighted that emphasis should be placed on strengthening and increasing financing mechanisms, on combating climate change and on implementation, in accordance with the principle of common but differentiated responsibilities (Thomson, 2011; Williams, 2011).

CARICOM has already noted that several of its Member States have “developed or, are in the process of developing sectoral policies, sustainable development strategies, strategic and medium term planning programs and natural resource management frameworks that serve as the basis for a greener, low-carbon economic transition that at the same time addresses the issue of poverty eradication and the broader goal of sustainable development”⁴ (CARICOM, 2011). In addition, the St. George's Declaration of Principles for Environmental Sustainability which was

formally endorsed by the Organisation of Eastern Caribbean States (OECS – a sub-grouping within the Caribbean) makes specific commitments, among other things, to “integrate social, economic and environmental considerations international development policies, plans and programs” (Principle 2) “use economic instruments for sustainable environmental management” (Principle 6), to “address the causes and impacts of climate change” (Principle 8) and to “protect and conserve biological diversity” (Organisation of Eastern Caribbean States (OECS), 2006).

The policy response of SIDS to advancing a green economy transition has been underscored by a response to common threats – particularly climate change. The associated impacts of a warming planet, including sea level rise and the increased frequency and intensity of natural hazards, constitutes a significant component of the policy responses geared towards greening their economies. In this way, a natural nexus can be said to exist between climate change policy and mechanisms geared towards advancing a green economy transition. This relates firstly to initiatives geared toward boosting adaptation (and to a lesser extent, mitigation) efforts and to enhancing responses to the impacts of climate change policies implemented by developed nations.

In addition to combating climate change, the thrust toward a green economy transition has also caused policy makers in island economies to place greater emphasis upon biodiversity conservation, ocean governance and resource management. Moreover, island economies (and coastal nations) have been at the forefront of calls for a specific focus to be placed on the opportunities presented by the ‘Blue Economy’. This has been bolstered by calls for all SIDS to reorient and re-identify themselves as ‘Large Ocean Island States’ (as aforementioned). This potentially paradigm-changing move is geared toward optimising the opportunities presented by the blue economy, which in short, calls for oceans and seas to be viewed as ‘development spaces’ that are subject to spatial planning. This thrust has created a policy environment that encourages nations to formulate strategies geared toward optimising the potential benefits that can be accrued from within their Exclusive Economic Zones (EEZs). This includes policies, agreements and/or regulations pertaining to fisheries, transshipment and bioprospecting, tourism and to the mining of seabed mineral resources. As it relates to energy policy however, seas and oceans offer vast potential, not only for conventional oil and gas exploration and production, but also for renewable “blue energy” production from wind, wave, tidal, thermal and biomass sources. A focus on the blue economy therefore seeks to manage or regulate such activities, to ensure that they are conducted in a manner that is environmentally benign, socially inclusive (particularly in terms of job creation, local capacity building and skill transfer) and economically viable – especially as it relates to ensuring fair and equitable opportunities for all and returns to the state (in terms of revenue from the economic activity).

Finally, regardless of the policy mechanism or economic activity proposed to advance the transition toward a green (or blue) economy, SIDS have often used international fora to voice their concerns over the dearth of financial resources available to implement required programs and policies (Faure, 2012; Thomson, 2011; Williams, 2011). Island economies have therefore been united in their call for the international community to provide the development finance, support and technology transfer required to facilitate enhanced biodiversity conservation, increased use of renewable energy resources, strengthened ocean governance and improved resource management – including land use planning – as examples of the conditions which characterise a green economy transition (Shah et al., 2016).

³ The notable exception in this regard really to Trinidad and Tobago, which was ranked as having the second highest carbon dioxide emissions per capita and the seventh highest carbon dioxide emissions per GDP. For more see: Boodlal et al. (2008), Trinidad and Tobago's CO2 Inventory and Techno-economic Evaluation of Carbon Capture Options for Emissions Mitigation *Tobago Gas Technology Conference (TGC)*. Tobago, Trinidad and Tobago, W.I.

⁴ To support this, CARICOM made specific mention of the Barbados Green Economy Strategy, the Dominica Organic Isles Initiative and the Guyana Low Carbon Development Strategy, and the carbon reduction strategy announced by Trinidad and Tobago which aims at transforming the existing consumption-based economic growth through the efficient use of resources, minimizing pollution through use of environment-friendly technologies and generally supporting green industry.

Table 1

Brief survey: renewable energy capacities and policies in CARICOM Member States (2012). Sources: (Niles and Lloyd, 2014; Ochs et al., 2015).

