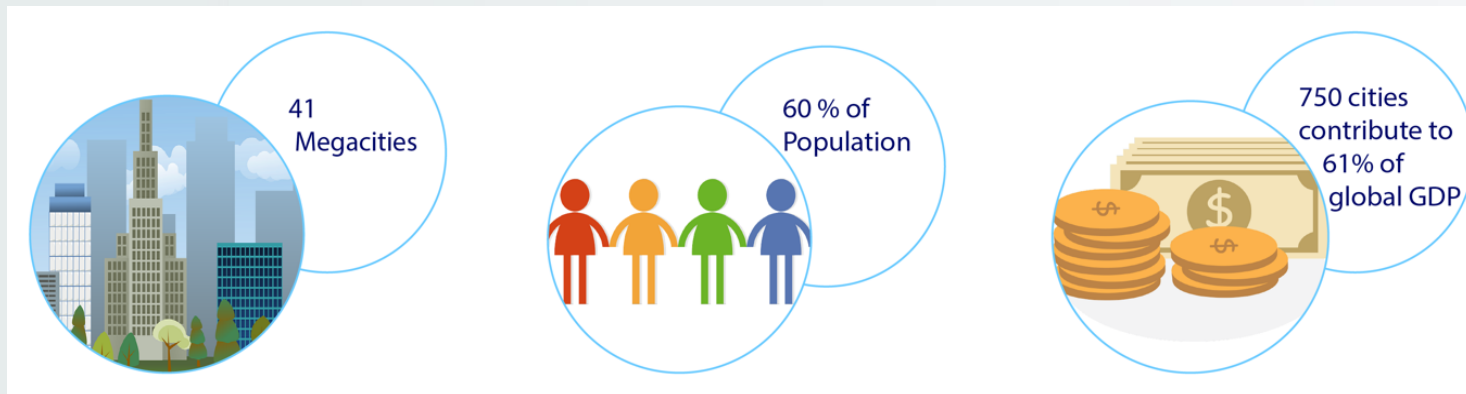


Creating Circular Economic Potential as a way for achieving Smart and Sustainable Cities

Dr. Prasad Modak

Global Urbanisation Trends

- Cities are hubs of growth, innovation and development
- In 2016, about 55% of the global population lived in cities
- Rising cities contribute to rising urban consumption
- 91 percent of growth in consumption in 2015- 2030 period is attributed to large cities



Population Projections for Cities across the Globe- 2030, Source: Oxford Economics, (2014)

Urbanisation in India

Urbanisation in India has been slow, but steady

According to the World Bank, however, by 2050, India will lead world's urban population growth along with China, Indonesia, United States and Argentina

Source: Census of India, 2011

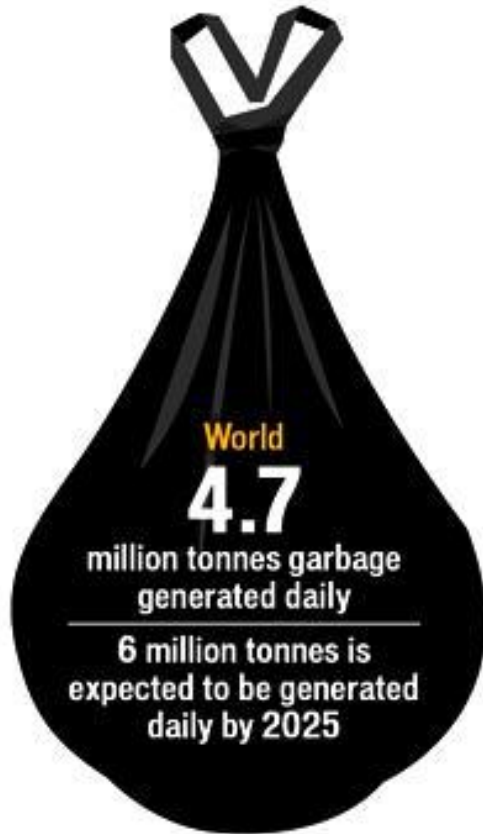


- India has annual urbanisation rate of 2.28 %
- Between 2016 and 2050, India is expected to add 400 million urban dwellers
- Currently five mega cities -Greater Mumbai, Delhi, Chennai, Bengaluru and Kolkata with population of more than 10 million

