

Study Report on,
CIRCULAR ECONOMY (e-waste and Plastic waste);
SMART CITIES
(Digital, Energy & Transportation);
DATA PRIVACY & CYBER SECURITY

7TH DECEMBER 2023



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Combine Ways | TERI



Seconded European
Standardization
Expert in India



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ACRONYMS

3GPP	3rd Generation Partnership Project
ADITYA	Atal Distribution Improvement Scheme
AFD	Agence Francaise de Development
AMI	Advanced Metering Infrastructures
AMRUT	Atal Mission for Rejuvenation and Urban Transformation
APEC	Asia-Pacific Economic Cooperation
API	Application Programming Interface
ARPA	Advanced Research Project Agency-Energy
ASSOCHAM	Associated Chambers of Commerce and Industry of India
AWMINS	Architecture for Waste Management in Indian Smart Cities
BEE	Bureau of Energy Efficiency
BIS	Bureau of Indian Standards
BPR	Business Process Reengineering
BREEAM	Building Research Establishment Environmental Assessment Methodology
BRTS	Bus Rapid Transit System
BSES	Bharat Stage Emission standards
BSPS	Bus Signal Priority System
BYOD	Bring Your Own Device
CBG	Compressed biogas
CDAC	Centre for Development of Advanced Computing
CE	Circular Economy
CEA	Central Electricity Agency
CEN	European Committee for Standardization
CENELEC	European Committee for Electrotechnical Standardization
cERT-In	Computer Emergency Response Team – India
CI	Critical Infrastructure
CII	Confederation of Indian Industry
CIP	Continuous Improvement Programs

CIPET	Central Institute of Petrochemical Engineering and Technology
CITIIS	City Investments to Innovate, Integrate, and Sustain
CIVITAS	Institute for Study of Civil Society Europe
CMPs	Consent Management Platforms
CO2	Carbon Dioxide
CoSMiC	Common SMart iot Connectiv
CPCB	Central Pollution Control Board
CRM	Critical Raw Materials
CSIR	Council of Scientific and Industrial Research
DGNB	Deutsche Gesellschaft für Nachhaltiges Bauen
DISCOMs	Distribution Companies
DoT	Department of Telecommunications
DPIA	Data Protection Impact Assessment
DRS	Deposit Return System
ECBC	Energy Conservation Building Code
EDM	European Data Market
EDPS	European Data Protection Supervisor
EEE	Electronic and Electrical equipment
EESL	Energy Efficiency Services Limited
EIB	European Investment Bank
eIC	Electronic Informed Consent
eID	European Digital Id
eIDAS	Electronic Identification, Authentication, and Trust Services
EIF4SCC	European Interoperability Framework for Smart Cities and
EIP-SCC	European Innovation Partnership on Smart Cities and Comm
EOL	End of Life
ENCS	European Network for Cyber Security
ENISA	European Union Agency for Cybersecurity
ENS project	Entry Summary Declaration.

EPA	Environment Protection Act
EPIC	European Platform for Intelligent Cities
EPR	Extended Producer Responsibility
ESIWA-ORF	Enhancing Security Cooperation In and With Asia
ESDM	Electronics System Design and Manufacturing
ERDF	European Regional Development Fund
ETNA	European Transport Network Alliance
ETS	Emission Trading System
EVs	Electric Vehicles
ETSI	European Telecommunications Standards Institute
ETSI ISG CIM	European Telecommunications Standards Institute Industry Specification Group on cross-cutting Context Information Management
FAME	Faster Adoption and Manufacturing of Electric Vehicles
FDI	Foreign Direct Investment
FICCI	Federation of Indian Chambers of Commerce and Industry
GDP	Gross Domestic Product
GDPR	General Data Protection Regulation
GIS	Geographic Information Systems
GRIHA	Green Rating for Integrated Habitat Assessment
GST	Goods and Services Tax
HDPE	High Density Polyethylene
HERs	Home Energy Reports
HQE	Haute Qualité Environnementale or High Quality Environmental standard
IAPP	International Association of Privacy Professionals
ICCCs	Integrated Command and Control Centers
ICT	Information and Communication Technology