Country	Current Renewable Electricity Generation (Approximate % of Total)	Specific Energy-Related Measure/Target
Antigua and Barbuda	< 1%	
Bahamas	0	<ul style="list-style-type: none"> • 20% of electricity from RE by 2020 • 15% of total energy from RE by 2030 • 15% of electricity from RE by 2020; 30% by 2030 • 10% residential self-generation by 2014
Barbados	< 1%	<ul style="list-style-type: none"> • 29% of electricity from RE by 2029 • 20% of total energy from RE by 2026
Belize	65% ^a	<ul style="list-style-type: none"> • 89% of electricity from RE by 2033
Dominica	27.5%	<ul style="list-style-type: none"> • 100% of electricity from RE by 2020 (through addition of geothermal)
Grenada	< 1%	<ul style="list-style-type: none"> • 100% of electricity from RE by 2030
Guyana	< 1%	<ul style="list-style-type: none"> • 90% of electricity from hydro development; 15,000 solar home systems installed (no date given)
Jamaica	9.3%	<ul style="list-style-type: none"> • Import Duty reduced from 30% to 5% on all renewable energy devices • Zero rating for GCT purposed on renewable energy equipment
Haiti	14.5%	<ul style="list-style-type: none"> • 20% of electricity from RE by 2017 • 28% of electricity from RE by 2022 • 46% of electricity from RE by 2027
St Vincent & the Grenadines	19.12%	<ul style="list-style-type: none"> • Components for renewable energy systems exempted from customs duties on case by case basis • Compact Fluorescent Lamps fully exempt from excise tax and VAT
Saint Kitts and Nevis	5.7% ^a	<ul style="list-style-type: none"> • 20% of electricity from RE by 2015
Saint Lucia	< 1%	<ul style="list-style-type: none"> • import duties and consumption taxes on renewable energy equipment and materials eliminated. • purchase of solar water heaters tax-deductible. • 30% of electricity from RE by 2020
Montserrat	0	100% of electricity from geothermal and solar by 2020
Suriname	34.3%	None
Trinidad & Tobago	< 1%	<ul style="list-style-type: none"> • 10% of electricity from RE by 2021 • Solar Water Heaters (SWHs): <ul style="list-style-type: none"> • No VAT or import duty • Tax Allowance: 25% value of equipment up to max of \$10,000 (for Residential Use) • 150% wear & tear allowance (acquired by Commercial enterprises) • Wind Energy: <ul style="list-style-type: none"> • No VAT or import duty on turbines & supporting equipment • 150% wear & tear allowance (on turbines) • Energy Efficiency: <ul style="list-style-type: none"> • 150% tax allowance on cost of energy audit • 75% accelerated depreciation on capital incurred in acquisition of energy efficiency systems

^a Figures for 2015 – sourced from the National Renewable Energy Laboratory (NREL), US Department of Energy.

2.1. The Green economy – energy policy nexus in Caribbean SIDS

Table 1 provides a survey of existing published energy policies in Caribbean SIDS and their links to green economy principles. This reveals firstly, the primacy or emphasis placed on enhancing the deployment of renewable energy technologies (particularly in the power sector) in SIDS. In addition, while a number of island economies have opted to utilise fiscal mechanisms to enhance the use of alternative energy sources, time-bound targets have been the most common policy mechanism used to promote renewable energy deployment within SIDS.

Put simply, a number of the energy policies of SIDS intersect in the following areas that are relevant to a green economy transition⁵:

The promotion and deployment of renewable energy technologies - the table above makes clear the intention of SIDS to increase the current uptake of clean energy, particularly in the power sector. This is driven particularly by a desire to reduce vulnerability to volatile global order prices.

(a) Promoting green investment. Though dominated by supply side incentives, a number of mechanisms have been put

forward by SIDS toward this end, including the removal of the VAT and customs duties as well as other fiscal incentives. The measures put in place by Trinidad and Tobago for Solar Water Heaters and Wind Energy, and by Saint Lucia and Jamaica on all renewable energy technologies (RETs) (as seen in table above) are examples of this.

- (b) Promoting and encouraging energy efficiency and conservation. The thrust towards energy efficiency is driven primarily by technology diffusion. In this way, policies are designed to ensure that old inefficient technologies are phased out and replaced with cutting-edge, more efficient alternatives. This is also pursued through labeling and certification programs that aim to incentivise or encourage the purchase of devices that are comparatively more energy efficient (including, but not limited to, cars and appliances). Energy conservation on the other hand, is often pursued through behavioral programs that seek educate and engage a public about ways in which they can reduce their energy consumption⁶ as well as through more stringent requirements for demand-side management and integrated resource planning on the part of electricity utilities and industry.
- (c) Treating with climate change as a matter of environmental responsibility. A number of SIDS have adopted a policy of

⁵ The factors listed herein are not unique to the Caribbean and are also applicable to SIDS from other regions of the world, such as those within the Pacific and Indian Ocean.

⁶ Such programs are often geared toward encouraging more sustainable use of consumer goods (such as appliances).

pursuing RETs and low carbon development strategies as a means of “setting an example for larger countries with respect to responsibly and sustainably reducing greenhouse gas (GHG) emissions” (Government of Tonga, 2010). Additionally, a number of SIDS view the implementation of mitigation programs as an essential component of energy sector planning and development that can be utilised to reduce negative environmental climate change impacts while enhancing adaptation efforts through the consideration of principles of environmental sustainability (Government of Kiribati, 2009).