Waste Management Status

IT'S A DUMP

A look at the waste generated in India and the world



.14

million tonnes garbage generated daily

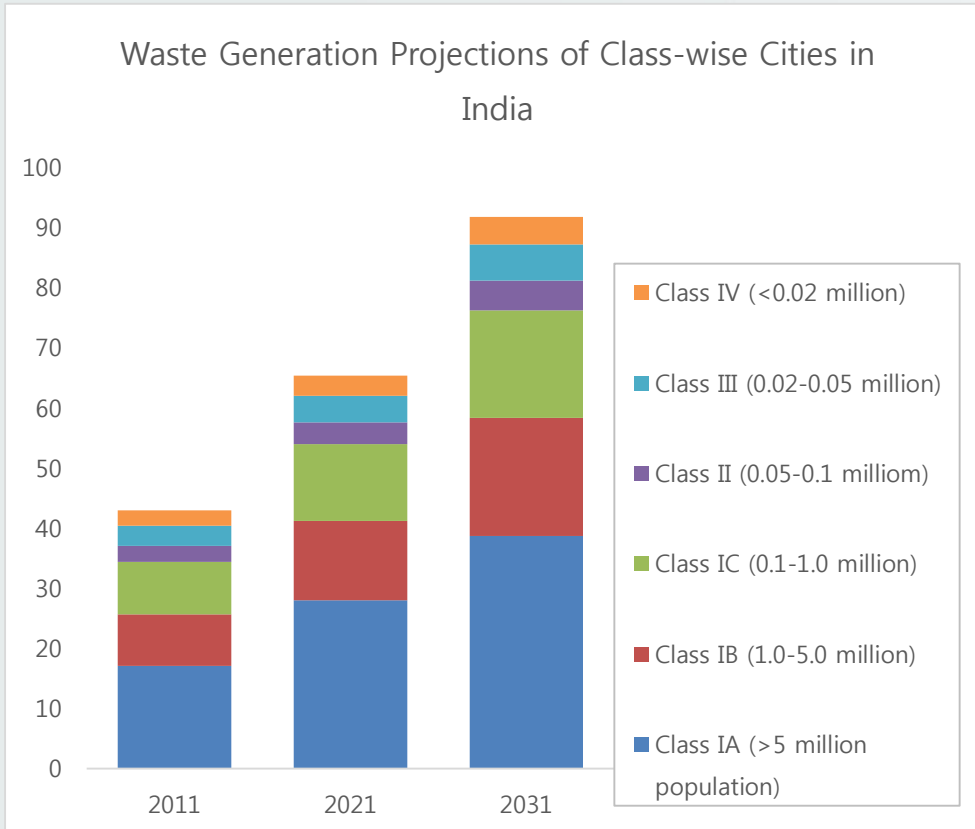
* ALL INDIA AND METRO FIGURES AS ON FEB 2015
* SOURCE: CENTRAL POLLUTION CONTROL BOARD OF INDIA AND CENTRE FOR SCIENCE AND ENVIRONMENT

WHAT A MESS

Of the total Municipal Solid Waste generated in India daily, only 1,17,645 TDP or 83% of what is generated is collected; Only 33,665 TDP or 29% of MSW collected is treated

Source: HT. (2016). Gone to waste: How India is drowning in garbage? <https://www.hindustantimes.com/india/india-s-cities-are-faced-with-a-severe-waste-management-crisis/story-vk1Qs9PJT8I1bPLCJKsOTP.html>

Waste Generation in India



Waste Generation Projections, Source: Jindal (2016) and PWC

- MSW contributes to nearly 80% to the urban waste generation
- Waste generation rate (kg per capita per day) ranges between 0.17 to 0.62 for 48 cities analysed across India
- The projections point out a greater rise in waste generation in class IA and IB cities
- **Need to focus on class IA and IB cities for a proactive integrated waste management**

