



## Reflections on experience with the global network on energy for sustainable development as a South–South global knowledge network



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### ABSTRACT

The Global Network on Energy for Sustainable Development (GNESD) was an initiative launched at the 2002 World Summit on Sustainable Development to support the agenda for increased access to clean energy, as a key contribution to sustainable development. In addition to understanding how the Network was established, how it sustained its relations and organised its activities across borders, we contribute to the debate on global networks by introducing the concept of ‘outcomes’, as a means to understand the extent to which, and how, the Network was able to influence change within the participating countries. We conclude from the analysis that although there are numerous observable and verifiable outcomes, these were achieved in a rather unsystematic manner especially during the early years, and in a more structured and targeted manner during the last 5 years of the Network. To a great extent this reflects the output-focus that was prevalent within UNEP, and other similar organisations, at the time the Network was established. It also reflects the well-known structural challenge faced by many epistemic communities, where the extent of their influence reflects the extent to which they are embedded within evolving power structures. Finally, we offer a number of specific recommendations for future networks, based on the GNESD experience.

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### Introduction

The Global Network on Energy for Sustainable Development (GNESD) was launched at the 2002 World Summit on Sustainable Development in Johannesburg, building on one of the recommendations from the UN Commission on Sustainable Development in 2001. The Network was operational for 13 years, making it one of the longest running initiatives from the Summit. Funding, totalling approximately EUR 7 million, originated from various EU donors, principally Germany and Denmark, with smaller contributions from France and the UK. Funds were usually granted in one or two year tranches, so long-term planning was inherently subject to uncertainty.

While the GNESD secretariat was managed for UNEP by the UNEP DTU Partnership (UDP) in Denmark, the members were southern research centres from across Africa, Asia and Latin America.<sup>1</sup> A group of northern based research centres were originally affiliated, but it quickly became clear that funding for these partners was hard to find and so the

Network turned into a South–South structure. At the outset GNESD’s two long-term objectives were articulated as (GNESD, 2002):

1. Enhance national institutional capacities to develop policy and undertake planning and research efforts that integrate solutions to energy, environment and development problems
2. Reduce pollution from energy activities, while allowing developing countries to meet growing needs for energy services

Those objectives were translated into five ‘short-term results’, expressed in the GNESD Project Document (GNESD, 2002) as:

1. A general strengthening of Network partners’ ability to acquire, assimilate and apply existing knowledge and experiences
2. Improved understanding of the links between sustainable energy and other development and environment priorities, and technology and policy options, leading to better articulation of practical policies that can be adopted so as to promote energy for sustainable development
3. Changes in government policies and programmes, and private sector investments, so that these favour energy for sustainable development approaches
4. A communication infrastructure that provides a means for partners to share experiences and draw on each other’s strengths, expertise, and skills, and

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<sup>1</sup> AFREPREN/FWD (Kenya), ENDA (Senegal), ERC (South Africa), MEDREC (Tunisia), TERI (India), AIT (Thailand), ERI (China), the Bariloche Foundation (Argentina), GBIO/UPRJ (Brazil) were the core group. During the early years the American University in Beirut and the University of South Pacific on Fiji were also members, while the Mario Molina Centre (Mexico) joined in the latter years of GNESD.

5. Strengthened South–South and North–South exchange of knowledge and collaboration on energy issues of common interest.

It is worth noting the use of the word ‘result’ was not fully defined in the original project document, though we understand it to mean an observable, verifiable, change in capacities and/or behaviour. As such, we replace ‘result’ with the word ‘outcome’, which we define and discuss in section 4. For the sake of documenting the key outcomes of the GNESD work, we focus our analysis primarily on the two related results #2 and, particularly, #3. The other three “short-term results”, which are largely output-based and related to capacity development, were deemed to have been achieved when assessed in a mid-term review by an independent consultant (Mann, 2010), and in self-assessments conducted by the Member Centres and the GNESD Secretariat in reports to the main donor agency (Ackom, 2013).

### Structure and operation of GNESD

The GNESD Member Centres operated at national and regional levels, conducting research, analysis and outreach on various themes that were identified through stakeholder consultations, input by Member Centres themselves, and eventually agreed within the Network as a whole. The Network has a Steering Committee, co-chaired by two eminent energy experts,<sup>2</sup> and supported and facilitated on behalf of UNEP by the GNESD Secretariat at UDP.