- (d) Prioritising low carbon development - a number of SIDS have recognised that clean energy technologies not only reduce their vulnerability to volatile oil prices, but also serve to help place their economies in a position of enhanced competitiveness and sustainability. As a result a number of the policy frameworks seek to drive low carbon development in a manner that is congruent with a green economy transition, that is, pursuing economic activities that are commercially viable, socially inclusive and environmentally sustainable (Marconnet, 2007; Government of St Vincent and the Grenadines, 2009). This is significant as it represents explicit attempts on the part of SIDS to utilise energy policy frameworks not only to strengthen national economic performance⁷ but also to place their economies onto sustainable trajectories (CARICOM, 2013; Government of Tonga, 2010; Secretariat of the Pacific Community, 2010).
- (e) Identification of social development as a key component of energy policy. As it pertains to SIDS, this has primarily occurred in two ways. Firstly, access to energy (particularly in the form of electrical power) is still a primary source of concern in many SIDS, especially for multi-island nations in the Pacific and Indian Ocean and in Haiti, in the Caribbean.⁸ The ability to extend electricity to rural communities has profound implications on the ability of individuals, households and communities to facilitate social (and economic) activities, such as night-time reading or the refrigeration of food. The second and final area often addressed within the strategic energy policy frameworks of SIDS relates to social inclusion in terms of community engagement/involvement in energy-related investments as well as through local content provisions. The former is particularly important in light of the need to adequately address the densely populated nature of some islands (like Barbados) and/or communal land ownership (which is very common in the Pacific). Energy policies within SIDS have therefore at times, placed a special emphasis upon the social impact of deploying RETs (as an example). Notwithstanding this, it should be noted that policy frameworks have highlighted the need for social impact assessments as well as for community engagement and education - but are yet to sufficiently address the economic involvement of community members in investments being made in the energy sector - in terms of equity, employment or joint ventures with local firms. That said it should be noted that a large number of energy policies for SIDS have made mention of the potential of green investments to stimulate job and wealth creation. This is particularly important as it is likely contribute to the creation of green jobs and in some cases, it will facilitate a transition from ‘brown to green’ jobs - especially if/when power utilities move from conventional to renewable electricity generation facilities.

3. A structured approach to institutional and policy analysis

The Institutional Analysis and Development (IAD) framework has been described as ‘one of the most developed and sophisticated attempts to use institutional and stakeholder assessment in order to link theory and practice, analysis and policy’ (Aligica, 2006). It has been suggested that it remains ‘the only major policy theory or framework to be based on institutions.’ Yandle (2007) observe that the framework has proven ‘useful in understanding a wide variety of institutional arrangements in both developed and developing countries.’ It avoids many of the ‘pitfalls’ encountered by other approaches to institutional analysis by emphasizing ‘the careful consideration of contextual factors’ as well as ‘the full range of transaction costs.’ Consequently, ‘it contains no normative biases and does not presume a priori that one type of institutional arrangement is preferred to another.’ It also uses a variety of criteria to assess institutional performance.

The Institutional Analysis and Development (IAD) framework is one of several approaches to conducting institutional analysis (Ostrom, 1990; Ostrom et al., 1994). However, a strength of the IAD approach that will benefit the Caribbean context is principled, organized approach to analyzing the strength and capacity of current Caribbean institutional arrangements to advance energy policy that underpins the green economy transition. The approach emphasizes the careful consideration of contextual factors and it draws attention to the full range of transaction costs, which are significant in the Caribbean regional context. It contains no normative biases and does not presume a priori that one type of institutional arrangement is preferred to another while using a variety of criteria to assess institutional performance.

The application of IAD approaches in theory, proposition and actuality are evident in the energy sector in many geographic, political and sector contexts. There is precedence of success through use of the IAD lens, a few of which we point out as illustrations. Escribano (2013) turned to the IAD framework to propose policy directions for Ecuador’s energy policy given the complexity of political and economic objectives, which were historically difficult to reconcile in a consistent manner. Many of these complexities are also evident in the Caribbean context including for example the domestic oil and gas industry of Trinidad and Tobago and the massive oil importation bills of the eastern Caribbean islands; the burgeoning potential of the latter islands geothermal energy potential (much like Ecuador’s untapped hydroelectric resources); and the necessities of attracting foreign financing but maintaining fierce control of the national patrimony (a commonality with Ecuador’s socio-political traditions). Bryner (2007) used the IAD lens to analyze the challenges of developing a diverse domestic energy portfolio in the western United States. The approach was particularly valuable because Bryner tackled the dual challenges of integrating energy and climate change policy at a juncture in time where the sector was highly unstable and precarious due to foreign energy dependence (much like the historic situation of the Caribbean exists). Bryner also deftly unpeels the layers of actors including foreign, national and sub-national agents to delineate power relations and propose probable outcomes of strategic policy options. Reis Amorim (2013) based an analysis of Brazil’s sustainable development efforts in its electricity sector on the IAD framework. It was employed here largely as an effective way to visualize the complexity of the electricity generation institutional framework and how the sector sustainability was assessed in the present time. From this assessment Reis Amorim then extrapolated policy positions in accordance to ‘green state theory’. The latter also suggests the strength of the IAD in its ability to integrate with other conceptual paradigm; a point of importance given the increasing political motions in the Caribbean to transition towards ‘green economy’ concepts.