The Waste Cycle

- Different stakeholders carry out different activities in the cycle
- Smart waste management system entails
 - Efficient method for waste segregation
 - Maximize resource recovery
 - Reduce risks to humans and ecosystems

This requires science-policy based stakeholder involvement



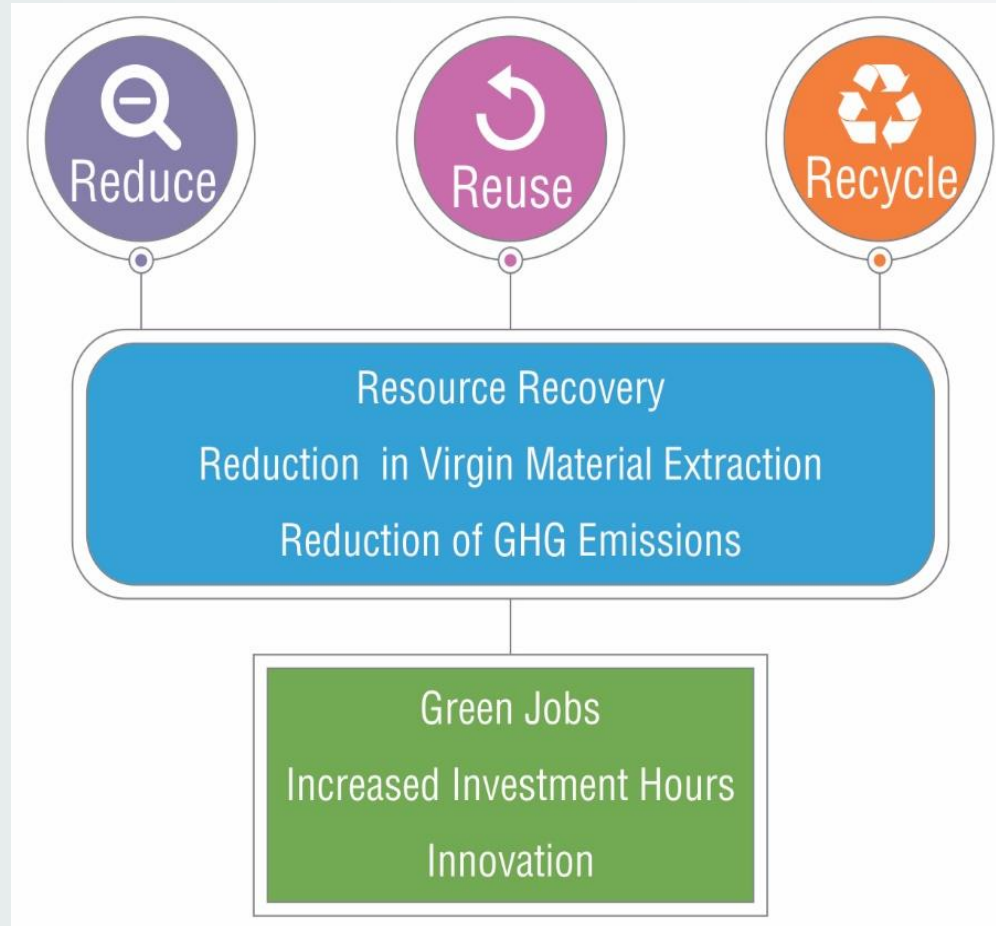
Waste Management Cycle, Source: Waste Life Cycle. (2017). Retrieved from: <http://www.epur.fr/en/environmental-services/>

Science Policy Business Interactions

Stakeholder participation for co-design, co-production and co-implementation of knowledge



3Rs in the Waste Management Infrastructure



3Rs in Policy Frameworks

- Solid Waste Management Rules (2016) of India integrates the 3Rs to the waste management policy
- **Informal sector and the formal sector share the responsibilities in the 3R framework of India**
- Swachh Bharat Mission, a national Programme encompasses a multi-pronged approach to build a clean India
- The Mission aims for 100% waste collection/recycling/treatment in urban areas
- **3Rs form the cornerstones of the Mission**



What is Circular Economy ?

