



# **‘Circular Economy in Electronics and Electrical Equipment (EEE) Sector and its Scope and Relevance in North East India’s Challenges in e-Wastes Management’**

**June 15, 2021**

**Panel Discussion Report**

# Circular Economy in Electronics and Electrical Equipment (EEE) Sector and its Scope and Relevance in North East India's Challenges in e-Wastes Management'

Discussion Brief 2021

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## 1. INTRODUCTION

In the wake of a resource depleting global economic system, the need for a new system with effective resource performance has become increasingly important. It is in such a situation that debates and conversations around circular economy have been increasingly emerging. Circular economy (CE) is an industrial system, which is an alternative to highly extractive and resource intensive linear economy principle of take-make-dispose and replaces the end-of-life concept with restoration and regeneration, aims at retaining value of resources, products and materials at their highest.

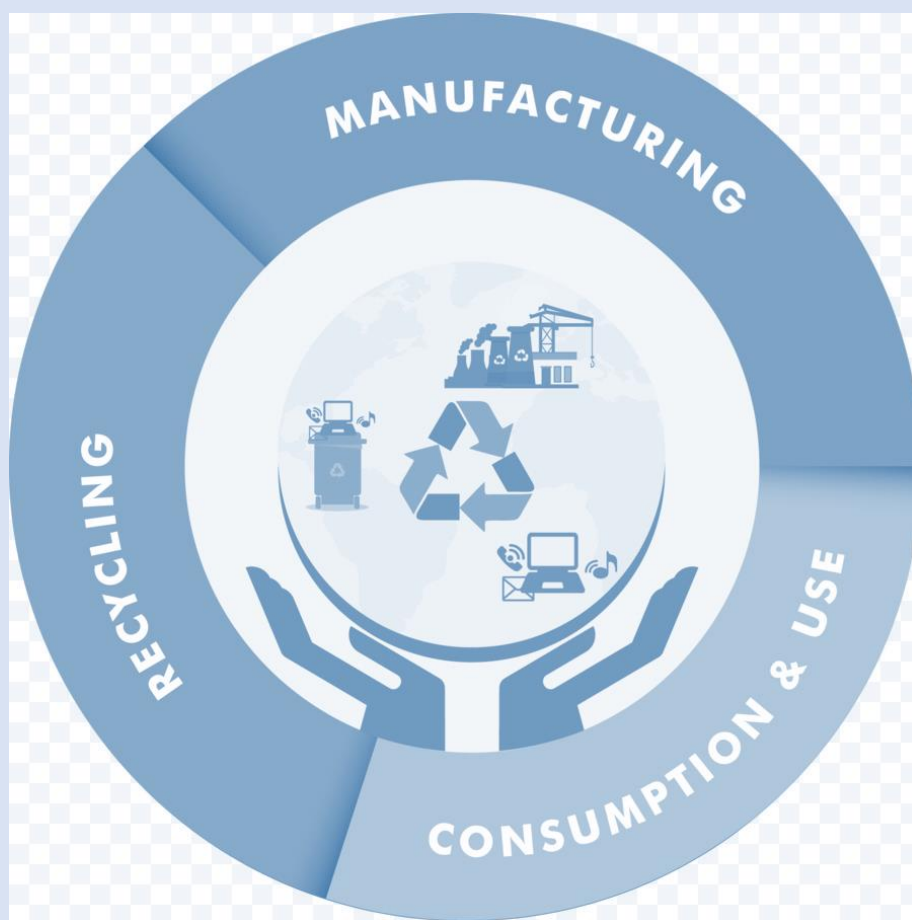
Starting with the industrial revolution, the linear 'take-make' dispose pattern has been governing the world economies. Under this model, companies harvest and extract materials, use them to manufacture a product, and sell the product to a consumer. The consumer then discards the product when it no longer serves its purpose. In fact, in terms of volume, around 65 billion tonnes of raw materials entered the economic system in 2010, and was expected to grow to about 82 billion tonnes by 2020.