⁷ Such an approach is not only based on research which links GDP growth to energy use, but also to the fact that sudden increases in the price of oil of have had significant adverse impacts upon the economies of SIDS in the past.

⁸ Twenty-five (25%) of the Haitian population was said to have access to electricity in 2010.

3.1. Examining the contextual setting

The contextual setting or what [Ostrom \(1990\)](#) calls the ‘action arena’ stems the broad CARICOM community of member countries and more specifically the energy value chain across each country. With the exception of Trinidad & Tobago, the only net exporter of energy in the region, the value chains within other CARICOM countries consist of foreign energy suppliers; local power generators, distributors and retailers (often the same entity); regulators and consumers of the commercial and domestic varieties on the other side of the equation. For institutional analysis the emphasis on the question ‘who creates the rules of the game’? The IAD framework suggests focusing attention on three sets of contextual factors discussed below.

3.1.1. Physical setting

To be effective, the rules governing the promotion of clean energy policies must be compatible with the underlying physical settings and the nature of the resources being managed ([Ostrom et al., 1994](#), 44). Since there is often considerable variation in physical settings, resources, and resource management problems, a search for the rules that set the stage for a regional level approach presents a significant institutional challenge. For example in terms of physical settings and resource availability for clean energy proposition, wind and solar may seem more obvious. In the eastern Caribbean states geothermal projects are gaining ground. Still, distribution and transmission (and in some cases power generation) structures across the region are largely government monopolies with outdated or inefficient infrastructures ([IDB, 2016](#)). While renewable energy deployment is a real possibility there is much trepidation about practical and legal access to national grids by non-utility scale independent power producers (IPPs) – especially on the part of residential and commercial end users.

Notwithstanding the above, the relative geographic isolation, remoteness and small size of Caribbean and Pacific and Indian Ocean island economies help to make indigenous energy production more attractive – though in the Caribbean, the proximity of other petroleum producers (like Venezuela and Mexico) tend to offset the effects of geographic isolation.⁹ Moreover, in the case of multi-island nations like the Bahamas, the additional cost of transportation from the port of entry to ‘more remote or outer islands’ makes power generation and energy imports even more expensive ([Weisser, 2004](#)). Efforts to mitigate these impacts by reducing fuel imports through energy conservation, energy efficiency as well as through promoting a transition to renewable energy can also serve as an important component of a green economy transition.

3.1.2. Attributes of the community

This includes norms of behavior, level of common understanding, homogeneity of preferences, and the distribution of resources. It also includes relevant political and socioeconomic factors. The term “culture” is often applied to this bundle of variables. Cultural factors often play a role in energy usage and consumption and influence the development and administration of rules governing electricity-pricing policies. For example, a critical shift towards energy conservation and energy efficiency retrofitting in the

regional hotel industry has gained much traction in the last decade but not so in the domestic household markets even when devices such as LEDs and CFLs can be accessed (abet at higher retail prices). Historically heavily subsidized across the region, electricity costs are both high on the domestic consumers’ budget and low on the general politicians’ list of issues to tackle while in office as removing subsidy programs would likely translate into increased prices.

3.1.3. Existing institutional setting

Institutional change tends to be incremental and path dependent rather than totally reconstructive or destructive ([Imperial, 1999](#)). Regional energy policy has been incremental and sequential to date but recent accomplishments such as the CARICOM Energy Policy, the CSERMS Baseline Assessment and Report along with green economy studies in several member countries have been vital in increasing member country confidence, particularly as it relates to making larger commitments of finances and other resources (including political) to further the agenda. When viewed over time, these changes will allow the region to improve the capacity of relevant institutions. The process tends to be path dependent because each institutional change transforms the structure of incentives within which future decisions are made. Thus the regional decision-makers including CARICOM should consider how a policy change in the present, enhances or constrains future policy options. Moreover, much like state power generation monopolies across the region, the longer a rule system stays in place and the more sophisticated and complex it becomes, the more likely it is that political decision makers will encounter difficulty when trying to make changes.

