

Advancing a culture of effective energy statistics and information management

A study of the CARICOM economic space

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Abstract

Purpose – The purpose of this paper is to identify and analyze the issues associated with the use of modern energy statistics and information management (ESIM) constructs as information sharing and decision-making mechanisms in the Caribbean community (CARICOM). The study focuses on the strategies required for advancing accepted regional goals of the creation and utilization of ESIM systems in the CARICOM energy sector, a vital precursor to national and regional generation and integration of energy information.

Design/methodology/approach – Primary and secondary data from CARICOM countries were analyzed, supported by an assessment methodology which examines the impact of the current state of the environment, and the policy imperatives on the data.

Findings – The research findings suggest that the creation and usage of energy statistics and information in the region is minimal. Several issues impact negatively on utilization, including political, visibility, awareness, resource, and cultural factors.

Originality/value – There are several possible alternatives for improving the state of ESIM in the region, and better understanding the peoples of the region, and the approaches to regional integration and development are instructive in deciding on the best approach. The solutions articulated in this paper are intended to achieve more inclusive high-value modalities of operation, optimize skills development and knowledge transfer, and positively impact the decision-making processes at both regional and state levels.

Keywords Energy, Caribbean integration, CARICOM energy policy, Energy information management, Energy planning, Energy statistics, ESIM

Paper type Research paper

Introduction

For decades, successful businesses in the world have used to their competitive advantages, the means to collect, store and process large volumes of information. In the Caribbean economic space, because of the high-energy costs associated with the operations of businesses in the region (Caribbean Electric Utility Services Corporation, 2016), energy data have become an important addition to the management information mix. Transformation to this new reality is often made possible using energy management and information systems solutions, a featured modality of contemporary business operation which has now taken root in many types of productive operations. As enterprises seek to integrate energy solutions into their strategic business plans, regional governments are required not only to introduce policies to align with these changing realities, but also, to promote mechanisms through which policy initiatives may be implemented and monitored. In a sense, regional stakeholders are now being conditioned to the development and use of a robust protocol for effective energy statistics and information management (ESIM) to aid decision-making processes (Gardner, 2017).

A scan of the environment presents no definitive interpretation of ESIM as a unified branch of knowledge, but rather isolated and individualized definitions. For the purposes of this research, the definition proffered is of a hybrid nature with inputs from regional experts



in the field of energy. ESIM is therefore described as “A structured mechanism through which required data elements are arranged to optimally support diagnosis, analysis, and decision-making for the sustainable development of the energy sector within a state, or defined region” (Gardner, 2017).

Properly integrated ESIM systems are known to build credibility, fiscal leveraging, and investment opportunities (Gardner, 2017). ESIM allows for precise planning in the energy sector and aids budgetary predictions, particularly as it relates to balance of payment pertaining to energy. ESIM tools could also help governments to more accurately determine the foreign currency outflows (e.g. the procurement of fuel) and to model subsidy programs (Carrera, 2017). Two examples are the LPG subsidy in Ecuador and the subsidy on kerosene in Jamaica, resulting in the emergence of serious black market challenges for both countries. Better quality decisions could have been taken in both instances if appropriate systems were in place to generate the data to support decision-making processes. A determination of the opportunity loss because of the inadequate implementation of an ESIM system is outside the scope of this paper.

The Caribbean community (CARICOM) member states, like many other developing countries, are vigorously exploring means that will strengthen their approach to the utilization of processed energy information at the management and policy levels, to grow and develop their economies. According to the regional experts, most of the member states have articulated policies that can seemingly aid such a direction but the respective governments now need to take this a step further (McIntyre, 2016; Carrera, 2016a, b). The evidence gathered in conducting this research suggests, that except for a few countries, noticeably, Barbados and Jamaica, weak infrastructural support mechanisms and inadequate technical capabilities are, in part, seriously inhibiting the use of ESIM systems in the region (Blanco and Oxilia, 2016). Given the importance of energy in the regional economic space deliberate actions to strengthen regional energy security must be given focused attention for implementation.