GNESD studies were, in principle, coordinated on a rotating basis, by different Member Centres. UDP was responsible for fund management and overall delivery of the programme. The activities were driven by empirical research aimed at providing recommendations on practice and policy to support governments and intergovernmental organisations in their efforts to increase access to energy that would contribute to sustainable development, with a focus on “cleaner” or renewable energy. This led to more than 100 technical reports and ‘grey literature’ published across various themes, including biofuels, urban and peri-urban energy, bioenergy, energy security, renewable energy technologies, energy access and the ‘Energy Plus’ concept. All of this material was made publically available on the GNESD website and formed the core outputs of the network.

GNESD also conducted work that can be labelled ‘knowledge management, communications and uptake’. This included implementing a process of Policy Dialogue Fora (PDF) in the engaged countries with the aim of establishing direct communication with policy makers. The PDFs were introduced in 2011 following a mid-term evaluation of the network, with the aim of providing a structured mechanism to facilitate the uptake of GNESD findings into energy policy making and reform processes.

More generally, GNESD provided a common platform for South–South knowledge exchange and collaboration regarding the analysis of barriers, as well as ‘best practises’ on environmentally benign energy for sustainable development. This was manifested in the GNESD Energy Access Knowledge Base, as a South–South portal for sharing information on energy access policy and technology.

### Characterising GNESD as an epistemic community

There is wide agreement within the relevant literature that the role of transnational and global networks has become increasingly important within the realm of public policymaking (Betsill and Bulkeley, 2004; Reinicke and Deng, 2000; Haas, 1992; Stone, 2002). The global character of many contemporary societal challenges necessitates transnational, and even global, coordination of policies in order to effectively address the root causes of these challenges. As such, the uncertainties and complexities of these challenges have been met with novel and

increasingly complex means to understand and address them (Haas, 1992). A proliferation of transnational networks has emerged since the turn of the millennium, partly in response to this need for more complex ways of dealing with global issues, such as climate change. Moreover, there has been a corresponding change from seeing national, hierarchical structures as the core of policymaking, towards international and networked forms of governance (Betsill and Bulkeley, 2004). These networks can be composed of different types of actors ranging from public entities to corporations, NGOs, academics and civil society groups. In general, there is an appreciation that networked collaborations can achieve more than what individual members can, working alone. Hence, networks have the potential to become greater than the sum of their parts.

One of the key characteristics of transnational networks is their role as vehicles for knowledge assimilation, accumulation, generation and dissemination (Stone, 2003). Furthermore, to varying degrees depending on the type of network, knowledge can be used to influence policymaking by providing more detailed information on a particular policy issue, by changing the ideas and opinions of policymakers on particular issues or by changing the overall perception of what the policy issue actually is. Consequently, the possession and control of knowledge within these networks can eventually lead to changed behaviour in some target group (e.g. policymakers) through the coordinated dissemination of new ideas and information (Haas, 1992). As such, all networks share the idea that knowledge is integral to the policy process, which links directly to the third intended outcome of GNESD, as mentioned above.

The academic literature identifies various types of transnational networks, and it is not always the access to and possession of knowledge that attracts actors to become members of transnational networks. In some cases, transnational networks acquire the authority to not only influence policymaking, but to actually engage in public policy regulation and thus turn into “global public policy networks” (Reinicke and Deng, 2000; Stone, 2003). In a study of the Cities for Climate Protection programme it was found that members were mobilised from the political and financial resources offered from the programme rather than the access to information per se (Betsill and Bulkeley, 2004). Members of global public policy networks tend to be highly involved in policymaking processes, at mostly national level, and engage in these networks to pursue their own material interests (Stone, 2003).

Another type of network is the “transnational advocacy network”, which differs from global public policy networks in being dislocated from the central processes of policymaking (Stone, 2002). Nevertheless, they often tend to share the same strong normative position to a specific policy issue and apply their shared interest, knowledge and resources to vie for a change in the global public discourse on the matter (Keck and Sikkink, 1998). These networks are often composed of NGOs and activists and place great emphasis on the processes of networking, in addition to the actual policy lobbying and, thus, differ from global public policy networks.

While the two previous types of networks aim to pursue a certain normative agenda, “global knowledge networks” differ by being rather detached from any subjective views and tend to treat knowledge objectively and rationally (Stone, 2003). As such, these networks are not politically motivated, but are often composed of academics, scientists, professionals and researchers who gather around a particular matter or issue, to which they can apply expert knowledge, often with a strong advocacy and policy focus (Nascimbeni, 2013; Stone, 2002).

Furthermore, members have a common understanding of how to approach this matter through coordinated research, study, intellectual exchange and result dissemination (Stone, 2002). Global knowledge networks tend to occupy a more marginal position in policy making processes, due to their more ‘academic’ profile and political neutrality. As a result, these networks can indirectly influence policymaking by changing the knowledge base of policymakers and other key stakeholders through such activities as exemplifying policies and lessons

<sup>2</sup> Professor Thomas B. Johansson, Lund University, Sweden and Professor Ogunlade Davidson, University of Sierra Leone.

learned from other contexts. Policymakers often turn to global knowledge networks for advice in situations of high uncertainty and insufficient information regarding how to deal with new and untried policy issues and challenges.