3.1.4. Rules in use – multilateral and bilateral

High energy prices (for electricity and transport), combined with enhanced global awareness of the climate change impacts, have helped to create a policy environment that lends itself to facilitating increased energy efficiency and to the enhanced use of renewable energy sources. This has been buoyed by a global thrust toward the ‘greening’ of economies. A green economy transition has been identified as being complementary to the framework of the Barbados Plan of Action (BPOA) ([United Nations General Assembly, 1994](#)) and the Follow-Up Mauritius Strategy for the further Implementation of the BPOA.¹⁰ Indeed, it has been highlighted that many priority areas for action, including energy and tourism sectors, waste management and coastal and marine resources, straddle both agendas (i.e. the green economy and the BPOA) as part of an overall thrust to push SIDS toward sustainable development.

The United Nations Environment Programme, in examining the unique case of SIDS, indicated that a transition to the green economy could be facilitated by greater regional policy coordination and cooperation as well as increased activities focussed on capacity building, technology transfer and targeted financial assistance ([UNEP et al., 2012](#)). In this regard, the SIDS Accelerated Modalities of Action Pathway – which is the outcome document emanating from the 3rd International Small Island Developing States Conference in 2014 - endorsed the green economy as an important tool for achieving sustainable development and poverty reduction, and calls upon the United Nations system to strengthen its support of SIDS that wish to develop and implement green

⁹ Yet still, for the majority of the world’s SIDS, a limited demand for petroleum imports to service local energy requirements has meant that small territories are unable to benefit from economies of scale when purchasing oil on the international market ([Niles and Lloyd, 2014](#) [Weisser, 2004](#)). Additionally, many SIDS do not straddle or rest on major international transportation routes. As a result, small island nations are at times obliged to pay transportation premiums to have oil delivered to their shores.

¹⁰ The MSI sets forth actions and strategies in 19 priority areas, which build on the original 14 thematic areas of BPOA. New additional thematic areas in the MSI include graduation from least developed country status, trade, sustainable production and consumption (as called for by the JPOI), health, knowledge management, and culture. For more see: <https://sustainabledevelopment.un.org/index.php?page=view&type=13&nr=367&menu=1361>

economy policies. In this regard, it should be noted that the conduct of scoping studies to guide a transition to a green economy in several Caribbean territories (namely Haiti, Barbados, Saint Lucia and Jamaica) was endorsed via a concept note at the thirty-seventh Special Meeting of the Council of Trade and Economic Development of CARICOM on Environment and Sustainable Development.¹¹

3.2. The action arena: actors and the status quo

Several SIDS have drafted energy policies, in order to set targets for the deployment and uptake of renewable energy technologies (particularly in the power sector) and to create an enabling environment for private sector participation, particularly in the clean energy sector. It should be noted that the formulation of energy policies in many SIDS was due in no small part to the influence of donors that provided technical and financial support in order to facilitate the formulation of energy policies (Niles and Lloyd, 2013). It has been argued that the general thrust towards codified energy policies was driven in part, by a desire on the part of donors to create an enabling environment for investment from power companies, technology/equipment suppliers and project developers from their source countries.

Irrespective of the motives or actors that may be driving policy formation, the existing energy policies in SIDS (both formal and informal) have often served to establish targets for the penetration of clean energy technologies and have also helped to promote and encourage 'green investment' opportunities in the power, transport, heating/cooling technology sectors as well as opportunities related to energy efficiency and conservation (Shah and Rivera, 2013). They have also assisted in the development of regulatory frameworks that serve to establish guidelines and stipulations pertaining to the participation of the private sector and on matters related to pricing (of electricity and fuels) as well as to Health, Safety, Security and the Environment.

3.3. Patterns of interaction: transaction costs

There are three types of transaction costs associated with developing and implementing clean energy policy for the green economy: (1) information costs; (2) coordination costs; and, (3) strategic costs.

3.3.1. Information costs

Information costs are those associated with searching for and organizing information and the errors resulting from an ineffective blend of scientific and time and place information. This is obtained from the regional expert community in industry, academia and government. There is a growing cadre of experts versed in the particular state of variables such as resource potential, cost-benefit analysis and legal implications that would necessarily provide understanding of the state of such variables within the current context. Foundational indigenous scientific expertise that can marry local context and leading edge innovative capabilities and skills remain significantly underdeveloped largely because of the severe lack of research and development tradition, resources, institutions and 'triple helix' arrangements¹² in the region.

Effective energy policy requires an effective blend of both scientific and time and place-specific information. In the green economy it is necessary not only to understand the renewable

energy potential and capacity of different jurisdictions and the region as a whole in order to harness it, but also to grasp the supply-consumption dynamics of the marketplace. Information and data also has to be complete, satisfy quality requirements for decision-making, continuously updated and revisited and accessible to those in decision-making roles. In this regard it is hoped that the recently established Caribbean Centre for Renewable Energy and Energy Efficiency (CCREEE)¹³ would help to enhance the "development, adoption and execution of regional and national gender sensitive RE&EE policies, targets and incentives through targeted regional interventions" (Caribbean Centre for Renewable Energy and Energy Efficiency Secretariat, 2016).