India is the third largest consumers of raw materials produced globally and estimated to consume nearly 15 billion tonnes of material by 2030 and a little above 25 billion tonnes by 2050 including Electronic and Electrical Equipment (EEE). EEE waste is considered as one of the rich sources of secondary raw materials and can contribute towards resource security and environmental sustainability. In fact, India is the third most electronic waste (e-waste) generated country (with 3.2 million tonnes in 2019) in the world. However, only 10 per cent of its e-waste is collected for recycling. The collection and management of EEE waste remain a key challenge. This necessitates the shift to a more circular approach for the sector.

It is found out that existing regulations and policy can act as an important tool towards a transition to CE. In India, the Ministry of Environment, Forest, and Climate Change notified the E-Waste Management Rules in 2016 which includes a concept of Extended Producer Responsibility (EPR) which rests on circularity principles. The Organization of Economic Co-operation and Development (OECD) define EPR as an environmental policy approach in which a producer's responsibility for a product is extended to the post-consumer stage of a product's life cycle.

The NITI Aayog thus entrusted the Ministry of Electronics and Information Technology to formulate an action plan for implementation of circular economy principles in the e-waste sector. This will focus on lifecycle of electronics including stages of raw material acquisition, design, manufacturing/production stage, consumption to end of life (e-waste) management, and secondary raw materials utilization.

The Council for Social and Digital Development, Digital Empowerment Foundation, and the North-East Development Foundation, together had organized a North East Knowledge Xchange (NEKX) panel discussion on “Circular Economy in Electronics and Electrical Equipment (EEE) Sector in India and its Relevance and Impact in North East India” on 15<sup>th</sup> of June, 2021. This report is an attempt to bring out the suggestions and important discussion points from the session.



## 2. BACKGROUND

Circular economy (CE) is an industrial system that is restorative or regenerative by intention and design. As India recovers from the COVID-19 and its on society and economy, self-reliance or Atmanirbhar Bharat becomes crucial to address the challenges of an unsustainable system and recover back through sustainable growth models.

Discussions around e-waste are often ignored. The need for a circular economy needs to be explained and understood by the manufacturing as well as the technical sectors. A circular economy approach to management of e-waste will play an important role in resource efficiency, reduction in pollution and waste, longer product-life, recovery of precious and rare materials, minimization of occupational and health hazards as well as in giving an impetus to the evolution of recycling industry, thereby leading to formalization and job creation. While India has abundance of iron ore and bauxite, it remains import dependent on many essential materials for production of EEE products. A CE approach becomes more significant.

The National Policy on Electronics (NPE) 2019 envisions positioning India as a global hub for Electronics System Design and Manufacturing (ESDM). To address this vision of 'Make in India', the Ministry of Electronics and Information Technology launched a 'Product Linked Incentive Scheme (PLI)'. This scheme provides a big push to move towards sustainable product policy, towards sustainability and green manufacturing.

India has the benefit of a huge demographic dividend. This large labour force along with investments in advanced recycling technology can make the transition to circular electronics sector easier. Such a transition would generate better outcomes for the Indian producers, consumers, society and environment at large.

### 3. STATE OF E-WASTES AND SCOPE AND RELEVANCE FOR CIRCULAR ECONOMY IN EEE IN NORTH EAST INDIA

India witnessed a six-fold increase from 1.18 billion tonnes in annual material consumption between 1970 and 2015. This figure is estimated to increase in the coming years due to population growth, urbanization, economic mobility, and the resulting growth in per capita resource consumption. India's resource extraction of 1,580 tonnes/acre is 251% higher than the world average of 450 tonnes/acre. While Europe recycles 70% of its consumption items, India recycles only 20%. India is also the third highest emitter of greenhouse gases, and accounts for 9.2% of total world emissions.<sup>1</sup>

The North-Eastern region of the country becomes important in this discussion as it is seeking to emerge out of years of isolation. With policies like Look East and increasing investment in the region, it is undeniable that a discourse around circular economy is need of the hour. Given the different and hilly terrain of the region, the NE states are especially vulnerable to climate change and climate related disasters. The tackling of waste and e-waste become especially important.

The table 1 below looks at the solid waste generation in the region in the years 1999-2000 and 2009-14.

