

Introduction

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This Special Issue on power sector reform and its impact on the poor is comprised of articles prepared by institutions in the Global Network on Energy for Sustainable Development (GNESD). The GNESD, created in 2000 at the World Summit on Sustainable Development (WSSD)¹, promotes sustainable development through policies and solutions that expand the poor's access to sound energy services. The articles are based on a study undertaken by GNESD's "Energy Access" Working Group, which has been assessing the impact of reforms on the poor in the developing regions and determining what approaches are more successful in safeguarding their access to energy.

1.0 Scope and Structure of the Issue

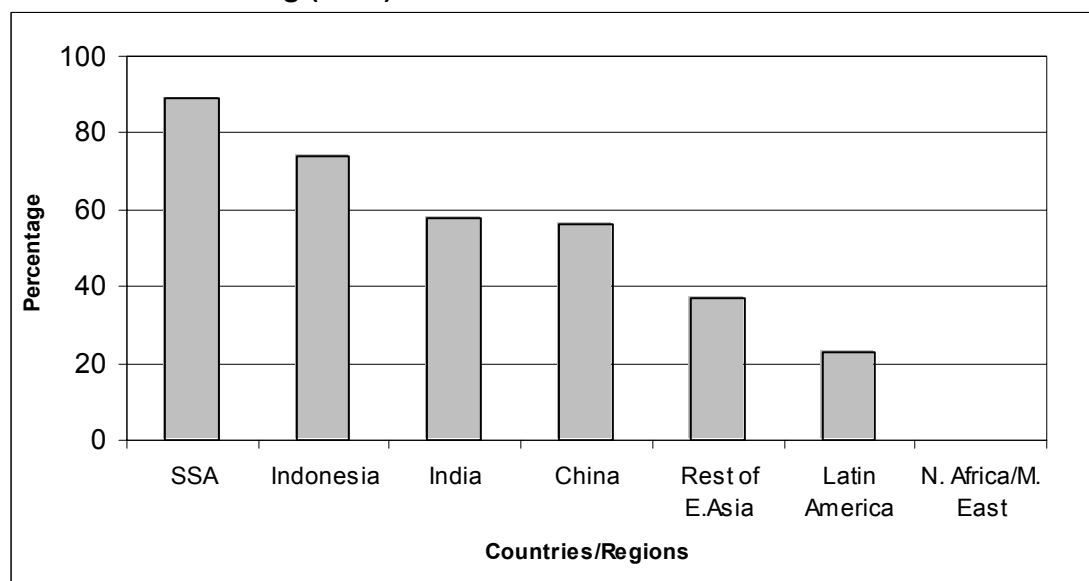
About 2.7 billion people or close to half of the world's population is estimated to survive on less than US\$2.00 per day²– the "poor" as defined by international agencies such as the World Bank, IEA, UNDP, UNEP and OECD (Ravallion, 2004). A key distinguishing feature of the world's poor is inadequate access to cleaner energy services (figure 1). The majority of those earning less than US\$ 2.00 per day (an estimated 2.4 billion people) rely on traditional biofuels to meet the bulk of their energy needs (GNESD, 2003a; WEC, undated).

¹ WSSD is commonly referred to as Johannesburg Summit.

² For some countries, US\$2.00 per day may represent a relatively high income. For example, in Argentina, a family that currently receives US\$240 per month (based on 4 persons each receiving US\$2.00/day) is not a poor family (Bouille, 2002). This is also true of many sub-Saharan African countries where well over 90% of the population survives on less than US\$2/day.

It is important to note that there is an emerging debate on the validity of the method used to estimate the poverty threshold by the World Bank and other international agencies (i.e using household surveys). Critics of this technique claim that the poverty levels it depicts appear to be higher than likely reality and they suggest the use of national accounts data as a more appropriate method of estimating poverty levels (Ravallion, 2004; The Economist, 2004).

Figure 1 Proportion of Population Relying on Biomass for Cooking and Heating (2000)



Note: SSA - Sub-Saharan Africa

Source: IEA, 2002; Overend and Craig, undated; Best and Christensen, undated

Furthermore, an estimated 57% of the world's poor (about 1.6 billion people) do not have access to electricity (table 1) and a significant portion have limited or no access to cleaner and more modern fuels such as kerosene, LPG and natural gas.

