



Energy and Environment Goals: A Discussion

Discussion paper

Environment and energy are included in the focus areas identified by the Open Working Group of sustainable development goals and the universal goals identified in the Report of the High-Level Panel of Eminent Persons on the Post-2015 Development Agenda. This discussion paper gives an overview of the policy discourse and examines the state of data availability to arrive at indicators to inform energy and environment goals in India.

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The discussion paper is an output of a project on energy and environment indices under DFID-TERI Partnership for Clean Energy Access and Improved Policies for Sustainable Development.

This paper will also be available as a chapter in TERI Energy & Environment Data Directory and Yearbook (TEDDY) 2013-14.

THE Outcome Document of the 2010 MDG (Millennium Development Goal) Summit requested the Secretary-General to initiate thinking on the global development agenda beyond 2015. The outcome document of the 2012 United Nations Conference on Sustainable Development (UNCSD), popularly known as Rio+20, initiated an inclusive process to develop a set of sustainable development goals. There is broad agreement that the two processes should be closely linked and should ultimately converge in one global development agenda beyond 2015 with sustainable development at its core. Box 1 describes the nature of the Sustainable Development Goals (SDGs) as discussed in the Outcome Document of Rio+20 – The Future We Want.

Box 1: Nature of the Sustainable Development Goals

In the Rio+20 outcome document, member States agreed that sustainable development goals (SDGs) must:

1. Be based on Agenda 21 and the Johannesburg Plan of Implementation.
2. Fully respect all the Rio Principles.
3. Be consistent with international law.
4. Build upon commitments already made.
5. Contribute to the full implementation of the outcomes of all major summits in the economic, social and environmental fields.
6. Focus on priority areas for the achievement of sustainable development, being guided by the outcome document.
7. Address and incorporate in a balanced way all three dimensions of sustainable development and their inter-linkages.
8. Be coherent with and integrated into the United Nations development agenda beyond 2015.
9. Not divert focus or effort from the achievement of the Millennium Development Goals.
10. Include active involvement of all relevant stakeholders, as appropriate, in the process.

Source: *UNCSD (2012)*

It has also been understood that the goals within the post-2015 development agenda may require different or differentiated targets that consider different national circumstances and “capabilities”, to make targets equally ambitious and achievable for all countries. OWG (2014a) discusses the five conceptual issues of universality, inclusiveness, broad scope of the agenda, inter-linkages/cross cutting issues, and means vs. ends/outcomes as crucial elements of the measurement framework of the post-2015 development agenda.

The Open Working Group¹ of Sustainable Development Goals, in February 2014, has come out with a list of nineteen focus areas for consideration (Table 1). The High-Level Panel of Eminent Persons on the Post-2015 Development Agenda commissioned by the UN Secretary-General in its report submitted to the Secretary-General in May 2013 highlights twelve goals for post-2015 goals (Table 2).

¹In January 2013, the Open Working Group was established by the General Assembly to steer the formulation of the proposal on sustainable development goals (SDGs). Having elected its Co-chairs and adopted the methods and programme of work, from March 2013 to February 2014, the Group conducted a total of eight sessions on the various themes identified in the Rio+20 outcome document

Table 1: Focus areas identified by the Open Working Group of Sustainable Development Goals

Focus area 1. Poverty eradication
Focus area 2. Food security and nutrition
Focus area 3. Health and population dynamics
Focus area 4. Education
Focus area 5. Gender equality and women's empowerment
Focus area 6. Water and sanitation
Focus area 7. Energy
Focus area 8. Economic Growth
Focus area 9. Industrialization
Focus area 10. Infrastructure
Focus area 11. Employment and decent work for all
Focus area 12. Promoting equality
Focus area 13. Sustainable cities and human settlements
Focus area 14. Sustainable Consumption and Production
Focus area 15. Climate
Focus area 16. Marine resources, oceans and seas
Focus area 17. Ecosystems and biodiversity
Focus area 18. Means of implementation
Focus area 19. Peaceful and non-violent societies, capable institutions

Source: OWG (2014b)

Table 2: Universal Goals as identified in the Report of the High-Level Panel of Eminent Persons on the Post-2015 Development Agenda