ACRONYMS

ICT	Information and Communications Technology
IEC	International Electrotechnical Commission
IEC	International Electrotechnical Commission
IFCPAR	Indo-French Centre for Advanced Research
IGBC	Indian Green Building Council
IIT	Indian Institute of Technology
IMF	International Monetary Fund
INEA	Innovation and Networks Executive Agency
INSS	Indian National Strategy for Standardization
IoT	Internet of Things
IPDS	Integrated Power Distribution System
ISGF	India Smart Grid Forum
ISO	International Organization for Standardization
i-STEM	India- Science Technology Engineering and Mathematics
ITDP	Integrated Transport Depots
ITMS	Intelligent Traffic Management System
ITS	Intelligent Transport Systems
ITU	International Telecommunication Union
IUDX	India Urban Data Exchange
JTC 1	Joint Technical Committee
JWG	Joint Working Group
KfW	Kreditanstalt für Wiederaufbau
KYC	Know Your Customer
LEED	Leadership in Energy and Environmental Design
LIBs	Lithium Ion Batteries
LITD 28	Electronics and Information Technology Division
MaaS	Mobility-as-a-Service
MDMS	Master Data Management System

MeiTY	Ministry of Electronics and Information Technology
MoEFCC	Ministry of Environment Forest and Climate Change
MoRTH	Ministry of Road Transport and Highways
MoU	Memorandum Of Understanding
MSSP	Managed Security Service Provider
MSW	Municipal Solid Waste
NASSCOM	National Association of Software and Service Companies
NATRIP	National Automotive Testing and R&D Infrastructure Project
NCMC	National Common Mobility Card
NGSI-LD	Next Generation Service Interfaces-Linked Data
NIELIT	National Institute of Electronics & Information Technology
NIS	Network and information systems
NIUA	National Institute of Urban Affairs
NSGM	National Smart Grid Mission
ODAWS	Onboard Driver Assistance and Warning System
OMCs	Oil Marketing Companies
PAGE-R	Partnership to Advance Clean Energy Research
PAS	Publicly Available Specification
PDP	Prevent-Detect-Protect
PIAs	Privacy Impact Assessments
PM UJALA	Pradhan Mantri- Unnat Jyoti by Affordable LEDs for All
PPP Model	Public-Private Partnership
PRO	Producer Responsibility Organization
ProSUM	Prospecting Secondary raw materials in the Urban mine and Mining waste
PVC	Poly Vinyl Chloride
RBI	Reserve Bank OF India
RED	Renewable Energy Directive
REMOURBAN	REgeneration MOdel for accelerating the smart URBAN transformation

RoHS	Restriction of Hazardous Substance
RPO	Renewable Purchase Obligation
S4AllCities	Smart Spaces Safety and Security for All Cities
SATAT	Sustainable Alternative Towards Affordable Transportation
SCM	Smart Cities Mission
SDG	Sustainable Development Goals
SDIC	Smart Data and Inclusive Cities
SET	Strategic Energy Technology
SNAP	Standards National Action Plan
SNLP	National Street Lighting Programme
SOC	Security Operations Center
SRM	Secondary Raw Materials
SUD	Sustainable Urban Development Strategies
SUP	Single Use Plastic
SWAMP	Sustainable Wetlands Adaptation and Mitigation Program
TCF	Transparency & Consent Framework
TEC	Telecommunication Engineering Centre
TEN-T	Trans European Transport Network
TSDSI	Telecommunications Standards Development Society, India
TSP	Telecom Service Providers
TTC	Trade and Technology Council
UDAY	Ujjwal DISCOMs Assurance Yojana
UDPs	Urban Data Platforms
ULBs	Urban Local Bodies
USG	United States Government
WEEE	Waste from Electronic and Electrical equipment
WFD	Water Framework Directive
WTO	World Trade Organization

FOREWORD

The SESEI project (Seconded European Standardization Expert in India) is a project co-funded by five European partners (EC, EFTA, CEN, CENLEC & ETSI), operating from New Delhi, India, with the objective to increase the visibility of European standardization in India and to promote EU/EFTA-India cooperation on standards and related activities.

The SESEI's mission is to enhance the visibility of European standardization activities, increase the cooperation between Indian and European standardization bodies and support European companies facing standardization related issues hampering market access to India

The project supports the cooperation between India and Europe in standardization related aspects, by identifying all potential opportunities for enhanced international cooperation and global harmonization of standards. Ultimately, the SESEI project aims at reducing the Technical Barriers to Trade (TBT) both between EU/EFTA and India and globally, thus supporting European and Indian industries by facilitating international trade.

SESEI project through its experts focuses mainly on the following priority topics, while also keeping a track and extending possible support to both EU/EFTA and India on the topics of WTO-TBT and Market Access, IPR, R&D and Innovation, National Manufacturing Policy: Make in India, EU-INDIA FTAs, etc.