One conventional type of global knowledge network is the “*epistemic community*”, which shares all the above characteristics, but differs from other types of global knowledge networks in being very firm on objectivity and rationalism. On the other hand, “*discourse coalitions*” are to a greater degree influenced by discourse and subjectivity while “*embedded knowledge networks*” assign importance to the role of material interests as the source of influence (Stone, 2003). We argue, based on this understanding, that GNESD is best characterised as an epistemic community.

Regardless of how we label specific global knowledge networks, their influence on policymaking is related to the general debate on how knowledge transforms into ideas and subsequent changes in behaviour, which is the ultimate concern of outcome mapping (see section 4). Some see ‘policy learning’ as a naturally evolving linear process where, in principle, better information leads to better policies (Betsill and Bulkeley, 2004). Alternatively, the process can fundamentally change the way in which a given policy issue is being approached and provide for a reinterpretation of the very nature of the policy issue. Also, generally speaking, despite their seemingly neutral standpoints, the knowledge and ideas promoted by global knowledge networks cannot be entirely separated from the social contexts within which they are generated (Stone, 2002, 2009). This is of fundamental significance for a network such as GNESD, which operated ‘South–South’, i.e. across continents, in diverse settings.

Global knowledge networks operate in complex settings involving various actors and stakeholders, and are thus exposed to many different views and interests, potentially affecting the final outcomes, whether in terms of policy change or simply with regard to how knowledge is created. As such, it is fair to question whether the transfer of successful policies from one context to another is universally feasible as the idea of one-size-fits-all might not apply (Stiglitz, 2000), even if the transfer is ‘South–South’.

For policymaking, the process can be seen as one where ideas and interests are two separate entities, i.e. where knowledge is sometimes sought to be used to support existing interests, instead of generating new ideas in support of a radical or reform agenda. This has led some commentators to question whether transnational networks can ever effectively influence policymaking (Betsill and Bulkeley, 2004; Stone, 2003), unless they generate ideas and arguments that serve to legitimise or otherwise endorse powerful and/or vested interests, in which case their ideas are not used to affect change, rather to maintain the status quo. Even in cases where policy issues are of a highly technical nature, the resulting policy decisions are affected by a general weighing of the pros and cons for different groups of society, thus putting less emphasis on the objective and scientific advice from experts on the matter (Stone, 2001).

In this perspective, policymaking can be viewed as the product of a battle of ideas that operate in the service of interests, and where knowledge is the weapon (Stone, 2001). Nevertheless, concerning epistemic communities, there seems to be some evidence that these can influence national and international policymaking by occupying specific niches in advisory and regulatory bodies (Haas, 1992). When reflecting on GNESD, we are curious to understand to what extent, and how, the network members came to occupy these niches. The success of this influence depends on any given community’s ability to use its expert knowledge to gain and exercise bureaucratic power in relevant contexts. In dealing with epistemic communities, Haas (1992) outlines how the achievement of these networks can be investigated from mapping the members of the community and their shared principles and beliefs, studying their activities and demonstrating their influence on policymakers. In analysing GNESD, we go a step further in documenting the main outcomes, reflecting on 13 years of experience.

## Focusing on ‘outcomes’

In this article we are primarily concerned with understanding the ‘outcomes’ of GNESD, as opposed to ‘impacts’. This is an important distinction that enables us to better understand the chain of causation and attribution, and the consequences this has for proper accountability. Indeed, outcome mapping methodologies, first pioneered by the Canada-based International Development Research Centre (IDRC) in the early 2000s (Earl et al., 2001), have become increasingly mainstream, especially in the international development sector. In recent years, the motivation for documenting outcomes reflects greater political pressure for development agencies to justify their work, explaining to tax payers what difference they make.

In analysing outcomes, the most basic point is that outputs, outcomes and impacts should be seen as results at different levels. Outputs are usually defined as the immediate products of an individual’s or an organisation’s activities, i.e. the processes, goods and services produced (OECD, 2002). These can include, for example, workshops, training manuals, research and assessment reports, journal articles, books, guidelines and action plans, strategies, and technical assistance packages (Wilson-Grau, 2008). In other words, ‘outputs’ are within almost total control of the project managers, or network members in the case of GNESD.