Goal 1. End Poverty
Goal 2. Empower Girls and Women and Achieve Gender Equality
Goal 3. Provide Quality Education and Lifelong Learning
Goal 4. Ensure Healthy Lives
Goal 5. Ensure Food Security and Good Nutrition
Goal 6. Achieve Universal Access to Water and Sanitation
Goal 7. Secure Sustainable Energy
Goal 8. Create Jobs, Sustainable Livelihoods, and Equitable Growth
Goal 9. Manage Natural Resource Assets Sustainably
Goal 10. Ensure Good Governance and Effective Institutions
Goal 11. Ensure Stable and Peaceful Societies
Goal 12. Create a Global Enabling Environment and Catalyse Long-Term Finance

Source: HLP (2013)

Given the number of focus areas, the new development agenda calls for significant increase regarding data demands, both in terms of scope and levels of details (disaggregation). There is a need to fill existing data gaps and will require significant capacity building efforts in countries and a partnership for data development, involving all stakeholders. ABS (2013)

ranks the dimensions of sustainable development in terms of data availability² as follows: Economic statistics – Gold, Social statistics – Silver, Environment statistics – Bronze, Governance statistics – Tin.

For larger policy considerations, to ensure measurability and accountability, national statisticians should be involved early on in the discussion and design of goals and in particular targets in order to provide their expertise and contribute their experiences from the monitoring of the MDGs and other monitoring efforts. The importance of national ownership in measuring and monitoring by considering national requirements, priorities and capacities has also an important learning from MDG monitoring processes.

“Sustainable Energy” and “Environmental Sustainability” as policy goals

Energy is a fundamental requisite to growth and development. Energy is required for basic human needs to deliver adequate energy services, food, water, health care, education, shelter, gender considerations, and employment. The relationship between energy and human well-being is depicted in the relationship between per capita energy use and the Human Development Index (HDI). At the same time, economic growth powered by fossil fuel based energy consumption has been a major contributor to greenhouse gases (GHGs), leading to anthropogenic climate change (IPCC 2007).

Especially in context of India, choices made in its energy sector seem to have important linkages to its sustainable development parameters such as water, energy, health, biodiversity and has economy-wide implications (Srivatsva 1997; Srivastava & Rehman 2006). India has also endorsed the major global initiative of Sustainable Energy For All, which was launched by the Secretary General of the United Nations and the President of the World Bank. The initiative which has spurred country level actions signifies the relevance of energy in context of sustainable development and includes provision of universal energy access, doubling the share of renewables and improving energy efficiency across the economy³. Box 2 discusses the basis of energy as a focus area for Sustainable Development Goals (OWG 2014).

² ABS (2013) considers the targets in the High-Level Panel of Eminent Persons on the Post-2015 Development Agenda Report and the Sustainable Development Solutions Network Report.

³ More details available at: <http://www.se4all.org/>

Box 2: Energy as a Focus Area in designing Sustainable Development Goals

Energy plays a critical role as an engine for economic growth and social development. Ensuring access to affordable, modern and reliable energy resources for all is also important for poverty eradication and provision of basic services. Yet, as energy use presents opportunities, it also presents many sustainable development challenges that need to be addressed. Some areas that could be considered include: ensuring universal access, for both women and men, to modern energy services; deployment of cleaner including low- or zero-emissions energy technologies; increasing the share of renewable energy in the global energy mix, including by providing policy space and necessary incentives for renewable energy; improving energy efficiency in buildings, industry, agriculture and transport; phasing out inefficient fossil fuel subsidies that encourage wasteful consumption; mobilizing finance to invest in modern energy infrastructure; sharing knowledge and experience on appropriate regulatory frameworks and enabling environments; promoting partnerships on sustainable energy; building capacity and transferring modern energy technologies. Inter-linkages to other focus areas include, in addition to poverty eradication and economic growth, food security, education, health, water, gender equality, sustainable consumption and production, and climate change.