A major challenge in better understanding the dynamics of this intractable problem in the region is the unavailability of published work specific to the issue. There is an abundance of energy information from different publishers in and around the region that speak to growth challenges (Tabernacki, 2015), development options (Caribbean Development Bank, 2014), country-specific performance (Castilia, 2012; Whiteman *et al.*, 2016), investment opportunities in the Caribbean (Mian, 2013), among others. Some of this information can be accessed through key stakeholder establishments, mainly government ministries with energy portfolio responsibilities in the respective CARICOM member states, CARICOM itself, the Latin American Energy Organization (OLADE), the Caribbean Electric Utility Services Corporation (CARILEC), and some higher education institutions. However, much of this information is filed away in the form of technical reports that are scarcely accessed, unknown to most stakeholders, and poorly implemented at best. The collective information could be of immeasurable value if it resided in an integrated, properly managed digital platform.

The International Monetary Fund (IMF) (2015) asserts that protracted unresponsiveness or non-adherence to sound recommendations pertaining to policy changes geared at assuring long-term sustainability is quite common among the member states. The reasons are known to vary, but the IMF concludes that the major challenge resides with policymakers and their management of conflicting objectives. Considering the prevalence of this issue, it is indeed reasonable to assert that coordinating efforts between, CARICOM, OLADE, CARILEC, the major regional universities, and other key research-based organizations within the region could aid in facilitating some of the solutions to this huge regional problem, especially in light of the energy information, management tools, and technical capacity these establishments are known to possess. This however would require

a policy development shift of epic proportion that employs an integrated implementation mechanism that is both deliberate and inclusive.

This study identifies and analyses the root causes for the under-utilization of known and proven ESIM solutions. Social, political, region-dependent, governance-related, technological, institutional, developmental, and resource factors are discussed. A platform for achieving a cultural shift toward the creation and utilization of ESIM systems is proposed.

Study method and data

Observations from the literature review were combined with analysis of the data obtained from questionnaires and interviews to gauge policy effectiveness and to provide an in-depth understanding of the research landscape and additional insight into the research objectives. The data capture construct was based on international standards supported by in-country visits to meet the requirements of depth, confidentiality, and sensitivity to contextual variations in meaning. The data-gathering charts consisted of six categories: energy policy, policy effectiveness, data collection, information management, decision-making process, and energy target accomplishments. Each category was then measured by four indicators and each indicator rank-ordered as an independent variable. The average for each category was measured on a scale of 1-10 and the average for each indicator measured on a scale of 25 percent. The outputs were then compared with the performance results for the respective member states. Secondary research data were obtained from document reviews including national energy policies, studies, technical assessments and reports.

The effort then applied an integrated assessment methodology similar in nature to that outlined in the UNEP (2009) guidance manual to examine the potential impact and utility of policy in the energy sector throughout the region, and the implications for the economy because of the disposition of quality decision making at the policy level. Contextually, this methodology is an interdisciplinary exercise, which finds common ground for the interpretation and communication of expertise from various relevant disciplines in a way that highlights the economic, social and environmental impact associated with a policy.

Because of the nature and characteristics of the area of research, it was considered prudent and relevant to utilize a combination of methods to fully explore not just the signals from the data under review, but also, the impact of the current state of the environment and policy imperatives.

Results

This section of the research presents the observations and findings from the analyses of the field data gathered. Several issues were identified that appear to be impacting the development and utilization of ESIM in the region:

- Political factor – of the 20 CARICOM member states and associates, 19 published national energy policies. The national energy policy for the British Virgin Islands was not reviewed, as said was unavailable at the time of data collection. Except for Grenada, Haiti, Jamaica, and Montserrat, no policy had any specific reference to an energy statistic and information management mechanism, though 70 percent, at varying degrees, referenced an energy data base and/or an information management system, as a strategic policy imperative. There were no explicit statements around a mandate to set up this capacity in the short term.
- Visibility factor – research data from the 15 member states and 5 associate member states of CARICOM suggest that only six countries have taken the appropriate actions that could be reasonably interpreted as the steps toward the adoption and implementation of energy information and management systems. These countries are

at various stages of implementation of an ESIM system (Figure 1). The data obtained from the questionnaires and interviews further suggest that even for those countries that have started the implementation of elements of the system, none are utilizing the system to its full potential. The implementation of ESIM as a regional imperative is still quite low-key and so wider adoption is slow in coming.