Table 1 Urban and Rural Electrification Levels (2000)

	Urban (%)	Rural (%)	National (%)
Developing Countries	85.6	51.1	64.2
Middle East	98.5	76.6	91.1
East Asia/China	98.5	81.0	86.9
Latin America	98.0	52.4	86.6
World	91.2	56.9	72.8
South Asia	68.2	30.1	40.8
Africa	63.1	16.9	34.3
Sub-Saharan Africa	48.9	9.9	21.7

* Excluding South Africa

Sources: World Bank, 2003; World Bank, 2004; IEA, 2002; GNESD, 2003; EDF Group, 2002.

The poor in developing countries face, inter alia, three key energy challenges:

- Reliance on biofuels that harm human health and the environment.
- Inadequate access to cleaner energy services, such as electricity, for productive purposes and institutional applications.
- Incomes that are too low (as well as limited access to appropriate financing schemes) to allow the poor to procure cleaner and more sustainable energy services, such as electricity, that are more expensive³.

In the last two decades, developing countries have implemented a wide range of energy sector reform initiatives, which were expected to, inter alia, address some of the above concerns. Initial indications from a wide range of developing countries, however, seem to indicate that few of these reform initiatives have resulted in significant improvement in the provision of cleaner energy services to the world's poor.

What is particularly worrisome about the above challenges is the deterioration in some countries in quality and reliability of energy services available to the poor in spite of numerous energy reform initiatives. This is particularly true in sub-Saharan Africa (and parts of Latin America & the Caribbean, Middle East and South Asia) where reliance on traditional biofuels is increasing and the proportion⁴ of unelectrified people continues to grow.

Some analysts contend that far from reducing energy poverty, market-oriented reforms may have increased energy poverty in parts of the developing world (Wamukonya, 2003; Lash, 2002; Bouille, Dubrovsky & Maurer, 2002; Dubash & Rajan, 2002). The analysts argue that from the onset, energy reforms were not designed to address the energy problems of the poor but were explicitly aimed at improving financial and technical efficiency of utilities, facilitating divestiture and guaranteeing future energy supply in an open globalized energy market (Wamukonya, 2003; Byrne & Mun, 2003; Fall & Wamukonya, 2003; Agbemabiese, Byrne & Bouille, 2003; Lash, 2002; Bouille, Dubrovsky & Maurer, 2002; Dubash & Rajan, 2002; Edjekumhene & Dubash, 2002).

An assessment of available literature reveals that, in the past, attempts have been made to study the impacts of energy sector reforms. However, most of these have focussed on the effects of reforms on the performance of power utilities and, to a limited extent, on electricity tariffs. Few studies have attempted to assess the impact of reforms on the poor or to provide empirical evidence of such impacts. The investigations of the GNESD "Energy Access" Working Group⁵ have resulted in detailed case studies designed to address this important gap.

³ Up-front costs of associated devices and appliances for cleaner and renewable energy options are often prohibitive for the poor.

⁴ In other words, although the absolute number of people with electricity is increasing, the rate of electrification is outpaced by population growth (Radka, 2002). This is especially true of many sub-Saharan African countries where electrification rates are below population growth rates.

⁵ Phase I of "Access" study involved eight (8) Centres assisted by an interim-Secretariat provisionally located at the UNEP Collaborating Centre on Energy and Environment (GNESD Secretariat) in Riso, Denmark. The Centres involved in the "Energy Access" Working Group (WG) and their respective regional coverage are listed below:

- African Energy Policy Research Network (AFREPREN/FWD) – East Africa
- Asia Institute of Technology (AIT) – South and South East Asia

The primary objective of the “Energy Access” Working Group was to examine the impact of energy sector reforms on the poor by responding to the following two key questions:

- Have previous energy policy reforms addressed the “energy access” challenge facing the poor or have the reforms actually contributed to the growing problem of inadequate energy services for the poor in the developing world?
- Based on rigorous analysis, which are the proven and robust policy options that would lead to improved, cleaner and more sustainable energy services for the poor in developing countries?

The articles in this Special Issue are arranged into three sections, namely: (i) case studies from Africa and the Middle East; (ii) case studies from South and South East Asia; and (iii), case studies from Latin America and the Caribbean. The key component linking all the articles in this issue is the focus on electricity access among the poor.