Source: OWG (2014b)

Increasing human population requires more natural resources including water, land and materials that have implications for carrying capacity of ecosystems. Also, the relationship between socio-economic progress and environment sustainability has been made implicit in many policy documents. For instance India's Twelfth Five Year Plan explicitly recognizes, "achievement of rapid and sustainable growth is critically dependent on our ability to manage our natural resources effectively" (Planning Commission 2012). The Thirteenth Finance Commission report also explicitly recognizes the link between environment sustainability and inclusive growth when articulating "green growth". Box 3, depicts the key areas under consideration when discussing environmental sustainability for Sustainable Development Goals (OWG 2014a).

Box 3: Environmental sustainability and Sustainable Development Goals

While discussing the focus areas as discussed by the Open Working Group on Sustainable Development Goals (OWG 2014b), three focus areas can be considered are core to environmental sustainability; these include:

- Climate
- Marine resources, oceans and seas
- Ecosystems and biodiversity

Targets for the Goal of Managing Natural Resource Assets Sustainably identified in HLP (2013)

- a) Publish and use economic, social and environmental accounts in all governments and major companies
- b) Increase consideration of sustainability in x% of government procurements
- c) Safeguard ecosystems, species and genetic diversity
- d) Reduce deforestation by x% and increase reforestation by y%
- e) Improve soil quality, reduce soil erosion by x tonnes and combat desertification

In India 56% of the population is dependent on activities related to natural resource management. Water availability is approaching the scarcity benchmark of 1000 m³ per capita (TERI 2009). According to recent analysis, coal and oil together account for approximately 86% of the total primary energy supply in India (TERI 2013). Based on different research studies, the estimated economic cost of degradation for India ranges from 3.5%–7.5% of its GDP (in CAEP-TERI [2011]). Access to modern energy is one the major areas of concern (MNRE 2013). According to Census (2011), only 55% of the rural households have access to electricity (92.8 million households out of 167.8 million rural households). In few states the households electrification level is strikingly low (Bihar - 10.4%, Assam - 28.4%, Uttar Pradesh 23.8%, Odisha - 35.6%, Jharkhand 32.3; and West Bengal - 40.3%). About 86% of rural households depend on traditional biomass fuels to meet their cooking requirements. Also, 23.2% of the urban households rely on traditional fuels to meet their cooking needs.

Indicators for informing energy and environment goals

Environmental indicators are powerful tools for tracking environmental progress, providing policy feedback and measuring environmental performance. There have been several studies which have undertaken the exercise of developing indicators for analysing the status of environment and sustainable development at the level of Indian states (Mukherjee & Chakraborty, 2007; Nagar, Ray, Sawhney, & Samanta 2008; IFMR 2011). These studies highlight the importance of environmental indicators and recognize that indicators like these are instrumental in promoting information and evidence-based policy making, help by providing guidance at prioritising among different environmental concerns and identify the most pressing issues which may require policy action and budget allocation. It can therefore be said that to a fair extent, such indicators help measure and monitor sustainable development. However, important lags remain between the demand for environmental indicators, related conceptual work and the actual capacity to mobilize underlying data sets. Selection of appropriate indices and methodology for arriving at appropriate indices is a matter of much debate and research.

Considering the influence of unabated environmental pollution on many sectors of the economy and economic damage to ecosystems and society, it is considered necessary to evolve an index and recognize environmental performance by states. We will seek to develop a set of set of metrics through indicators that will serve as a gauge of long-term policy success for addressing issues around energy and environment in India. The indicators will seek to be disaggregated at the state level and states with higher scores would be characterized by cleaner environment, energy sufficiency and access to basic services.

The metrics will seek to serve three core objectives

- (i) Inform the global sustainable development goals by considering the circumstances in a national setting – in this case India.
- (ii) Provide clear policy guidance through a balanced coverage of the key features of sustainable energy and environmental sustainability parameters.
- (iii) Facilitate benchmarking for cross-state comparison and quantify sustainable development along economic, social and ecological well-being.

A composite index will be developed for the states using the indicator. The goals identified are sustainable energy, environmental sustainability, and cross-cutting social goals (Table 3).