3.3.2. Coordination costs

Coordination costs are those invested in negotiating, monitoring, and enforcing a regional clean energy policy. This includes the costs to develop policy proposals and the corresponding costs associated with negotiation, bargaining, and public comment necessary to obtain approvals by decision-makers. Accordingly, to the extent that the transaction costs associated with interagency meetings and negotiations are high, national institutions such as relevant ministries of energy and regulatory commissions may be reluctant to participate in decision making or may do so on an informal or sporadic basis at the regional CARICOM level. The various legal structures within each country or territory that govern policy approaches to energy may also reduce opportunities to coordinate as a region. In this regard, it is hoped that the C-SERMS initiative can serve to reduce and optimize coordination costs. There are also longstanding business arrangements and contractual obligations with multinational foreign suppliers that are so institutionalized as to be politically sensitive in nature. Coupled to that is the Petrocaribe arrangement which some member states have with Venezuela although this may be reaching an eventual turning point given Venezuela's floundering economy.

3.3.3. Strategic costs

Strategic costs result from asymmetries in information, power, or other resources such that some member states obtain benefits at the expense of others. Common strategic costs include free riding, rent seeking, corruption, collusion, and turf guarding. Politically within the member ranks for instance are the Organisation of Eastern Caribbean countries. As mentioned, Trinidad & Tobago as a net energy exporter to the region occupies a unique political and leverage space and other countries with growing clean energy potential will be cautious about how such regional energy approaches play into nationalistic strategic objectives. For example, Jamaica has significant investments in ethanol biofuels and more recently in wind farms. As a result, member countries and their respective stakeholder ministries and agencies may be reluctant to enter into cooperative relationships when there is suspicion that the benefits may not be equitably distributed or they will be investing more than others for less competitive gain. Rent seeking may be the most common strategic behavior observed as member countries seek an umbrella regional policy through which they can extract more rent in the form of income or revenue from clean energy sources or the reduction in imported energy supplies because of it.

3.4. Assessing overall institutional performance

Here we describe how the IAD framework could be applied to the Caribbean energy policy-making process. Based on the IAD

¹¹ UNEP, "Project Note: Advancing Caribbean States' Sustainable Development Agenda through Green Economy Policies", 2012.

¹² The triple helix concept points to government-industry-academia value chain linkages that move relevant economic value added innovation towards commercialization.

¹³ CCREEE was inaugurated on October 28, 2015.

framework, there are four interrelated performance assessment criteria relevant to reviewing if and how current institutional arrangements can contribute to clean energy policy within a green economy framework. These are (1) efficiency, (2) equity, (3) accountability, and (4) adaptability.

3.4.1. Efficiency

Efficiency can be viewed in many ways. Economic efficiency focuses on the magnitude of the change in the flow of net benefits associated with an allocation or reallocation of resources into clean energy rather than fossil fuels or the traditional energy supply relationships. The heavily institutionalized bureaucracy-based government and energy importer-supplier-purchaser arrangements are often inefficient from the perspective of limited government budgets and utility gains from subsidies to the market. Accordingly, when comparing alternative institutional arrangements for the energy transition envisioned at country and regional levels, it is important to consider how revisions in rules affecting participants will alter their behavior and production, consumption and usage patterns.

Administrative efficiency has to be considered especially in this discussion that centers largely around government and public sector intervention. Given variations in institutional design, it is hard to make generalizations about administrative costs. Moreover administrative efficiency may be reduced by the removal of inappropriate jurisdictional boundaries that fail to conform to regional operational conditions that have to be agreed upon at the CARICOM level. Bureaucratic and market-based approaches to regional clean energy promotion are likely to have high administrative costs. One possibility can be to seek co-management arrangements within member countries with stakeholders that already have a vested interest, such as power generators, while still coordinating resources with other member countries on a regional level.

3.4.2. Equity

Policy makers should also consider whether a regional approach with a regional decision-making process is fair and results in an equitable distribution of gains, whether viewed from the perspective of horizontal or vertical equity. The IAD framework draws attention to two equity concepts. Fiscal equivalence holds that those countries benefitting from any regional policy should bear some burden of financing it. Redistribution equity is concerned with structuring benefits flowing from policy around differential abilities to contribute to overall policy outcomes. An efficient policy for the region to meet its regional level objective may not necessarily be a fair one. As a result, there are frequent trade-offs between efficiency and equity. For example, though not immediately obvious, member countries that have been severely devastated by a hurricane, at times can be more easily retrofitted or equipped with infrastructure that can immediately support any clean energy transition benefits flowing from a regional policy position. It may therefore be appropriate to undertake such works at that time in lieu of an approach or policy that ensures that similar work is undertaken in every member country. Alternatively, policy rules can also inadvertently create inequities or have distributional impacts beyond the energy sector to end users in heavy manufacturing or tourism (as examples).