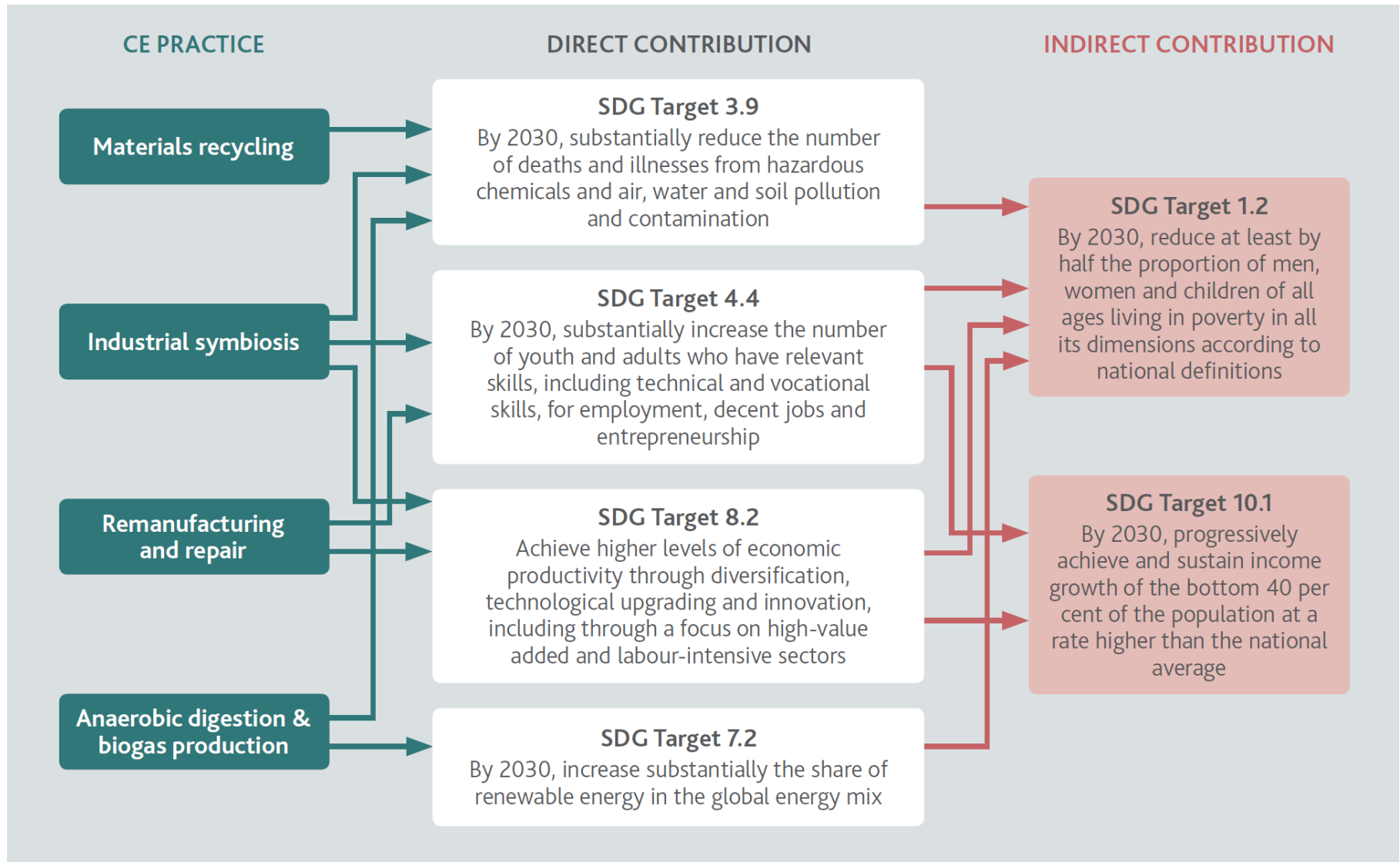
- A regenerative economic system
- **Transition from 'take-make-dispose' models to 'take-make-use-regenerate' resource model**
- A new model for sustainable development and green economies
- Aims to redesign the production and consumption systems
- Emphasis on social, environmental, economic and cultural aspects