- Digitization: Strategic technologies, digital governance, and digital connectivity:
- Smart Cities/Urban Development, ITS, Quantum Technologies, Smart Grid/Meter, Artificial Intelligence, 5G/6G, Open RAN, M2M/IoT (Cyber-Physical Systems), DECT, Data Privacy, Satellite Communication, Blockchain, Digital Signature, Smart Manufacturing, e-Accessibility, cybersecurity, digital skills, digital platforms including Research and Innovation etc.
- Green & Clean technologies : Clean Energy, Energy Efficiency (Green ICT), Environment, Circular Economy including Resource Efficiency, Waste Management, Energy storage technologies, Electric mobility, Green Hydrogen, Advanced biofuels including R&I etc.

This Study Report on “CIRCULAR ECONOMY (e-waste and plastic waste), SMART CITIES (Digital, Energy & Transport) & DATA PRIVACY AND CYBERSECURITY is commissioned to determine the sector profile, market dynamics, current state & future potential, gaps, challenges and key recommendations for India-EU/EFTA collaboration, covering standards development & policy initiatives in India and EU/EFTA to support the sectorial growth.

With this study report and through further deliberation on it at the “EU/EFTA India Conference on Standards & Emerging Technologies” scheduled for 7th December 2023 at The Lalit New Delhi, Project SESEI aims to determine list of actions as a way forward which shall further support Project SESEI in achieving its objective and strengthen the cooperation and collaboration between EU/EFTA and India.

BACKGROUND AND OBJECTIVES



India remains the world's fastest-growing economy, per the IMF, with projected growth of 6.1% in 2023 and 6.8% in 2024, driven by domestic demand and government initiatives such as financial system development, forward-looking policies, infrastructure improvement, and relaxed FDI norms. India is also working on enhancing its trade, quality infrastructure, and standards through initiatives like the INSS, SNAP 2022, and updates to BIS ACT, Rules, and Conformity Assessment regulations.

India is concurrently transitioning towards digitalization and sustainability, emphasizing innovation and technology growth through initiatives like Smart Cities, which is dedicated to reducing the carbon footprint and fulfilling the SDGs commitments while addressing cybersecurity concerns with the "Digital Personal Data Protection Bill."

The 60-year-old EU-India relationship spans socio-economic issues, multilateralism, rules-based order, and security cooperation. India and the EU/EFTA have developed frameworks for clean energy, climate cooperation, and connectivity, which are evolving under the Roadmap to 2025. These frameworks cover digital technologies, renewable energy, circular economy, and energy efficiency. The Trade and Technology Council (TTC) solidifies their strategic partnership, focusing on digital governance, clean energy, resilient value chains, trade, investment, and innovation for SDGs. Standards play a crucial role in these strategic technologies and sectors.

This report is meant to be a comprehensive overview, a prediction of the future, a deep analysis of upcoming digital, smart city, data privacy and cybersecurity concepts interlinked with India and EU/EFTA.

EXECUTIVE SUMMARY

In the pursuit of fostering inclusive economies and societies through human-centric Digitalization and Green & Clean Technologies, India and the European Union (EU/EFTA) stand at the forefront of global standards advancement. United by common objectives, many collaborative initiatives span various sectors crucial for smart city development, circular economy and cybersecurity. This report encapsulates the key aspects of this collaborative journey, focusing on market dynamics, future potential, policy standardizations, and identified gaps and challenges.



Trade and Investment Potential:

- **Burgeoning Trade and Investment:** India is the world's fastest-growing large economy, with the EU/EFTA as its top trading partner in 2017, resulting in €86 billion in goods trade and €29 billion in services. There are untapped opportunities for further trade liberalization and expanded investment conditions that could unlock tremendous potential.
- **Investor Confidence:** The EU/EFTA is a significant investor in India, with over €72 billion in investments, while India is increasingly investing in the EU/EFTA, totaling €4.9 billion in 2016. Expanding these investments holds untapped potential for mutual benefits.
- **Employment Opportunities:** Over 6,000 EU/EFTA companies provide direct employment to 1.2 million Indians and indirect employment to 5 million. Realizing the full potential of job creation and fostering economic growth remains an untapped opportunity.



