A Framework for Energy Sustainability Assessment

1.0 Introduction

The development of any sector of the economy presents many challenges for sustainable development – development that meets the needs of present generations, without compromising the ability of future generations to meet their own needs. Experience has shown that a pathway to sustainable development cannot be charted in advance. Rather, the pathway must be navigated through processes of learning and adaptation.\(^1\) This learned and adaptive navigation requires new types of analysis and communications tools to inform and influence the decision-making processes of governments, businesses and individuals. The Framework for Energy Sustainability Assessment (FESA) was born out of this need with a focus on public policy and the energy sector. While this framework was developed for the energy sector, it can be adapted to all sectors of development.

The FESA is a framework in several senses. First, it is a framework for highlighting a limited number of key sustainability issues of current relevance to energy development in a specific country. Second, it is a framework for assessing progress towards sustainability based on quantitative reference levels obtained from the policy literature. Third, the FESA assesses the extent to which a mix of policy instruments has been implemented to address the key issues. Finally, the FESA provides a framework for displaying the results in a simple and intuitive manner. The project’s display tool – the Energy Sustainability Gauge – embodies this framework.

The Energy Sustainability Gauge, shown in Figure 1-1, is an Internet-based analysis and communications tool designed to help governments and the public study the journey to economic, social and environmentally sustainable development. The Energy Sustainability Gauge has three primary components:

- An interactive menu to allow users to select from among a short list of salient issues relating to energy efficiency, security, access, and environmental sustainability;
- A component for assessing society’s progress toward sustainability based on a comparison of indicator data and quantitative reference levels found in the policy literature; and
- A component for assessing the extent to which a mix of policy instruments is being implemented by the national government to address the sustainability issues.

The components of the Energy Sustainability Gauge seek to answer the following questions:

- **What is the progress towards sustainability as defined by a specific indicator of energy sustainability?**
  - The gauge shows the sustainability progress trend and progress rate of the indicator.

- **Is the national government implementing a mix of policy instruments to address the issue?**
  - The gauge indicates the level of policy implementation including economic (e.g., taxes), regulatory (e.g., laws, competition and deregulation policy), expenditure (e.g., R&D) and institutional (green procurement, constitution of committees) instruments.

- **Interactive menu allowing a user to choose an indicator of energy sustainability representing efficiency, security, access and clean technologies**

Figure 1-1. Components of the energy sustainability gauge

A brief note on what the Energy Sustainability Gauge does not do is warranted at this point. First, the policy implementation component of the gauge does not provide a performance assessment of government policies. The quantitative reference levels selected to assess sustainability progress are not necessarily the objectives of the national government. Where such government-developed quantitative objectives are available they are used, and when they are not, we search the policy literature nationally and globally to find one that is most likely to be accepted by all stakeholders.

For this prototype version of the Energy Sustainability Gauge, we have focused our efforts on the energy sector in India and Canada, where the partners are based and our knowledge of the policy context is most sound. The project mandate was formulated as part a larger project called the TERI-Canada Energy Efficiency project undertaken by IISD and TERI. This larger project has as one of its research goals ‘to develop and apply methodologies for analyzing and measuring the efficiency and environmental impacts of programs and budgets affecting energy production and consumption.’

The measurement and assessment of progress toward sustainability is indispensable for making the concept of sustainable development operational. It helps decision makers and the public define sustainable development objectives and targets, and assess progress made in meeting those targets. Measurement also helps in making policy choices and the necessary policy corrections in response to changing realities. It

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provides an empirical and quantitative basis for making comparisons over time and across space and it offers an opportunity to find new correlations.

We assess the level of policy implementation for two reasons. The first is because public policy has the capacity to multiply the effect of a small change into a large impact, through the impact on the decisions made by both companies and consumers. The second is to provide an educational component for the interested public through the presentation and description of the range of policy instruments available to governments to effect change.

This paper presents both methods and results as they relate to: (1) identifying key issues; (2) assessing sustainability progress; (3) assessing the level of policy implementation; and (3) communicating the results. The remainder of this section summarizes the overarching goals and specific objectives of the FESA project, articulates the need for measuring progress, establishes the guidelines for the project development, and outlines the technical approach that we followed.

1.1 Goals and objectives

At the highest and most general level, the goal of the overall TERI-Canada Energy Efficiency Project is to contribute to sound development in India and Canada, focusing on the energy sector.

The objective of the FESA project is to influence national level policy in the energy sector in both India and Canada so that policy will better reflect sustainable development considerations. Our intended audience for the FESA is dual:

- The interested public – to learn of key issues and their progress in relation to sustainability, and learn about the mix of policy instruments available to governments for effecting change; and
- The interested policy community – to take stock of the progress toward sustainability in relation to key issues and of the extent to which a mix of policy instruments are being implemented to address these issues.