After the level of outputs comes ‘outcomes’, which, in the context of development assistance, the OECD defines as “the observable behavioural, institutional and societal changes...usually as the result of coordinated short-term investments in individual and organizational capacity building for key development stakeholders” (OECD, 2002). In other words, this is the intermediate level of observable positive or negative change in the actions of the specific social actors that “have been influenced, directly or indirectly, partially or totally, intentionally or not, by (a project’s) activities...” (Wilson-Grau, 2008).

We move even further away from the sphere of influence when talking about ‘impacts’. Impacts concern the broader, often implicit, objectives of a given programme or project. In the context of scientific research into the causes and effects of energy poverty, the objectives are usually to help achieve long-term, sustainable changes that aim to increase human welfare, reduce pollution and conserve natural resources. As such, it is unreasonable to assume that any single programme or project can do more than contribute, partially and indirectly, to these ‘bigger picture’ impacts. While these distinctions and processes may appear obvious or common sense, it has been noted that project managers and stakeholders often confuse the terms output/outcome/impact, when questioned about them (Haselip et al., 2014, 2015).

## Understanding GNESD’s mechanisms of influence

The Member Centres of GNESD were engaged on the basis of their position as acknowledged scholars, researchers and/or institutions within the field of sustainable energy, in their respective regions. At the outset the aim was to have regional “centres of excellence” in the major developing regions and countries: China, India, Brazil and South Africa.

The portfolio of GNESD publications is evidence of the network’s success in designing and conducting research and evidence-based policy recommendations, targeted at relevant stakeholders. These outputs led to various outcomes which were achieved in both direct and indirect ways, summarised in this section.

One direct way that GNESD has been able to influence policy changes and reforms is through the involvement of its Members in the development of regional, national or local policies on energy and energy access. In their capacity as experts on the topic, Members were invited by policymakers to provide advice on draft policies and as well as strategies, targets, evaluations etc. In this process, findings emerging from GNESD studies complemented the existing knowledge of Member Centres or served as direct inspiration for the inclusion of specific measures



or initiatives in policies and reforms. In some cases, Members provided support in the development of policies on other subjects such as poverty reduction where the aspect of energy could play a decisive role. In other cases, GNESD Member Centres chaired task force groups, as in the case of Kenya's Performance Contracting for the Energy Sector (2006–2011) where the introduction of energy-access targets as part of performance contracts for the Rural Electrification Agency was facilitated by earlier GNESD study findings. Knowledge acquired from GNESD was used both for specific policy formulations as well as for on-going technical advice over a number of years on particular topics, which subsequently fed into reforms.

A more indirect way of influencing policymaking and reforms was through the dissemination of study reports and findings during workshops where key stakeholders from different sectors participated. GNESD studies often formed the basis of focused workshops or, alternatively, for Members to introduce findings in workshops where they were invited to participate as experts. The interaction with key decision makers in these workshops served as a means to share new ideas and experience. In some cases the direct implementation of advice led to observable changes such as the increased penetration of Liquefied Petroleum Gas (LPG) for cooking in India. In many cases the implementation of recommendations led to requests for additional support, thereby indicating an appreciation for the advice received.

An example of the role that GNESD network played in feeding into major policy reforms, over a considerable period of time, is the National Plan "Luz para Todos" (Light for All) in Brazil. The plan was adopted by the government from 2003 to 2010 and challenged utilities to grant electricity access to all Brazilian households. The plan connected 3.2 million households to the grid, providing almost 100% and 75% connectivity for urban and rural areas, respectively. Coinciding with the roll-out of the plan, the Brazilian Member Centre of GNESD took part in GNESD-funded studies into energy access, affordability, technology deployment, pro-poor tariffs as well as educational and health benefits of modern energy access. The ongoing interaction of Member Centre staff with the Ministry of Energy and Mines, in workshops and the resulting exchange of research results, were identified by stakeholders as a 'valuable inspiration' for the design and formulation of the "Luz para Todos" plan.

Another indirect way GNESD managed to influence policymaking was by creating awareness around particular issues that were previously less emphasised by policymakers and key stakeholders. Moreover, not only were unnoticed issues brought to the fore of policy agendas, but also the way in which already prominent issues were approached could be changed by creating awareness of certain elements of the issue. The process of creating awareness was achieved by GNESD at various levels, ranging from the regional level to the national and local political level, and even in some cases among local communities and settlements where knowledge of energy access is less pronounced.

One particular issue that GNESD Member Centres managed to influence was the understanding of the complexity of urban energy access, which was highlighted by several of the Member Centres as being successful in influencing policymakers. Previously, policymakers had placed more emphasis on energy access for rural communities, but following the GNESD study on urban and peri-urban energy access, the need to deal with energy access for the urban poor was ascribed much greater importance. The studies also provided new insights, for example, on the importance of entitlement to land occupation by house owners as the key barrier to electrification, and how neighbour connections were quite widespread in some countries, both where the practice is illegal and where it is fully accepted.