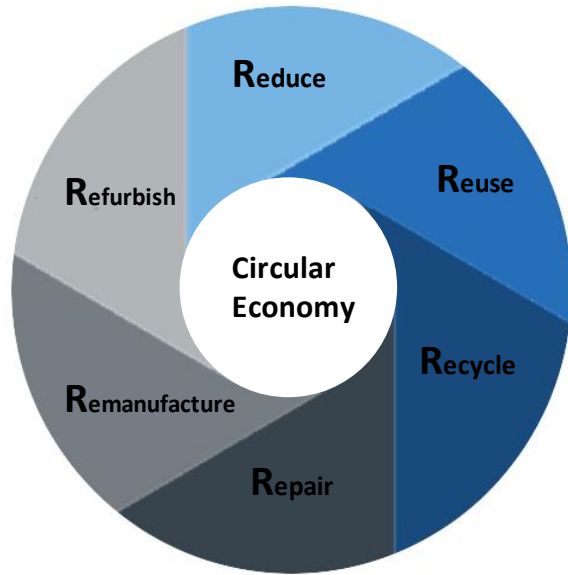
Circular Economy Worldwide



Circular Economy and SDGs



Circularity in Waste Management – 6Rs



Employment Enterprise Innovation Investment

Sustainable Development Goals

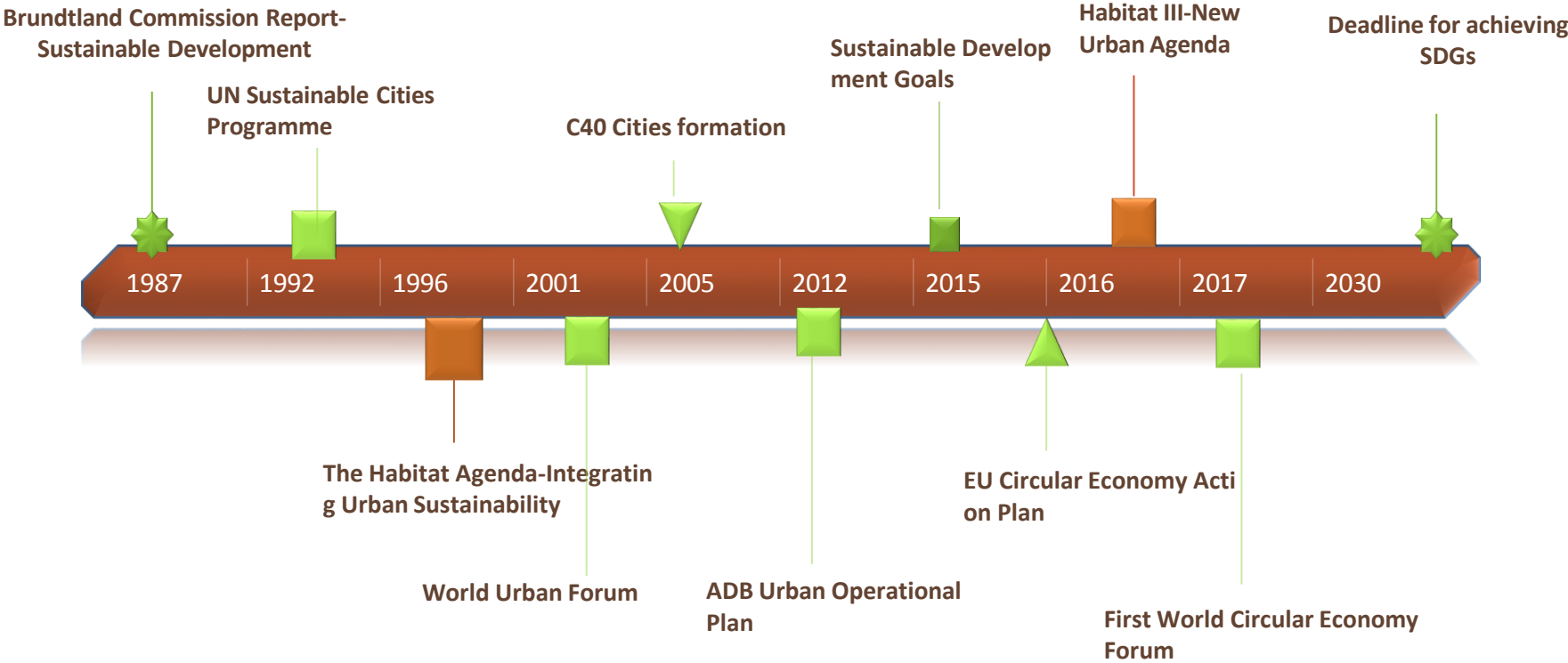
Circular economy models add 3 additional Rs namely- **Repair, Refurbish and Remanufacture**