Table 3: Selected indicators for energy and environment goals

Policy categories	Sample Indicator
Sustainable Energy Goals	
Energy sufficiency	% of villages electrified state-wise for the latest reporting period
	State-wise estimated energy surplus/deficit for the latest reporting period
	State-wise estimated peak surplus/deficit for the latest reporting period
	State-wise energy intensity for the latest reporting period
	State-wise % change in population having access to clean energy(LPG) for cooking in rural areas
	State-wise % change in population having access to clean energy(LPG) for cooking in urban areas
	State-wise % change in population having access to clean energy (electricity) for lighting in rural areas
	State-wise % change in population having access to clean energy (electricity) for lighting in urban areas
Energy efficiency	State-wise aggregate transmission and distribution losses incurred by discoms as a % of power availability
	State-wise aggregate technical and commercial losses incurred by discoms as a % of power availability
Clean energy	State-wise solar RPO (Renewable Purchase Obligation) gap to be achieved as per latest reporting period
	State-wise estimated potential and cumulative achievements for family type biogas plants
Environmental Sustainability Goals	
Clean Air	State-wise average Annual concentration of SO ₂ levels
	State-wise average Annual concentration of NO ₂ levels
	State-wise average Annual concentration of RSPM levels
	State-wise exceedance factor of RSPM
Waste management	State-wise collection efficiency of solid waste
	State-wise treatment capacity for solid waste
Improved green cover	State-wise % change in forest area of State geographical area
Better land quality	State-wise % change in land under scrubs of State geographical area
	State-wise % change in fallow land of State geographical area
	State-wise % change land under wastelands of State geographical area
	State-wise % change in land under water bodies of State geographical area
	State-wise % change in shrub/degraded land of State geographical area
	State-wise % change in built up area(Rural +Urban) of State geographical area

Policy categories	Sample Indicator
	area
Water quantity	State-wise % change in Net availability of groundwater
	State-wise % change in total availability of groundwater draft
Water quality	State-wise % change in surface water violations with respect to Dissolvable Oxygen(DO)
	State-wise % change in surface water violations with respect to pH
	State-wise % change in surface water violations with respect to Biochemical Oxygen Demand(BOD)
	State-wise % change in surface water violations with respect to Conductivity
	State-wise % change in surface water violations with respect to total Coliform(TC)
	State-wise % change in ground water violations with respect to pH
	State-wise % change in ground water violations with respect to Conductivity
	State-wise % change in ground water violations with respect to BOD
	State-wise % change in ground water violations with respect to pH
	Social Goals
Better health infrastructure	State-wise malaria cases as a % of state population as per latest reporting period
	State-wise deaths as a % malaria cases as per latest reporting period
	State-wise acute diarrheal cases as a % of state population as per latest reporting period
	State-wise deaths as a % acute diarrhoeal cases as per latest reporting period
	State-wise respiratory infection cases as a % of state population as per latest reporting period
	State-wise deaths as a % respiratory infection cases as per latest reporting period
Access to clean drinking water	State-wise no. of households having access to clean drinking water in rural areas
	State-wise no. of households having access to clean drinking water in urban areas

Developing indicators

In order to aggregate the indicators in a single number, they need to be normalized, in such a way that every indicator will obtain a value $I(x)$, where $0 \leq (I(x)) \leq 1$ with x the value of every indicator under each cluster.

$$I(x) = \frac{x - \min(x)}{\max(x) - \min(x)}$$

After the values of the indicators are normalized by estimating Z score for each of the indicators, they would be aggregated into a single final score. Weights, representing the relative importance of that criterion will be assigned to each of the clusters. Given that each of the k experts may have different preferences about indicators, they could express different weights at each sub-node (for each indicator). An average would be calculated for each of the indicator and accordingly weights would be imparted to each indicator.

Next Steps

The next steps in the project will involve construction of the metrics and consultative process for target setting and weightage. Weights would be collected through a survey to a panel of experts working in the field of climate change, energy and environment and policy. The project will also involve consultation with stakeholders through brainstorming sessions. The activities of the project with any key outputs will be updated on TEDDY website – teriin.org/projects/teddy. The objective of the project on energy and environment indices is to support policy development and build capacity of TERI's annual flagship publication, TEDDY (TERI Energy & Environment Data Directory and Yearbook) through content strengthening. The intent would be to develop the indices for states of India that could be featured in the forthcoming issues of the annual flagship publication.

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