The PDFs, first held in 2011, enabled early interaction with key stakeholders, involving them in GNESD studies both before and during the actual study process in order to get their inputs. Through this involvement, key stakeholders would take part the actual formulation of policy recommendations, with the result that these recommendations would be more likely to be adopted by policymakers. Although the

potential involvement of policymakers in these PDFs would have been a great contribution and endorsement of Member Centres' work, it was mainly stakeholders such as energy service providers and utilities. In a few cases such as Thailand, extensive engagement with policymakers at both national and municipal levels was achieved via the fora. Nonetheless, the introduction of the PDFs towards the latter part of GNESD's operations is considered to have achieved better outcomes and raised greater awareness among policymakers compared with the earlier pre-PDF period. Some of these outcomes are discussed in the following section.

In general, the GNESD network served as a vehicle for benchmarking policies, reforms, techniques and efforts across countries and regions. GNESD studies created awareness of the successes and failures of various policies and programmes for Energy for Sustainable Development, in different contexts. In addition to the studies, GNESD Member Centres used the network to continuously share with each other experience that could feed into their daily work and interaction with policymakers. For the Members operating across a number of countries in a region, the value of having comparable experience and information was particularly useful in giving policy advice. In other cases, such as India, the GNESD Member Centre benefitted from earlier studies on mini-grids conducted in the 1990s, which had contributed to the design of mini-grids for rural electrification. These lessons and recommendations were adopted by the Government of India and included setting tariffs for electrify supplied to remote rural villages, through mini-grids.

There were other and additional ways in which the GNESD network had an influence, but which did not apply to all of the GNESD Member Centres. For instance, the Member covering East Africa involved key stakeholders as part of the study team for power-sector reforms, which subsequently led the stakeholder to adopt the study's recommendations.

Another example of influence, facilitated by the work of GNESD, is the Member covering Southern Africa who collaborated with a partner from the private sector, leading to improved energy access in informal settlements in Cape Town, South Africa. The pilot project involved disseminating LPG, which attracted interest from key national stakeholders in South Africa. Moreover, stakeholders from Zimbabwe travelled to Cape Town to learn how to emulate the project. This example illustrates how partnerships with private-sector entities can potentially be used as vehicles for influencing policymakers, through hands-on projects.

Finally, GNESD was able to support capacity building within the Centres, which in turn helped them to sustain their work on energy for sustainable development. For instance, the results of GNESD studies, and the experience of conducting them, led some Member Centres to apply this knowledge in other settings such as the Sustainable Energy for All initiative led by the executives of the United Nations and the World Bank. This reveals a longer chain of influence, beyond GNESD itself, combining with other initiatives to deliver a more complex and convoluted set of outcomes to which no one network or project can claim sole responsibility for.

Other types of capacity building reported by Member Centres include making them aware of certain issues that were later adopted as focal areas of the Centre, improving methodological approaches to research and analysis and creating or joining similar networks within other fields, based upon the GNESD model. Moreover, some GNESD Centres worked in their capacity as educational institutions to educate graduate students who later achieved employment with government agencies and who had been exposed to work, processes and conclusions of the GNESD studies.

## Outcomes from GNESD

In this section we summarise some of the specific, observable, outcomes of GNESD in terms of influencing policies in support of energy for sustainable development. These outcomes were verified by

stakeholders<sup>3</sup> interviewed for the study in late 2015. Although some short and long-term results were defined in the original project document, no intended outcomes were defined, making it difficult to assess observed change against a relevant baseline. As such, the positive outcomes of GNESD have been, to some degree, been incidental. The outcomes are grouped by sub-regions namely West Africa, Southern Africa, East Africa, Latin America, and Asia.

#### West Africa

ECOWAS<sup>3</sup> invited ENDA to review its draft energy policies in preparation of the ECOWAS Energy White Paper (2006). This led to key recommendations of the GNESD studies into power-sector reforms (2004), energy access (2004) and renewable energy (2005) being reflected in the final policy document. This included a focus on energy for productive use, which was an issue and agenda item introduced by GNESD. Similarly, recommendations made by ENDA on the role of renewable energy for poverty alleviation and job creation were reflected in the Poverty Reduction Strategy Papers (PRSPs) of UEMOA<sup>4</sup> Member States in 2007.