By addressing this dual audience we position the Energy Sustainability Gauge as an analysis and communications tool that could be used by governmental and non-governmental organizations to link the indicator monitoring and decision making processes. Our hope is that this tool be used year after year and in many sectors of the economy, and most importantly, be an effective and pragmatic tool to help decision-makers and the public navigate the transition to a sustainable future.
1.2 Need for measurement and assessment

The primary goal of measurement is to help decision makers evaluate their performance in achieving goals and targets. Measurement also provides a basis for planning future actions. For these purposes, decision-makers need tools to connect past and present activities to future goals. Indicators are central among these tools.

Thus, measurement is useful for decision makers particularly because it helps:

- **Understand what sustainable development means in operational terms.** In this sense, measurement and indicators are explanatory tools, translating the concepts of sustainable development into practical terms;
- **Make policy choices to move toward sustainable development.** Measurement and indicators create linkages between everyday activities and sustainable development. Indicators provide a sense of direction for decision makers when they choose among policy alternatives: they are planning tools; and
- **Decide the degree to which efforts are successful in meeting sustainable development goals and objectives.** In this sense, measurement and indicators are performance assessment tools.

There are essentially four stages to be understood and addressed in the measurement process:

- Activities that create problems in local ecosystems and the global environment, in the national and local economy, and in communities and individuals;
- The resulting changes in the ecosystems, economy, communities and individuals, both short and long-term, reversible and irreversible;
- Stakeholder responses, their extent and impact; and
- Communicating results.

In practice, we do not have full knowledge of each of the above stages. As a result, decisions about what to measure must be based on judgments about what is important. These judgments differ according to the situation and understanding. While it may be more logical to agree on a common understanding of sustainable development before deciding what to measure, in practice both discussions are going on simultaneously. This reflects the real need for measurement tools, especially ones that help deal with uncertainty.

1.3 Guidelines for FESA

Guiding the technical approach for the FESA are three criteria used in the critical appraisal of scientific inquiries with policy implications – saliency, credibility and
legitimacy and a fourth criterion – usability – relevant in the design of communication tools.

The **saliency** criterion poses the question – *will anyone care?* We built saliency into our assessment by selecting broad sustainability objectives for the energy sector that are widely shared – efficiency, security, access, and clean technologies. Additionally, we assess progress toward sustainability by identifying issues and indicators for these sustainability objectives and comparing the indicator trends to broadly shared quantitative reference levels. Staying within the bounds of this arena of shared concerns is important to maintain focus on the message and not be diverted toward a discussion concentrating on why the quantitative reference levels were chosen, the alternatives, and so on.

**Credibility** addresses the question – *can people believe it?* This criterion deals with the technical accuracy of results, analyses and conclusions. We address credibility by engaging the experience and expertise of the two research organizations as well as by using data from credible sources and through internal and external review procedures to ensure the usefulness of the tools and the accuracy of data analysis and assessment.

The **legitimacy** criterion is concerned with the question – *can people trust it?* An assessment can have credibility and not have legitimacy. For example, a global assessment of climate change could be produced by some of the top scientists in the world; however, if all the scientists were from one country, the assessment would likely not have legitimacy in the eyes of other nations. We build legitimacy into our assessment by applying the Energy Sustainability Gauge to the host countries of our two project institutions (India and Canada).

Additionally, we build legitimacy by assessing the level of policy implementation based on a wide array of policy instruments. Finally, we ensured that multiple perspectives were included in our analysis via the use of a three-pillar sustainability framework (economic, social and environmental) for identifying broad objectives in the energy sector and representative indicators.

The **usability** criterion – *will people understand it?* – was particularly important in this project given that our objective was to develop a tool to communicate with government decision-makers and the interested public. We built usability into our assessment by keeping the number of indicators we assess and display to a small number. We employed the metaphor of a vehicle dashboard to make our display simple, intuitive and attractive to the audience. Additionally, the indicators themselves should also be simple and intuitive to understand – we want people who see the results to be able to quickly absorb the meaning and see the implications. This will add impact to the work.

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3 The criteria of saliency, credibility and legitimacy were put forth by Clark, W. and G. Majone (1985). The critical appraisal of scientific inquiry with policy implications. Science, technology and human values, 10(3): 121-147.

1.4 Project funding

The FESA project is funded by the Canadian International Development Agency (CIDA) and is part of a larger project called the TERI-Canada Energy Efficiency Project. This larger project was discussed and planned between 1995 and 1997, and preliminary implementation was undertaken in 1997 and 1998. With the commitment to a 3-year funding agreement by the Canadian International Development Agency (CIDA) in September 1999, the project then put into effect its research and outreach plans.

1.5 Report structure

The FESA is outlined in Section 2 and includes detailed descriptions of the analytical approaches and presentation tools.

The application of the *Energy Sustainability Gauges* in India and Canada are presented in Sections 3 and 4, respectively. Each section provides an overview of their respective energy sectors and presents the results and analysis of the assessment of sustainability progress and policy implementation.

In Section 5 we provide a comparative assessment of the Energy Sustainability Gauge results for India and Canada with the objective of identifying and understanding the differences in sustainability progress and policy implementation, and learning from them.

Finally in Section 6 we identify and recommend potential next steps in the use of the Energy Sustainability Gauges.