- Awareness factor – in conducting the field visits, the observations suggest that throughout the region, there is a technical capacity deficit at all levels within the organizations that could naturally assume the responsibility for ESIM. Both state and industry functionaries appear to be insufficiently sensitized to the relevance and importance of ESIM in the energy sector, an observation which is seemingly ubiquitous. Most of the countries reviewed were not equipped with the suitable planning and ESIM tools, and were unaware of their efficacy. Of most of the countries reviewed, there was no evidence of any real transitioning from concept to actual program implementation, even in instances where there is adequate and relevant data to support decision making. The “pain” factor seems to be absent and/or well contained and the need for assimilation of these technologies is not felt sufficiently.
- Resource factor – a serious knowledge and personnel gap was evident in all countries considered in the study. There is widespread inadequacy of dedicated energy trained personnel in most of these countries, some are further plagued with a high staff turn-over, and all are bereft of adequate tools necessary to conduct analyses and to assure optimal use of information at hand.
- Cultural factor – a key observation emerging from the interviews is that some quantity of knowledge and data is being hoarded, even by state functionaries, and is not readily available on a platform where it can be summarily analyzed and utilized to the benefit of the country or region. The custodians of this information cite reasons of “confidentiality,” and in instances provisions under the “Secrecy Act,” a relic of the colonial era. This pattern of behavior was observed in the excess of 80 percent of the countries reviewed and is believed to be sustained by absent, inadequate, and/or poorly managed accountability systems.

Discussion

The presence of policies in the majority of countries is suggesting an acknowledgment of the importance of the energy sector as a key pillar for long-term sustainability. Reasons for the exclusion of specific reference to ESIM, or a homogeneous mechanism, from the general policy framework for the countries considered could not, in any definitive way, be determined from the data collected and assessed. However, a likely interpretation may be because of the anachronistic approach to regional policy development and implementation construct, unfamiliarity with global best practices in energy statistics creation and usage, and the leisurely shift toward the use of data supported decision-making techniques.

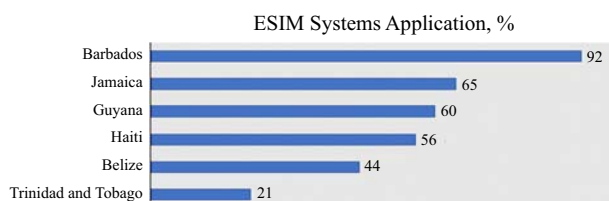


Figure 1.
Percentage
implementation of
ESIM systems
(January 2017)

It is not all together a grave omission for an energy policy to not speak specifically to ESIM in the context of a management construct or the availability of tools, provided there is a robust mechanism for its inclusion evolving from the policy itself. As is the case in Guyana, the strategies for implementation may then include the supporting tools. Only three of the countries reviewed appeared to be in a state of readiness to engage in the use of robust ESIM systems. There is a school of thought that the limited use of ESIM type tools and techniques at the policy level in any country, given the importance of energy, as a matter of course, will negatively impact the economy (Gardner, 2017). The economic impact was not a part of the scope of this study and as such was not assessed.

A further deduction from the study is that there is no structured mechanism, nor any indication of priority for the application of ESIM tools and technique to aid decision making in most countries. The evidence suggests that, except for Barbados, Guyana, and Jamaica, elements of an ESIM construct were utilized not necessarily by policy design, but fortuitously. On the upside however, the limited use of a formal system presents an opportunity to all countries in the region to adopt best practice protocols in the use of ESIM tools and techniques. This however, may be accomplished in large measure only after addressing other fundamental deficiencies.