In Senegal, the Rural Electrification Agency (REA) took part in GNESD workshops and consultations, particularly on the renewable energy thematic studies in 2005 where the integration of renewable energy in rural electrification was presented and discussed. GNESD studies provided benchmarking techniques and analysis of the evolution of renewable energy solutions in Africa and other regions, which the REA has adopted as part of its rural electrification agenda.

Findings and recommendations from GNESD studies, particularly those on bioenergy (GNESD, 2010; Ackom et al., 2011), were also incorporated into the SE4ALL Rapid Gap Analysis reports, and prepared for UEMOA Member States including Burkina Faso, Guinea, Niger and Togo. Similarly, the studies on urban and peri-urban energy access (GNESD, 2008a, 2008b, 2014a) were referenced in key policy documents in the region and this previously-neglected issue area has become a focus of concern for ENDA.

#### Southern Africa

For the Southern Africa region, the Energy Research Centre (ERC) at the University of Cape Town was involved in almost all the thematic studies under GNESD. In recent years ERC has created awareness among the informal settlements of Cape Town regarding the use of clean energy, particularly shifting from paraffin to LPG for cooking, which was the focus of the final urban poverty and energy access (UPEA III) study. As a result of that study, ERC collaborated with KayaGas, to roll out LPG technology in informal settlements on the outskirts of Cape Town, such as Imizamo Yethu (GNESD, 2014b; Singh et al., 2015a, 2015b). The LPG model developed in this collaboration has attracted attention from the Department of Energy and Eskom (the state-owned electricity utility), with a view to scaling up the technology implementation elsewhere in South Africa (GNESD, 2016).

Using GNESD as their platform, ERC staff also participated in the development of the Cape Town Household Energy Strategy by attending workshops and contributing expert opinion to the formulation of the strategy, including the definition of objectives, activities and the prioritisation of strategy elements.

#### East Africa

The GNESD network member for East Africa was the African Energy Policy Research Network (AFREPREN), which, between 2003 and 2005,

participated in the formulation of the Kenyan National Energy Policy of 2004 (later revised and adopted in 2012) and the current Energy Act, which was passed into law in 2006. Interviewees at the Kenyan Ministry of Energy and Petroleum (MoEP) indicated that the results of the GNESD studies on power-sector reform, energy access and renewable energy were a useful resource that AFREPREN was able to share in the formulation of both the Policy and the Act (GNESD, 2016).

In its capacity as chair of the Government of Kenya's Inter-Ministerial Task Force on Performance Contracting for the Energy Sector (2006–2011) AFREPREN presented GNESD study findings and recommendations. These included the introduction of energy access (electrification) targets in the performance contracts for the Rural Electrification Agency (REA) and publication of feed-in tariffs, particularly for the bioenergy sector, in contracts signed with the MoEP and Energy Regulatory Commission (ERC). Indeed, REA's decision to introduce targets for energy access came directly from the findings of the 2004 GNESD study on power-sector reforms.

AFREPREN was also involved in the performance evaluation of the MoEP's targets. In that evaluation, AFREPREN assisted the Ministry in revising its Power Sector Expansion Planning targets, which were used to renegotiate performance contracts for the following years. Elsewhere in the East Africa region, AFREPREN drew upon its work with GNESD to provide advice and feedback on the draft Renewable Energy Policy for Uganda (2007) and on feed in tariffs for the Tanzanian Energy and Water Regulatory Authority (GNESD, 2016).

#### Latin America

Within the Latin America region, the Bariloche Foundation used GNESD as a platform to advocate a greater role for government and non-government stakeholders in the design of power sector policies. This built upon the conclusions of their GNESD-funded analysis concerning the energy market failures experienced in many Latin American countries, especially with regard to energy access and the equitable distribution of the economic benefits of privatisation. Following these publications, the Bariloche Foundation was commissioned by various governments in the region, including Honduras, Bolivia, Ecuador, Paraguay and Venezuela to provide technical assistance on the topic of energy sector reforms.

In Brazil, where COPPE/CENBIO concentrated their GNESD activities, the most notable outcome of the network's activities was its involvement in the national Luz para Todos (Light for All) programme, which ran for seven years from 2003 with the aim of achieving universal electricity access in all Brazilian households. The Light for All programme created a regulatory framework that obliged utilities (both public and privately owned) to achieve universal electricity access in least-cost ways, to deliver on their electrification targets and coverage, within stated deadlines. The energy regulator also created cross-subsidy tariffs for the benefit of low-income consumers, which was something advocated in GNESD studies on power-sector reform. To date, this programme has connected 3.2 million rural households (15.6 million people) to the grid, with national urban connectivity at almost 100%, and over 75% in rural areas.