2.0 Case studies from Africa & Middle East

There are 2 articles covering the African and Middle East region. A total of 4 country case studies are assessed drawn from East Africa and Southern Africa.

The first article on East Africa authored by Karekezi and Kimani is based on country case studies of Kenya and Uganda. The article provides an overview of the status of poverty levels in the East Africa. It highlights that poverty levels are very high, particularly in the rural areas. For instance, in both Kenya and Uganda, virtually the entire (100%)⁶ rural population falls under the US\$ 2 per capita per day poverty threshold. Consequently, the rural population has been used as a proxy for the poor in this article.

The article reveals that only 1% of the rural households in Kenya and Uganda has access to electricity – implying that very few of the poor are electrified. The two country case studies demonstrate key shortfalls in the provision of electricity to the poor. First and foremost, the amended Electricity Acts do not sufficiently address the issue of the electrification of the poor (e.g. proposing new and innovative initiatives that would increase electrification of the poor). Secondly, the utilities, ministries of energy and regulatory agencies make no attempt to track electrification of the poor. Thirdly, the sequence of power sector reform measures appears to have been detrimental to electrification of the poor. In both countries, the rural electrification challenge was only addressed at the end of the reform process. Fourthly, reforms also appear to have failed

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- Energy and Development Research Centre (EDRC) now Energy Research Centre (ERC) – Southern Africa
 - Energy Research Institute (ERI) – China
 - Environnement et Developpement du Tiers Monde (ENDA-TM) – West Africa
 - Federal University of Rio de Janeiro (COPPE/UFRJ) – Brazil
 - Fundacion Bariloche (FB) – Latin America and the Caribbean
 - The Energy and Resources Institute (TERI) – South and South East Asia

⁶ Stated as 100%, as the few individuals with incomes higher than US\$ 2/day constitute a tiny total that adds up to a fraction of a decimal point (effectively, a rounding error).

to link rural electrification to the overall strategy of improving the performance of the electricity industry. Lastly, current rural electrification targets are very low and would leave well over 80% of the rural population with no electrification even if the targets are realized.

The East African article highlights the lack of sufficient data to ensure comprehensive assessment and conclusions regarding electricity access among the poor. Nevertheless, based on available data it tentatively concludes that although some of the reforms have a positive outcome, the analysis presented demonstrates that they have not led to significant electrification of the poor. As a result, only a comprehensive transformation of ongoing power sector reform efforts could improve the situation and lead to greater electrification of the poor. The article ends with some suggestions on how reforms could be amended to ensure greater access to electricity among the poor in East Africa.

The second article authored by Ogunlade and Mwakasonda presents the Southern Africa case studies of South Africa and Zimbabwe. In spite of the limited data available on the electrification of the poor, the case studies offer two different pictures on how Government policy intervention can help to improve electricity access among the poor and disadvantaged groups. Both South Africa and Zimbabwe have embarked on power sector reforms against a historical background in which a large majority of their citizens were deprived of electricity and other services on racial grounds. Addressing this deficiency has called for rapid and ambitious electrification programmes.

The South Africa case study discusses the major changes, including the energy sector, that the country is going through following the democratic elections in 1994. Government policy in this country is emphatic on addressing the enormous disparities in income levels and living conditions between the different racial groups as a result of apartheid. Consequently, the new Government embarked on a rigorous electrification programme whose objective was to increase electricity access among the poor and other disadvantaged groups. This article assesses the impact of South African Government's newly introduced subsidy on electricity consumption targeted at making electricity more affordable by the poor.

In the Zimbabwe case study, it is noted that the country experiences significant levels of poverty which can be traced back to the country's history of governance by the minority white government. After independence in 1980, the Government embarked on policies aimed at redressing imbalances of the past. This led to electrification programmes aimed at increasing electricity access to the previously disadvantaged people through expansion of grid electricity and off-grid electrification.

An emerging trend in South Africa and Zimbabwe is that, in spite of having gained independence during a time when privatization and pro-market reform of the power sector was sweeping across the continent, they both did not commence pro-market reforms until after undertaking substantial electrification. This appears to reflect the experience of other countries with high electrification levels such as Mauritius and supports the thesis that it is best to embark on electrification of the poor before (or at least, at the same time as) the initiation of pro-market reforms such as privatisation.