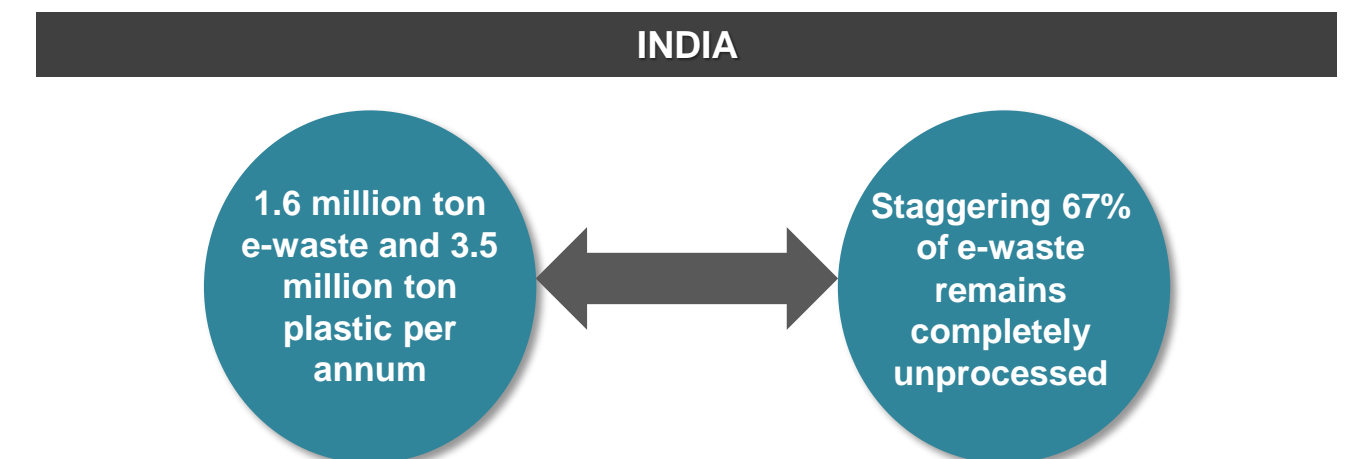
CIRCULAR ECONOMY

Waste Management in INDIA



Being an emerging economy with a rapidly growing Gross Domestic Product (GDP), India is the third largest consumer of raw materials produced globally and estimated to consume nearly 15 billion tones of material by 2030 with the current economic trends. India's Electronic and Electrical Equipment (EEE) manufacturing is dependent on high material consumption with metals like Iron, copper, silver, gold, aluminum, manganese, chromium and zinc along with various rare earth elements. Rate of extraction of these abiotic resources for EEE manufacturing is significantly higher than the rate of their formation in nature. CE approach will thus be imperative to fulfil the resource needs for the country in this sector. EEE waste is considered as one of the rich sources of secondary raw materials and can contribute towards resource security and environmental sustainability.

In 2021, the Indian EEE industry is forecasted to grow at a 16.6% CAGR to reach € 507.6 billion in 2025. Currently informal sector dominates the EOL management of e-waste in India, considering these numbers a lot of skilled labour would be required along with raw materials for such growth. Active presence of ULBs and private blended financial models can enable the formalization of some of the ragpickers in the sector.