For example, challenges such as the deficit of appropriately trained personnel, and shortcomings with the methodology for data collection, analysis, and processing (Carrera, 2016a, b) present a barrier to development, and threaten long-term sustainability. This suggests that appropriate quality control measures are not inherently a feature of the construct, even at the data collection stage. If generators of the source data are better equipped to collect and manage the data collection process in an organized and standardized manner, superior results are guaranteed. This in part is observed to be a motivating factor and featured prominently when gathering the primary data.

The paucity of ESIM tools was not solely because of a resource deficit, but also because of a lack of awareness of the development of the area and the tangible benefits to be garnered with its use. The implication is that, even with adequate information, its application at the decision-making levels could be rendered ineffective, primarily because decision makers as assessed, were unaware of the value and utility of ESIM mechanisms. In addition, the apparent absence of an impact analysis of this specific knowledge area in the region means that decision makers in the respective member states will be unable to access the value-added benefits such an analysis could bring to the decision-making process.

The findings highlighted the severity of the ESIM resource constraint in the region and are applicable to all member states at varying degrees. On the face of it, there is an appearance that this resource constraint is because of a deficit of capital, but this does not tell the full story. The field data suggest that in many instances the absence of skilled personnel across all levels suppresses the dialogue necessary to bring about the desired interventions, to include the creation of energy units and the recruitment of technical specialists in the field. This in turn, is itself an inhibitor to growth in the sector and negatively impacts long-term sustainable development.

Additionally, experts in the field assert, that even if all the other factors were addressed, respective member states would still be challenged with the implementation and maintenance of a national ESIM system. For example, some analysts debate that “data hoarding,” albeit mainly at the state level and cultural in nature, creates an information deficit which in this sense is treated as a key resource. This is true whenever sound data are not shared. Invariably, this practice, as observed during the data-gathering stage, leads to duplication of efforts and is defeatist in nature. This further highlights the importance of placing focused attention on resource optimization.

Recommendations and conclusion

There are several possible future scenarios, each of which has significant implications for long-term sustainable development. Member states could individually and deliberately pursue a path for the development of ESIM in their respective energy sectors which if properly managed promises much success, but the cost will likely be burdensome. Second, respective member states may take the business as usual approach and continue their current paths, in which case development will be slow, ineffective, and ultimately costly. For the third scenario, member states could coalesce around the idea of a unified ESIM and support mechanism, championed by CARICOM, which promises a lot of success and will likely be less burdensome in terms of cost. This path would likely involve a shift that takes advantage of the opportunities to be gained from the effective utilization of ESIM systems, in the process achieving a range of developmental goals by integrating technological, social, and economic objectives. A major concern however is, there are serious gaps between the present and desired state in all the countries reviewed, although preliminary works have been done in some countries. A key element of an implementation phase would include the following five measures so that future policy decisions are better informed in this regard:

- (1) Programmatic integration is aimed at fostering regional energy integration by promoting the optimization of related activities and sustainable energy development in member countries through cooperation, coordination and consultancy. While such an integrated program might suggest greater overall efficiency, integrated programs often happen more in theory and less in practice. An ESIM success would therefore require demonstrated stakeholder commitment and cooperation to include the sharing of experiences and lessons learned, the generation and dissemination of energy statistical information in member states, as well as a high level of coordinated interactivity (Orquera, 2016). This requires agreement on a collaborative protocol through which all stakeholders can work together to ensure that their individual needs are met. This of necessity will require, from the design stage, the creation of an ESIM gateway to enable stakeholder inputs, data storage, processing, retrieval, communication, and ultimately the use of the information to aid decision making. This however, is not a panacea as a state of opulence will never be attained unless the leadership in the region observes this to be critical and respond accordingly.
- (2) Knowledge transfer is an enabling platform for resource optimization and attempts to organize and distribute sector-related knowledge at all levels along the energy spectrum. This is useful not solely for an immediate response to the challenges at hand, but in adherence to the best industry practice and as a key component in any strategy for long-term sustainability. Consideration for knowledge transfer is further on the understanding that, getting the right information, to the right people, at the right time, is a critical component to success from a sustainable development perspective.