3.0 Case studies from South and South East Asia

This Special Issue contains 2 articles on south and south east Asian case studies. One of the articles covers India and Philippines while the other one is on Thailand and Bangladesh.

Authored by Sihag, Misra and Sharma, the article on India and Philippines assess the impact of power sector reforms on access, quality and reliability of electricity available to the poor. This article investigates these issues in a systematic manner by critically examining the impact of reform processes adopted in 3 selected states in India and in the Philippines, on electricity access among the poor. The article, however, highlights lack of data on the electrification of the poor as a key limitation to carrying out a comprehensive assessment.

Based on available data and information, the authors observe that the Indian reform legislation has focused more on improving financial viability of the ailing power sector at the expense of improving access to electricity. The legislation does not explicitly spell out the provisions for the extension of electricity services to the poor and the need and mechanism for subsidizing marginalized consumers. In contrast, the Philippines reform legislation has provisions for lifeline tariffs, cross-subsidies, subsidies and the expansion of the electricity grid network. The Philippines reform legislation stipulates a definite time frame for the elimination of cross-subsidy and at the same time it ensures subsidized rates for the identified poor.

The article on the Indian and Philippines case studies recommends the need for a proactive legislation that addresses access to reliable and affordable sources of electricity among the poor. For example, the establishment of legislative and policy support for mechanisms like the provision of lifeline rates and electrification of special functions like missionaries is required to effectively meet the electricity needs of the poor.

The second article on south and south east Asia is authored by Shrestha, Kumar, Sharma and Todoc. It discusses the institutional reforms for rural electrification (RE) in Thailand and Bangladesh. In both countries, rural electrification programmes commenced in 1977. In Thailand, the electrification programme led to an increase of electricity access among rural households from 19% in 1978 to about 97% by the year 2000. In Bangladesh, however, rural electrification levels rose from negligible level to only 19%.

The article identifies three key factors affecting the achievements of the rural electrification programs in the two countries. First and foremost was adequate electricity generation capacity. In Thailand, the generation capacity was sufficient to meet the growing demand from expansion in distribution network, whereas in Bangladesh, inadequate generation capacity appears to have affected rural electrification.

Secondly, the ability of the electricity distribution utilities to recover their costs appears to have been an important factor. In Thailand, the revenue from electricity sales fully covered the utilities' operational costs allowing the utilities to use the available financial resources to invest in grid extension. In Bangladesh, the utilities suffered financial losses which affected the availability of financial resources for grid extension.

Thirdly, high economic growth in the case of Thailand appears to have affected rural electrification by increasing the purchasing power of customers as well as increasing the resource base for the commercial and industrial electricity consumers. On the contrary, economic growth in Bangladesh was low - in part contributing to low rural electrification levels.

The article alludes to the lack of income-differentiated data to undertake the requisite assessment. However, available data enables the article to make some conclusions. In Thailand for example, the article concludes that the market-oriented reforms (i.e. privatization of generation and tariff reforms) that took place in the 1990s appear not to have affected the electrification levels and average household electricity consumption among the poor. This is largely due to the fact that market-oriented reforms were introduced at a time when the majority of the poor already had access to electricity.

In Bangladesh, the article concludes that the low rural electrification levels - compared to Thailand - are largely attributed to the poor financial performance of the electrification entities. On one hand, the rural entities had a very large number of household customers paying for electricity at subsidized tariffs. On the other hand, the commercial and industrial customers were too few to provide sufficient revenue to cover the subsidies given to the household customers. Consequently, the electrification entities ended incurring financial losses, hence, having limited resources available for new investment in rural electrification.

4.0 Case studies from Latin America and the Caribbean

This is the last section of the Special Issue and it contains 2 articles. The first article covers Argentina, Peru and El Salvador case studies while the second one covers Brazil.

Authored by Kozulj and Di Sbroiavacca, the first article assesses the impact of power sector reforms on the poor. The article highlights the absence of the requisite data to adequately assess the impact of reforms on the poor. In addition, the article discusses other challenges that further complicate the attempt to assess the act of power sector reforms on the poor.

The first challenge that the article highlights is the peculiar nature of poverty in the Latin America and the Caribbean (LAC) region compared to other parts of the developing world. The peculiarity of the LAC region stems from fact that the growth, in absolute terms, of the poor living in urban areas appears to be higher than in rural areas. By contrast, in other parts of the developing world, the bulk of the poor are in rural areas.