Repair: This involves restoring the products after end of life and using them for the same purposes

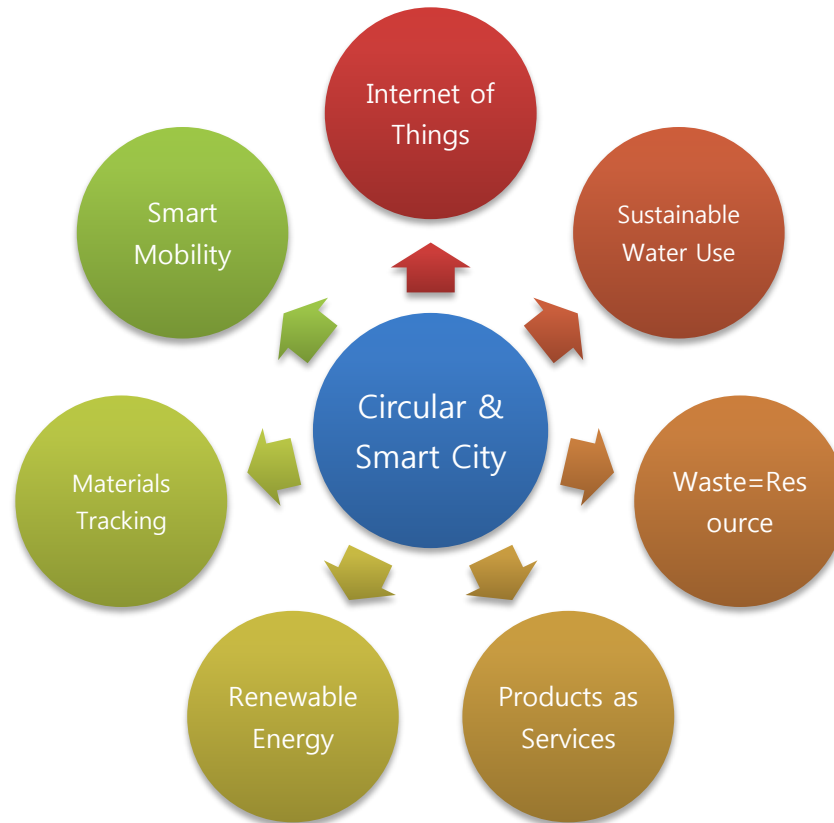
Refurbish: This involves revamping products after their lifetime without losing value

Remanufacture: This involves re-processing already used products for making new products without loss of value

Sustainable Journey of Cities



What are Circular & Smart Cities?