Coinciding with the Light for All programme, COPPE/CENBIO conducted access studies that analysed the concepts of access, affordability and technology deployment for grid-based supply in urban, peri-urban and some rural areas and diesel powered mini-grids and/or solar PV for more isolated communities (GNESD, 2014c). Although it is difficult to verify, the conclusions of these studies are likely to have filtered into the policy formulations and regulatory framework for Light for All, given that COPPE/CENBIO was being consulted by the Brazilian Ministry of Mines and Energy, and exchanged research information in workshops with government officials.

In 2012, Brazil established a regulatory framework for decentralised power, through mainly solar PV for home and commercial systems. The analysis of PV deployment had earlier been completed through GNESD

<sup>3</sup> The Economic Community of West African States, a regional group of sixteen countries, founded in 1975.

<sup>4</sup> West African Economic and Monetary Union.

(2005–2007) by COPPE/CENBIO, and shared with government and other stakeholders in workshops and through interaction with their contacts in the Ministry of Mines and Energy. Over the 13 years of GNESD's lifetime, COPPE/CENBIO trained and deployed numerous graduate students that went on to work in government energy planning and policy making agencies, indicating an important indirect mechanism through which influence can be achieved.

### Asia

In India, TERI promoted energy for sustainable development through GNESD, leading to numerous verifiable outcomes. During UPEA Phase II and Phase III (2008–2013), TERI formulated policy recommendations to increase energy access among low-income urban populations, which were shared through two GNESD Policy Dialogue Fora (GNESD, 2008b, 2014d). The dissemination of the conclusions and recommendations of UPEA II and III contributed to the decision by the New Delhi authorities to ban the use of kerosene. To achieve that transition, the local government introduced a subsidy scheme that enables the urban poor to switch from using kerosene for cooking to LPG, which is a far cleaner and safer fuel, including the distribution of LPG stoves and smaller gas cylinders (4–5 kg) (Singh et al., 2015a, 2015b; GNESD, 2016). These specific measures were discussed at the GNESD Policy Dialogue Forum in 2011.

Another significant contribution of GNESD to policy change in India resulted from the mini-grids study, an issue that TERI has been working on since the 1990s. The federal government of India has now decided that power should be provided to remote unconnected villages through mini-grids, as a stepping stone to grid-based electrification. This decision reflects a TERI recommendation, based on the GNESD mini-grids study, that includes details on how tariffs should be set. The first GNESD contact person at TERI (2003–2011) indicated that she participated in India's 5 year energy planning process, contributing to the working group's decisions on renewable energy and distributed generation, thus revealing a key indirect mechanism of influence for GNESD's work (GNESD, 2016).

The other Asian GNESD Member Centre was the Asian Institute for Technology (AIT), based in Bangkok, Thailand. Their work increased awareness on the need to address energy access for the urban and peri-urban poor, and the workshops and results organised around this issue were cited by government sources in Thailand as being influential in policy formulation. In general, through other GNESD studies, AIT indicated that greater awareness had been created on the successes and failures of different policies and programmes for sustainable energy, and that experience-sharing from other regions was of particular interest and practical use.

### Discussion

In reflecting on the outcomes discussed in the previous section, we can ask “to what extent did GNESD inform public policy making and business planning on energy for sustainable development?” Here, it is widely acknowledged that the main challenge is to apply technical knowledge into policy and business planning. But what do we know about the barriers and constraints to such uptake? How can these be removed? How, and to what extent, did network Member Centres interact with policy-makers? Did the ‘target audience’ adopt the research findings as evidence that could support their policy formulation or revision? How can we ascertain whether they did so or not? If they did not embrace the research findings, what was the reason?

When research or knowledge networks refer to an ‘interaction with policymakers’, the precise mechanism through which research outputs actually influence policy or practice is rarely explained in any detail. As such, efforts to engage with and influence policymakers are mostly ad hoc at best, and amount to little more than a hope or expectation that the research findings will be accessed, understood and taken up by

the relevant actors in government or the private sector. The evidence gathered from the Member Centres suggests that GNESD, conceived as a largely output-based knowledge network, largely conformed to this experience. In turn, the lack of explicit, guiding, mechanisms or *theories of change* undermines efforts to reflect upon the functioning of research networks such as GNESD, or face the hard question of what difference its efforts made. Finally, GNESD was not unique in its lack of systematic follow-up studies to monitor longer-term outcomes, which once again reflects the predominant focus on monitoring, reporting and evaluating the strength of the network's *outputs*.