Secondly, the author emphasizes the difficulty of analyzing direct impacts of power sector reforms on energy access on the part of the poor. This is due to the fact that most of the indicators used in the assessment could be the result of other explanatory variables and not directly linked to sector reforms. For example, the growth of electrification rates could be the result of other factors such as the saturation level of the demand and urbanization processes, and not an outcome of reforms.

On the other hand, indicators of the impact of power sector reforms on electricity consumption and tariffs clearly show the negative effect of reforms on the poor. In addition, the case studies also reveal more subtle links between energy and macro-

economic reforms. This is particularly so because in this region, monetary appreciation (or overvalued currency) brought about the possibility of artificially establishing high profitability levels for privatized companies. Conversely, the macro-economic impact of such monetary appreciation was the creation of a large mass of unemployed people as a consequence of the substitution of local with imported production. This also led, then, to the creation of foreign debt, unemployment, devaluation and structural poverty. The authors conclude that the incidence of this indirect impact is much more significant than that of the direct impact of power sector reforms on the poor.

The second article on Latin America and the Caribbean is on the Brazilian case study. The article is authored by Goldemberg, La Rovere and Coelho and argues that the privatization of distribution and generation sub-sectors that took place in the early 1990s paid little attention to the expansion of the services to low-income and rural areas. For example, there were no incentives for electrification of low-income households and rural areas.

An assessment of recent legislature carried out in the case study provides convincing evidence that explicit and pro-poor measures are required to ensure that power sector reforms protect the interests of the poor. For example, in 1996, a decree (Law 9,427) was passed stipulating that half of the Reversion Global Reserve (RGR) - a fund for grid expansion and rural electrification - be directed to the regions with lowest electrification levels while the other half be allocated to rural electrification, energy efficiency, and electrical power for low-income users.

Another law was passed in 1996 compelling concessionaires to meet the full upfront cost of new connections. Furthermore, Law 10,438 was passed in 2002 to tighten universal service obligations on concessionaires. This law provided for reduction of the tariffs for low-income consumers as well as electrification targets for concessionaires.

This article extensively discusses two initiatives aimed at increasing electricity access among the poor especially in rural areas. One of the initiatives is PRODEEM whose mission is to provide viable decentralized electricity services using renewable and other sustainable energy sources. The other initiative is the *Luz no Campo* - Portuguese for 'light in the countryside' - an ambitious programme expected to finance grid extension to a million new rural customers.

The article concludes that the power sector reform process did not initially focus on expanding electricity access among the poor, especially through the concessionaires. In addition, the regulatory agency was unable to maintain electricity tariffs within inflation levels. Consequently, significant tariff hikes implied that the poor were severely affected.

5.0 Key Common Findings

Virtually all the case studies stress that the poor quality of data sets dividing electricity consumers specifically into "poor" and "non-poor" categories is a hindrance to the gathering of reliable empirical data on electrification. For some studies, this is interpreted as a strong indication that the poor have generally been overlooked in the reform process. This is a crucial data gap that needs to be filled to allow fully reliable assessment of access to electricity, and to strengthen the basis for policy recommendations.

The limitation in available data implies that the conclusions drawn from case study findings cannot be fully conclusive. Due to the aforementioned lack of reliable empirical data on electrification, some of the studies used proxies which can only provide general trends. A number of the case studies assessed only one reform option. This approach is constrained by the difficulty in distinguishing the effects of a single reform option from others put in place, especially where several options have been effected in a short span of time. As stressed by the Argentina case study, the impact of macro-economic reforms can cloud attempts to discern the impact of power sector reforms.

Based on the data and information available in the regional reports, the key common findings and conclusions of the articles covered in this issue suggest some important insights. First and foremost, in spite of the aforementioned data unavailability, almost all the reports tentatively conclude that, based on available empirical evidence, market-oriented reforms have either had a neutral or adverse impact on the poor and should be redesigned especially if the reforms are to be justified under a poverty-reduction agenda. The key identified negative impacts on the poor include:

- Reduction in electrification rates;
- Increased tariff levels; and,
- Decline in electricity consumption.