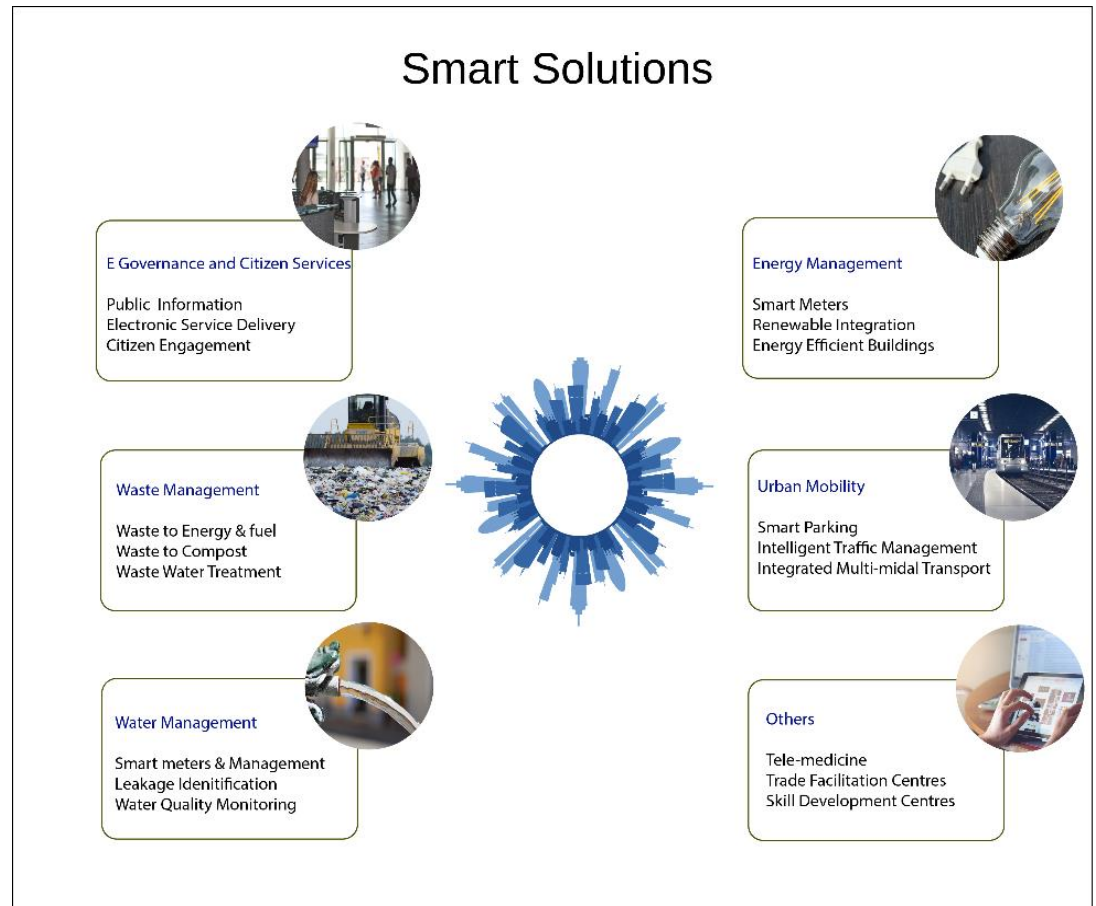
“A smart sustainable city is an innovative city that uses information and communication technologies (ICTs) and other means to improve quality of life, efficiency of urban operation and services, and competitiveness, while ensuring that it meets the needs of present and future generations with respect to economic, social and environmental aspects as well as cultural.”

-UNECE and ITU, 2014

Leveraging smartness for Circular Cities

“Circular cities aim to eliminate the concept of waste, keep assets at their highest utility at all times, and are enabled by digital technology. A circular city aims to generate prosperity and economic resilience for the city and its citizens, while decoupling this value creation from the consumption of finite resources”

Ellen Macarthur Foundation



Smart Waste Management

- India has immense potential for a circular economy transition
- Smart and Circular Cities are inevitable components in India's development trajectory
- Need for decentralised solutions in waste management
- Potential to integrate CE to national missions like Smart Cities Program