Following from the discussion of output-to-impacts in section four, there are inherent challenges to assessing the extent to which any network is able to influence policy directly. To a large extent this is because networks do not operate in a vacuum and are effectively competing with the advice and interest provided by other networks and stakeholders, potentially with different agendas. Furthermore, the nature of policy making processes makes it difficult to track changes, as there may be a significant time lag between outputs and outcomes. Above all, it will always be an open question whether the identified policy change or decision would have come about in the absence of the network or GNESD Member Centre engagement.

In the 2015 outcome study conducted by GNESD, some Member Centres were of the opinion that the aim of sharing policy experience from other countries and regions was unlikely to make a significant difference, as there can be no “one-size-fits-all” model for context-specific issues. They further believed that, given limited resources, a key option to influence policymakers was through the dissemination of knowledge where non-academic outputs are more likely to be understood and acted upon.

With regard to the cooperation between GNESD Member Centres, there was general agreement among Centres that it served as a relevant network for sharing best practises. For example, practises and ideas taken from other contexts were often better received than the ones based on local studies, thus highlighting the value of South–South knowledge exchange. Indeed, the cooperation between Centres was sustained in other aspects, outside the context of GNESD, though work carried out under the auspices of GNESD served as the initial starting point. Many have also referred to the membership of GNESD as a stamp of local credibility and sometimes as a “door opener” to engagement in processes that the Centres would otherwise not have been part of.

As previously explained the thematic studies were mostly coordinated by Member Centres themselves, often in turns and based on their strength in the subject matter. This was appreciated by the Member Centres, as it contributed to strengthening cooperation between them and a sense of ownership over the network. It was also seen as a real asset in documenting capacity to manage projects and processes, and several centres have requested documentation specifically on this function as a reference. While working together within the network, GNESD Member Centres likewise cooperated with other non-GNESD partners in trying to influence policy making. It was generally acknowledged by Members that this cooperation with external partners - typically within the region where the Centre was operating - could have been pursued to a greater extent to achieve wider dissemination of research results, and to maximise the effect of policy recommendations. This further supports the argument that the work and advice of Member Centres did not operate isolation.

Time and budget constraints were considered to be the main barriers to strengthening external partnerships, required to engage policymakers systematically. Overall, the GNESD Member Centres agreed that the network added value to their work and profiles, especially in dealing with both external partners and policymakers. As such, not only did the work carried out in relation to GNESD built capacity with the Centres, but this capacity has also been acknowledged by external stakeholders, over the years of their involvement in the network of GNESD.



## Conclusion and recommendations

The policymaking process can be seen as one in which ideas and interests operate as two separate entities, i.e. where knowledge can be sought and used to support existing interests, or to generate new ideas in support of a reformist agenda. In this regard, GNESD often generated ideas and conclusions that questioned the predominantly market-driven policy agendas of energy ministries and the International Finance Institutions operating in developing countries. Indeed, there does seem to be evidence that the early power-reform studies (GNESD, 2004) did affect thinking about institutional reforms and the effect that these were claimed to have on access improvements. On this point, the scope of GNESD's studies, defined partly by the Member Centres themselves, were largely challenging the market model, or at least focusing on the market failures, for example the persistent challenge of increasing access to modern, cleaner, energy technologies in low-income urban and peri-urban communities. In this sense, GNESD faced 'access challenges' similar to those experienced by many epistemic communities operating as global knowledge networks, as opposed to networks operating in support of a clear set of interests, corporate or otherwise, that tend to be highly embedded within the structures of bureaucratic power.

It is also worth noting that much changed over the lifetime of GNESD, not just in terms of energy markets, technologies and the political priorities at both national and international fora, but also in the way that information is created and shared. 'Social media' did not exist when the network was designed and set up and its methods of knowledge creation, communication and dissemination did not change significantly throughout the lifetime of GNESD. Related to this is the fact that observers and stakeholders often attribute identified outcomes to individuals and/or their organisations, especially 'big name' actors, as opposed to the network or project that funded their work and/or gave them a platform to communicate their work. In reflecting on GNESD, we identify the following recommendations to the designers and operators of similar global research and policy advocacy networks:

- Incorporate a clear theory of change, with a view to achieving specific outcomes, from the start
- Pursue active outreach and communication, such as GNESD's Policy Dialogue Fora, to shift from a passive output-based model towards a more proactive voice, communicating simple messages to a target audience
- Define a clear niche, accompanied by strong network 'branding'. This is increasingly important in an information-rich environment where most sectors are populated by similar, often competing, knowledge networks
- Involve stakeholders, including policy makers, in the scoping as well as conduct of specific studies so as to secure higher levels of 'buy-in', which in-turn increases the likelihood that findings and recommendations are acted upon, leading to observable change
- Design a monitoring and evaluation framework, ideally supported by some baseline data, so as to better understand and document outcomes

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