Throughout the research, it was observed that, some functionaries had information they were unaware of, and at instances though aware, they had no appreciation of the value of the information. At instances, the value of the information was recognized, but individuals were unaware as to how to transfer said information into a more tangible applicable output, which is a barrier to development. It is for these reasons, among other, that focused attention must be placed on knowledge transfer.

A knowledge transfer initiative would likely include the strengthening of both local and regional technical experts, and other key stakeholders within participating member states. Planners, regulators, managers, and advisors at the policy level form the core of this group. The transfer of knowledge could take place on many fronts, but in the main by way of face-to-face and online training, documenting successes and

lessons learnt by each territory during the implementation phase, supported by content creation and dissemination and networking initiatives.

- (3) Energy planning at the national level in any country provisions for the development, purposing, and application of a robust sustainable energy management program. In the regional context, it appears quite appropriate if energy planning were pursued in a manner to promote and implement a common policy, legal, and regulatory framework, but in a harmonized manner. Using such an integrated approach allows for improved energy data management and analysis, which redounds to the benefit of the peoples of the region.

Evidence from the research suggests that not all countries have adequately demonstrated an affinity to energy planning and as such the outcomes from an economic development perspective were not readily visible. Additionally, poor energy planning capabilities or interest is known to be a root cause for slow transition to ESIM systems. This suggests that countries with partial planning mechanisms in place will likely have to improve on these systems, and countries with barely any recognizable planning systems may likely have to introduce such systems.

An appropriate response to the energy planning challenges in the region may reside in the development of energy planning capacity. Capacity building is however not the end of the journey, as the systems in place must now be able to aid the transition of information to tangible practical applications. There is therefore the need for governments to tout energy planning as a national priority and underscore its importance by resourcing units, and specifying inflexible targets and timeframes for accomplishing desired objectives.

- (4) Behavioral modification is a measure to aid in closing the gaps earlier described, and is aimed at replacing undesirable behaviors with more desirable ones through positive reinforcement. This observation and subsequent recommendation is based on the authors' interpretation of the conditioning of many energy sector functionaries within the CARICOM geographic space. It is not the objective of the authors to prescribe a solution which transcends an academic interpretation.

A shift in cultural norms may take a generation but this is a requirement that starts with a comprehensive review of the related challenges and culminates with a consolidated sectoral framework with "buy-in" and inputs from the key regional stakeholders. Such a framework will also include agreements on access to information and a debunking of the confidentiality issue which will stimulate openness and transparency. However, a precursor to operationalizing this approach is a robust awareness program to sensitize regional stakeholders, and appropriate performance management systems to aid performance assessment.

- (5) Resource optimization is perhaps the single most challenging to implement, of all the measures listed, more so because all other measures require resources of some sort. A first approach in tackling this intractable problem is the development and roll out of a regional sustainable financial mechanism in support of ESIM programs.

Resource optimization in the first instance considers closing the knowledge and personnel gaps which are serious handicaps in the region. A concerted effort must be made to have more highly trained and competent personnel in sensitive technical and advisory positions. In the second instance, a more coherent approach to ESIM in the region will bring to the fore the role and importance of such mechanisms, and will act as an enabler in plugging the gap for the inadequacy of dedicated energy trained personnel as observed during the data collection phase of this research. Third, the procurement of services, support equipment, and region-friendly ESIM tools remains an enabling imperative for any program in the region.

The research highlights a variety of ways to redesign and strengthen the foundation of sustainable energy development at both the state and regional levels. This is best accomplished by adopting contemporary ESIM techniques and applications supported with a smart mix of appropriate governance approaches. Here ESIM, an embodiment of energy data, information systems, and capacity building can advance new ideas, insights and options, as well as present the basis for long-term sustainable development in the energy sectors of the respective member states. This must also be complemented by data transparency, technology enhancement, and skilled energy professionals. However, success is highly unlikely if the region continues a business as usual path and the adoption of narrowly construed interpretations of what is involved in national energy management, and its role in regional sustainable development.

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