Cost savings in GDP
30% by 2050



Material Savings
for Business



Lower GHG emissions
44% lower in 2050



Reduced congestion
& pollution



Leveraging digital
technology

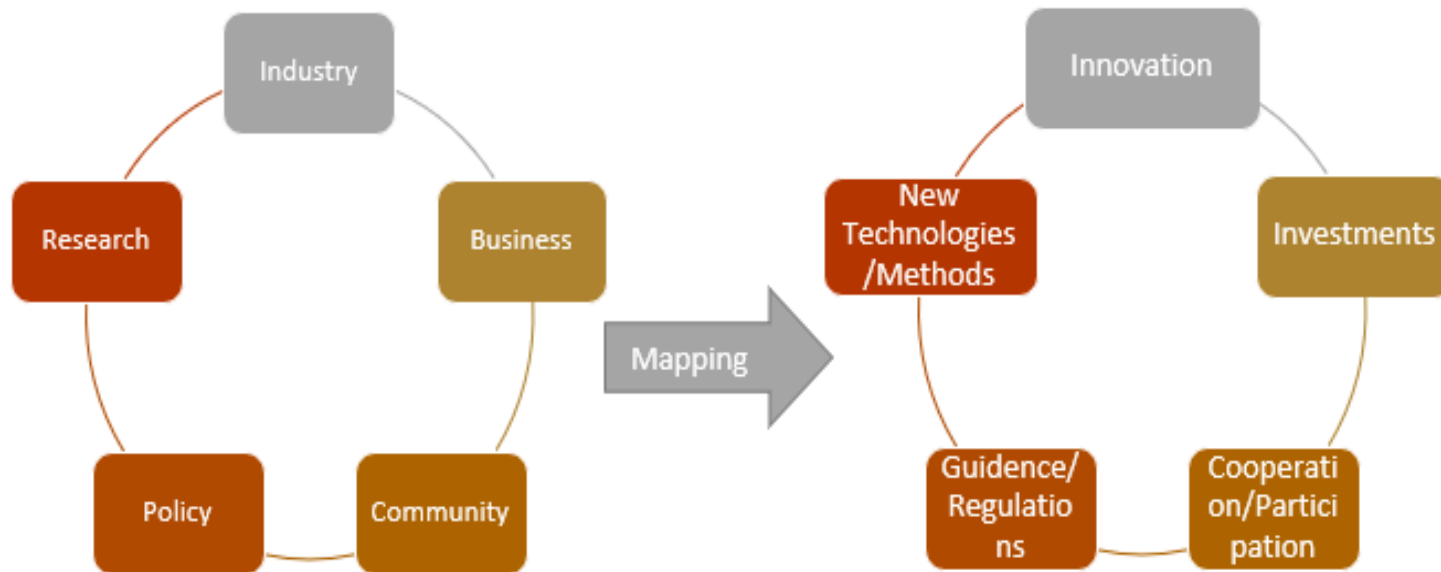


Gain competitive
advantage



Gaps and Missing Links

- Absence of adequate policy-business-science interaction in sustainability sector
- The lack of suitable platforms of interaction and exchange
- Absence of organizational and social innovations pertaining to CE deployment in India
- Need to map the stakeholders to respective actions



Recommendations

1. Awareness and Action towards Compliance should be the priority in Solid Waste Management
2. Integrating 6Rs to local traditions and draw from the existing repair and refurbish culture
3. Cities to strive for innovation, knowledge exchange and partnerships
4. Create platforms that connect science, policy and business at the city level

Recommendations

5. Formulating new business models, testing them followed by nurturing
6. Practicing Green Public Procurement and promoting green entrepreneurship
7. Introducing and supporting Innovative financial mechanisms for supporting circular ventures
8. Build capacities at city and regional levels; with public sector and private sector participation

The Way Forward

The key questions that we need to address are

- How do we introduce the concept of **circularity in the smart cities mission**? How do we develop urban environmental and social management frameworks that guide projects, programs and investments ensuring circularity?
- How do we establish collaborative platforms between government, business and communities that can help in **building partnerships, raise finance, exchange knowledge and spur innovations**?
- How do we build leadership that steers cities towards **smart , circular and sustainable governance**?

Thank You ! Questions ?