3.4.3. Accountability

An important principle is that governing institutions can be held accountable for their actions. There are many formal and informal accountability mechanisms, which at times will reduce efficiency or adaptability. Therefore, within the CARICOM framework, a policy approach that requires accountability from country level focal points, namely ministries of energy or other specialized

policy authorities, is appropriate.

3.4.4. Adaptability

Getting the rules right takes a long time. Unless national institutions have the capacity to respond to changing environments and information then regional mechanisms for moving forward are likely to suffer. One obstacle to adaptability is that changes in rules often impact in-country resource allocations in ways that cause various vested interests or stakeholders to resist change, such as energy suppliers with long-time standing. Accountability mechanisms can also impede adaptability. Sometimes this pressure makes it difficult for decision makers to change rules. Conversely, too much adaptation and change in response to political pressure can create problems when changes occur before value chain stakeholders can determine how to cope with changes.

4. Outcomes: institutional gaps and reorientation to support policy

Policy analysts must recognize current institutional arrangements may be insufficient and structures less than optimal to support a clean energy transition within the context of a green economy. But clearly there are many opportunities to increase the likelihood of such a policy objective being realized through critical interventions in the current institutional arrangements at regional and national levels within CARICOM. As with regional policy processes in the past (though not often mentioned), it also raises social and cultural issues that must be clarified through deliberation and consultation. Ultimately, the selection of policies and the institutional arrangements used to implement such arrangements is a political decision. Some specific areas for further policy analysis are suggested below.

4.1. Deepening multilateral collaboration

Though a few individual SIDS and universities have begun to bolster the energy-related research they conduct (including the Scientific Research Organisation of Samoa, the University of the West Indies and the University of the South Pacific), there is to significant scope to deepen cooperation among island economies in this sphere. Greater emphasis upon research and development can help to ensure that solutions being advanced are uniquely tailored to the socio-economic and environmental challenges faced in SIDS. In this regard, it should be noted that research geared towards science and technology, policy and energy planning as well as the commercial deployment of technology based solutions is urgently required.

The Caribbean Climate Innovation Centre (CCIC) seeks to tackle the lattermost of those areas. The CCIC was developed under a Global partnership programme known as infoDev,¹⁴ within the World Bank and is one of eight such centers that exist across the world.¹⁵ The CCIC provides proof of concept funding for high impact new ventures that are focused on resource use efficiency (including waste-to-energy, materials recovery and reuse and recycling), water management, sustainable agribusiness, solar energy and energy efficiency. This multilateral initiative exists to support and develop the entrepreneurial capacity of clean technology businesses – especially those engaged in research, in order to facilitate market penetration. The CCIC therefore also supports iterative testing and prototyping of clean technology solutions and

¹⁴ See www.infodev.org for more information.

¹⁵ The eight Climate Innovation Centers are located in Kenya, Ethiopia, India, South Africa, Vietnam, Morocco, the Caribbean and Ghana.

seeks to accelerate access to capital for nascent or “early growth-stage” Caribbean companies. Research-to-market initiatives such as these represent valuable forms of regional/multilateral co-operation and technical knowledge sharing that can help to strengthen the deployment of environmentally benign technologies within SIDS, and could perhaps be considered for other regions of SIDS as well (Shah et al., 2014).

4.2. Pooling regional service delivery

Small size, geographic isolation and diseconomies of scale often characterises the principal challenges faced by SIDS when attempting to deliver public goods and services to local populations. Joint/regional solutions therefore seek to lower the cost of service delivery through bulk procurement or enhanced coordination. Bulk fuel procurement is one such area that has been explored, particularly in the Pacific, as a means of reducing the costs associated with transportation and diseconomies of scale. It has been explained that regional organizations in the Caribbean and Pacific have both expressed interest in “multi-country bulk fuel procurement whereby several nations can purchase larger quantities of fuel so as to benefit from economies of scale”. While this is particularly beneficial to smaller islands, in practice, it has been exceedingly difficult to execute, due in part to the need to harmonize legislation, fuel standards and procurement rules across jurisdictions. The construction of fuel storage facilities that would be accessible to other nations is also an important precursor to regional bulk fuel procurement. In the Pacific, competition between island states to become a regional ‘hub’ for fuel storage also delayed the process of reaching an agreement on bulk procurement (Dornan and Newton Cain, 2014).

Such an approach is congruent with green economy transition not only because it increases efficiency, but due to the fact that it can also serve to enhance region – wide resource management coordination and make the delivery of public goods and services more inclusive. In this regard, it should also be noted that pooling resources in order to enhance regional service delivery has also been attempted for fisheries management in the Pacific – through organizations such as the Forum Fisheries Agency (FFA)¹⁶ and the Parties to Nauru Agreement (PNA)¹⁷ which have had positive results (Dornan and Newton Cain, 2014).