State	Solid Waste Generated MT/Day (1999-2000)	Solid Waste Generated MT/Day (2009-14)
Assam	285	1,146.28
Arunachal Pradesh	-	93.802
Manipur	40	112.9
Meghalaya	35	284.6
Mizoram	46	4,742
Nagaland	-	187.6
Tripura	33	360
Sikkim	-	40

**Table 1: Solid waste generation in the NER in 1999-2000 and 2009-14 (Source: Data from Ministry of Environment, Forest, and Climate Change)**

It is clear from the table that every state in the NE region has seen an immense rise in waste generation in the last few years. With increasing industrialization and rising non-farm sector, the region needs to transition towards a circular economic system along

<sup>1</sup> <https://www.orfonline.org/expert-speak/india-rebuilds-economy-time-make-circular-sustainable/>

with the rest of the country. As India aspires to become a global manufacturing hub, the role of the NE states will become increasingly important. In the coming years, we might witness higher levels of consumption of raw materials than what's required to meet India's domestic needs. Therefore, India's traditional take-make-waste linear economic approach will cause severe ecological damage with untoward economic and social ramifications.

Currently, India recycles only 20% of its consumption. The leading states with largest waste recycling capacity across India till 2016 were Uttar Pradesh, Rajasthan, Tamil Nadu, Haryana, Maharashtra, Karnataka, Gujarat, Uttarakhand, Telangana, and Madhya Pradesh. No NE state features in this list. While the larger states feature more highly in this list, but there are exceptions. Hence, there is enormous scope for improvements in this area and this provides opportunity for innovation and employment. The journey from the current linear economic model to a circular economic model is filled with both ecological and economic benefits.

The table 2 below looks at the solid waste generated and processed up to November, 2018.

State	Solid Waste Generated MT/Day (2018)	Total Waste Processing
Assam	413,910	35%
Arunachal Pradesh	66,065	20%
Manipur	64,240	50%
Meghalaya	97,820	58%
Mizoram	73,365	4%
Nagaland	124,830	52%
Tripura	153,300	45%
Sikkim	32,485	66%

**Table 2: Solid waste generated and process in NER (Source: Data from Ministry of Environment, Forest, and Climate Change)**

The table above shows that expect Sikkim, Nagaland, and Manipur, all the other states have a waste processing percentage less than half.

The table 3 below looks at hazardous waste generation in the region in the same time period.



State	Quantity of Hazardous Waste generation (MTA)
Assam	29434.64
Arunachal Pradesh	Information not available
Manipur	Information not available
Meghalaya	75.8
Mizoram	0.00
Nagaland	10
Tripura	270.19
Sikkim	785.472

**Table 3: Hazardous waste generation in NER (Source: Data from Ministry of Environment, Forest, and Climate Change)**



#### 4. KEY DISCUSSION POINTS

The panel discussion feature **Prof Yumnam Jayanta Singh**, Director at National Institute of Electronics and Information Technology (NIELIT), Guwahati, with additional charge of Shillong; **Mr Achitra Borgohain**, Trustee at United Global Trust which has set up the first and currently the only e-waste recycling unit in the Northeast; **Ms Sowete-u K Letro**, e-CIRCLE, an organization handling electronic waste sustainably in Nagaland; **Dr Dinesh Bhatia**, Associate Professor, Department of Biomedical Engineering, North Eastern Hill University (NEHU), Shillong, Meghalaya; **and Kapil Nayal**, Director-in Charge, NIELIT Gangtok.

The panel discussion gave rise to several key points and suggestions. We are listing them down here as per the speaker.

##### **Prof Yumnam Jayanta Singh**

One of the key suggestions that Prof Singh suggested was the need to have community level engagement in the area and emphasized on the need to have local people to manage and raise awareness regarding this. Because of low to no accountability of e-wastes that is being generated, it is important to have responsible people along with private partners from the states. The private partners need some form of financial support for this along with a project evaluation team in the local level to target each individual.

##### **Mr Achitra Borgohain**

One of the key points Mr Borgohain focused on was how there are various government schemes with respect to start-ups, but people lack the immediate knowledge regarding them and often find themselves lost with regard to where to get specific information from. There should be an easier way for this.