On the other hand, the articles also indicate that not all forms of reforms have been detrimental to the electrification of the poor⁷. Reforms in the Philippines, Thailand and South Africa have produced some positive results for electrification of the poor. Although they have implemented a variety of reforms and have used different systems to manage delivery of services, they have in common a high level of government involvement and special focus on protecting the interests of the poor.

Secondly, reforms introduced Rural Electrification Funds and other mechanisms for financing capital investment for rural electrification. In many countries, however, the Acts are not explicit on how the agencies responsible for managing the funds would account for the additional financing resources. In other words, the funds for electrifying the poor have not been protected - "ring-fenced" ⁸. Among the country case studies examined in the "Energy Access" study, Brazil and South Africa emerge as model examples of how to ring-fence the funds for electrification of the poor.

Thirdly, is the question of whether it is best to embark on widescale electrification of the poor prior to privatisation or vice versa – privatising and thereafter launching an electrification programme. Although the GNESD "Energy Access" study was not designed to address this question, the findings of the some of the regional studies provide some indication that the sequence of reforms is important.

Fourthly, with the exception of a few countries, reforms in most of the countries examined by the articles in this issue, did not provide an explicit focus on the poor. This finding is shared by other analysts who argue that, generally, past reforms have not been designed to address the energy problems of the poor.

⁷ In some countries, some of the reforms with anticipated positive impacts on the poor are yet to be implemented. For example, a number of the rural electrification agencies in Eastern and Western Africa stipulated in the amended Electricity Acts are not yet operational and financing of their electrification programmes is not fully assured.

⁸ The term "ring-fencing" refers to ensuring that funds are strictly accounted for and protected from any misallocation.

Lastly but by no means the least, a key finding of the articles is that, apart from ensuring explicit focus on the poor, involvement of the poor in the electrification process appears to be equally important. With the exception of South and South East Asian countries, there appears to be limited involvement of the poor in other regions covered by the articles in this issue.

To sum up, the various case studies assessed in this Special Issue appear to be at different stages of reforms as well as levels of electrification. This provides a useful opportunity for different regions to learn from each other. Specifically, the key findings of most articles provide valuable lessons for sub-Saharan Africa (and, to some extent, South Asia) – the least electrified region which is yet to implement many of the reforms effected in other regions of the developing world.

An important lesson from the Asian case studies is that the sequencing of reforms is key - the establishment of structures and mechanisms for increased electrification of the poor particularly in rural areas, ought to be in place before (or at least at the same time as) initiation of large-scale market-oriented reforms such as privatization. Thailand and the Philippines, initiated market-oriented reforms such as privatization well after establishing independent rural electrification agencies that ensured rapid rural electrification.

Secondly, the poor should be involved in the electrification process to ascertain that their concerns are addressed. This could be undertaken through different approaches. One way of involving the poor would be to ensure that the governing boards of the rural electrification agencies include representatives of the poor. Another approach that appears to have yielded positive results in Bangladesh is the rural electricity cooperatives approach. *Palli Biddut Samity* (local cooperatives), ensured grass-roots participation and ownership of the electricity distribution infrastructure and management.

To ensure that the objective of increasing access to the poor is achieved, the funds for the electrification of the poor should be “ring-fenced”, in other words, protected. Brazil and South Africa provide good examples on how the protection of electrification funds could be undertaken.

Finally, the analysis of the situation in some Latin America and Caribbean countries reveals that the links between energy and macro-economic reforms may be due to the subtle unsustainable policies which directly create poverty. This issue has not been dealt with in the current literature, but it points out the challenge of considering it seriously in future research. The recent energy crisis in Argentina, for example, demonstrates the weakness of the reforms, their flawed design and the social vulnerability that the poor are exposed to.

The case studies focus on selected examples of reform and do not pretend to close the debate on the nature of energy sector reforms. Nevertheless, they do point to an overarching conclusion: when reforms are introduced with the sole intention of improving the performance of utilities, the expected and hoped for social benefits do not necessarily follow. Where governments have not maintained a role of instigator or at least regulator of improved access to electricity by the poor, tariffs have tended to increase, and levels and rates of electrification have tended to drop. This strongly indicates that if the interests of the poor are to be adequately protected in the reform

process, their needs must be taken into account when designing reforms, and this must be backed by political commitment.

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