Pooling resources can therefore not only be considered a more efficient means of service delivery, but it can also serve to enhance technical and policy coordination. Hence, in the thrust towards a green economy, encouraging region – wide service delivery and the pooling of resources can help SIDS to overcome some market related barriers related to a lack of resources and technical skills. Moreover, multilateral collaboration of this nature can facilitate the formation of supra-national regulatory commissions or support organizations that can assist in creating an enabling environment for investment in green technologies.¹⁸

4.3. Policy analysis objective and analytical approach

How do we position energy policy within the broader public policy context of the green economy agenda in order to create

¹⁶ The FFA provides member states with technical assistance and services in fisheries management, and promotes fisheries development in the region.

¹⁷ The PNA is primarily a coordination mechanism for placing limits on commercial fishing among members.

¹⁸ As an example, the Eastern Caribbean Energy Regulatory Authority (ECERA) was an attempt to create such a supra – National organisation that would have facilitated the participation and investment of independent power producers in member states of the OECS - but this initiative did not gain traction among members of the sub regional Caribbean organisation. See more at: <http://www.oecs.org/our-work/projects/ecera#sthash.EFmeIn0l.dpuf>.

synergies and greater opportunities for sustainable development? How will supply side and demand side energy policies be positioned to gain traction and support plans and strategies for results in the short and long term?

Design of energy policy should take the following objectives into account:

- Facilitating Broad – based participation
- Promoting a bottom to top approach to governance and stakeholder engagement: one that takes the end-user into account, particularly as it relates to energy consumption and behavior modification.
- The provision of incentives: a strategy of resource efficient development must provide the incentives to reconsider trajectories of industrialization and untie the link between development and carbon. Incentivising energy-related circular economy opportunities should be a priority
- The ‘polluter pays’ principle: environmental costs must be internalized, to facilitate competition and make environmental investment profitable - in a manner that is not socially exclusive.
- National and regional capacities to sustain green economy efforts

With this in mind, it should also be noted that the implementation of the objectives, targets and strategies contained within the C-SERMS Baseline Assessment and Report are critical in terms of a green economy transition. Political capital as well as institutional support from national government agencies will be vital if the CARICOM’s Energy Unit is to serve as a “central platform for collaboration, information sharing, and resource coordination” (Ochs et al., 2015) in the region. Notwithstanding this, the process of implementing the regional or national targets that have been agreed upon will undoubtedly impact upon (and provide valuable lessons that could be applied to) other aspects of a green economy transition, such as social and environmental policy reform.

5. Conclusions

We have deliberately outlined the IAD framework as a proposed tool for determining whether the institutional structures exist, or could exist, at the CARICOM regional level to support a regional clean energy policy in light of the increasing call for green economy development pathways. The potential utility of the IAD approach in making headway is realistic, however we must also point out several caveats. First, as with any complex policy discourse, there will exist a constellation of institutional arrangements to meet policy objectives, some deemed more effective, efficient and/or equitable than others. We do not advocate for any particular set of institutional arrangements based on these criteria, but point out that the politics of the day usually weighs heavily in this regard, especially so with CARICOM regional policy as has been observed in the past in other policy spheres such as movement of labor, trade balances and territorial rights (Arthur, 2015).

Second, setting the institutional framework for policy success entails balancing considerations of transaction costs, efficiency, equity, accountability, adaptability, or other criterion; and history suggests that even if this could be achieved, risk, uncertainty and unknowns in the operating environment can well lead to otherwise unexpected results. One recent example has been the shifting negotiations around Venezuela, Trinidad and Tobago and Guyana about territorial waters and hence sovereignty of oil and gas reserves (Burn et al., 2015; Strüver and Wegenast, 2016). Venezuelan position dictated by political and economic turmoil with Trinidad and Tobago potentially in a position to significantly augment its

fossil fuel reserves and Guyana possibly becoming a more prominent player in the oil and gas sector were it to gain the reserves (Golinger, 2015). Thus, we should remember that while policy outputs and outcomes are often affected by institutional design and performance, they are not always the product of institutional performance.

Policy analysts must clarify and define the challenges and objectives to help decision makers. This requires understanding how institutions work as the backbone of policy delivery, who benefits and loses, how it changes incentives, whether the policy is likely to accomplish what was intended, and how it can be improved or discontinued. All of this is context related. Therefore important contextual factors affecting institutional design and the full range of transaction costs that influence institutional performance must be debated. Given the multiple and competing policy objectives that underlie a regional clean energy policy, it is important to use a various cross-sectional criteria to assess overall institutional performance and understand the trade-offs that exist between them. Moreover, institutional arrangements and the rules that comprise them can be extremely complex when dealing with multiple countries from a regional perspective in a region and policy field fraught with uncertainty. An IAD approach is therefore potentially useful for the region where at the least it provides a clear, logical analytical method to accommodate complex multivariable assessment; and at its most ambitious, provide a clear institutional development pathway to promote successful policy decisions. That being said, the proof of its utility lies in its application using full data and information. By laying out the framework here as a roadmap, this is the challenge we call policy makers to embark on.

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