He also focused on raising awareness at the community level.

##### **Ms Sowete-u K Letro**

Ms Letro suggested more support from the concerned authority regarding e-waste along with guidelines regarding the same. She also suggested the setting up of collection centres which can properly guide the individuals regarding training rules and e-waste disposal behaviour. She also focused on the need for various agencies like Pollution Control Board and individuals to work together.

## **Dr Dinesh Bhatia**

Dr Bhatia suggested a bigger role of companies in terms of taking responsibility by contributing and picking up the waste. He also highlighted the need for coordination between the various stakeholders.

## **Kapil Noyal**

Mr Noyal suggested the need for programs like E-Swachchata Mission which can work like the Swachchata Mission. He emphasized on the need to fill the gap between waste disposal and waste generation. He suggested the need to have more centres which can raise awareness about e-waste generation and collection.

He also recognized how the concept of knowledge spill-over in this area. He suggested learning the best practices of countries who are effectively dealing with e-wastes by sending our best agents there. Knowledge sharing from countries which are doing well in e-waste can do wonders in the North-East.



## **5. THE WAY FORWARD IN NORTH EAST INDIA**

The panel discussion gave rise to several important suggestions which can be summarized as follows:

### **1. Citizen Awareness and Source Segregation**

As per capita consumption is increasing along with growing income in the region, it is important that the citizens are made aware of the ecological impact of their consumption pattern. This would nudge them to be responsible consumers as well as citizens. For instance, manufacturing one kilogram of clothing emits 27.6 kilograms of carbon dioxide. Manufacturing one kilogram of computer parts emits 96 kilograms of carbon dioxide. If such information is provided for every product to consumers, awareness level is sure to increase.

In addition, school curriculums of the North East India States boards must educate children on the subject of circular economy and promote the ecological and environmental benefits of embracing a circular economic growth model.

There is also a need to run a region-wide sensitization campaign emphasizing on the importance of source segregation of garbage at household level. Source segregation is a behavioral change that can become prevalent with raising awareness, sensitization programs, and education.

### **2. Tax Incentives and Financing**

A transition from the linear take-make model to the circular model requires considerable investments in technology, infrastructure, and innovation. The source of these investments can be both the government as well as the private sector. In order to make such investments financially sustainable, the national government needs to fund the state, city, and local governments that seek to build circular economies.

Moreover, the Smart Cities Mission can also incorporate the circular economy model to build a sustainable ecology.

Promoting circular economic practices can also be extended to the private sector by providing special tax incentives. Tax incentives and reduction of carbon foot print have a positive correlation.

Renault, a French car maker uses 33% recycled materials in all its cars in Europe. Such manufacturing in India can be extremely costly and manufacturers may be reluctant in pursuing it without any financial incentive. Companies like ITC, Tata, Mahindra, etc lay a lot of focus on Environment, Social and (Corporate) Governance (ESG) practices as part of their business strategy. If such companies are provide tax breaks or incentives, environmentally responsible and beneficial business will be possible and cost effective in India.

### **3. Policy Roadmap and Co-ordination**

A transition to circular economy requires coordination between the various stakeholders like government organization, civil societies, and the private partners. The central government needs to take the lead in this, and work closely with the various state, city and local governments in developing this comprehensive and implementation focused policy roadmap.

In addition, various other rules issued by the national government, such as the Plastic Waste Management Rules, E-waste Management Rules, Construction and Demolition Waste Management Rules, Metals Recycling Policy, etc., must be aligned with the national circular economy roadmap.

### **4. Knowledge Spillover and Learning by Doing**

Countries around the world are adopting and shifting towards a circular mode of economy. Stakeholders in India can use the existing knowledge of foreign companies (like Renault as mentioned above) by sending capable individuals to these countries. A developing country like India can certainly benefit from such knowledge spillovers. The North East India region could well prioritise in advance in adopting a circular economy approach in managing electrical and electronic wastes (e-waste) in the region due to its rich environmental and natural resource ecosystem and the threats to these due to rising development and digital investments.

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