EXECUTIVE SUMMARY

Waste Management in EU/EFTA

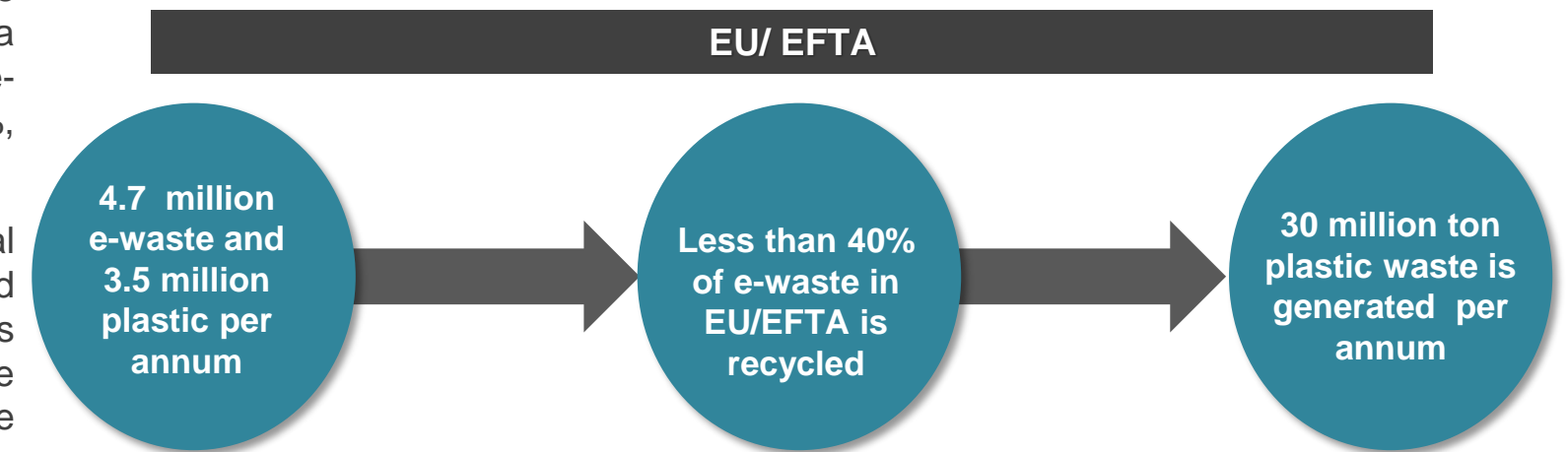


Circular Economy (CE) is a development priority in the EU/EFTA, integrated into its industrial plan. While waste management in the region is advanced, e-waste is a rapidly growing stream, with the EU/EFTA ranking first globally in per capita e-waste generation. Recycling practices vary, with Croatia leading at 81%, contrasting with Malta's 21%.

Plastic Waste Challenges: Plastic waste, a critical concern, demands equal attention for circular economic principles. A significant portion of globally produced plastic is lost from the value chain, with potential resource scarcity. The focus should shift towards identifying and using plastic alternatives to mitigate environmental impact. Circular economy efforts in plastics should aim to reduce demand and production by slowing the material loop.

Plastic Waste Management in India: India faces challenges in managing plastic waste due to its large population and growing economy. The country is projected to lose over €125.02 billion of plastic material in the next decade. While some secondary applications exist, such as road construction and waste-to-energy plants, these are limited compared to the volume of waste generated.

EU/EFTA's Plastic Recycling Landscape: In the EU/EFTA, the mounting plastic issue is seen as a problem of overproduction or poor production design. Despite claiming to be one of the highest plastic recyclers globally, only 10% of plastic in the EU/EFTA is recycled. The increased production of recycled plastic is outpaced by the rise in virgin plastic. Stricter regulations and import bans in Asia have reduced plastic waste exports from 10% in 2010 to 3%, necessitating the EU/EFTA to manage its own waste. Different countries within the region exhibit varying levels of plastic waste generation, with Belgium and Italy producing the highest amounts of sorted plastic waste. However, it remains unclear whether their overall plastic consumption is high or if household segregation practices contribute to the observed patterns.



Circular Economy (CE) Potential in E-Waste and Plastic Sectors



There is substantial potential for incorporating CE principles in the e-waste and plastic sectors in both India and the EU/EFTA, spanning different stages of the product value chain.

EU/EFTA's ProSUM Project: The EU/EFTA's ProSUM project serves as a global urban mining knowledge center, offering valuable insights for addressing e-waste challenges. The project exemplifies effective strategies for dealing with electronic waste and provides a platform for global learning.

CENELEC Standards in EU/EFTA: CENELEC has established comprehensive standards covering major aspects of e-waste and plastic waste management in the EU/EFTA region. These standards contribute to the development of effective practices and guidelines for managing electronic and plastic waste.

Extended Producer Responsibility (EPR) in India: The introduction of Extended Producer Responsibility (EPR) under e-waste and plastic waste rules has been transformative for waste management in India. This paradigm shift places the responsibility for waste on producers, marking a significant development in the Indian waste management system.

Consumer Culture and Recycling in India: Beyond legal frameworks, India boasts a consumer culture with an inherent tendency to reuse and recycle. This cultural inclination towards sustainability is a notable aspect that the EU/EFTA can learn from and potentially adopt to enhance recycling practices.

Consumer Perception in EU/EFTA: In the EU/EFTA, a preference for high-quality products might create a challenge in adopting products with secondary or recycled materials. Overcoming this mental block is crucial for fostering a circular economy, and insights from India's recycling culture could offer valuable perspectives.

EXECUTIVE SUMMARY



CONNECTIVITY IN SMART CITIES (DIGITAL | ENERGY | TRANSPORT)

The smart city market in India, valued at €5.92 billion in 2022, is poised for remarkable growth with an anticipated 25.2% CAGR from 2023 to 2031, targeting a valuation of €43.5 billion by 2031. Simultaneously, the EU/EFTA anticipates robust growth, with a projected market revenue of €23.31 billion in 2023 and an expected CAGR of 12.42% from 2023 to 2028, reaching €41.86 billion by 2028.

Collaborative potential is evident through initiatives like the India-EU/EFTA Smart Grids Partnership, India-EU/EFTA Green Grids Initiative, and Smart Cities India-EU/EFTA Partnership. Policy standardizations align India's initiatives with the EU/EFTA's Digital Agenda and Circular Economy Action Plan, fostering synergies in waste management, water, lighting, safety surveillance, and urban planning. The EU/EFTA's European Green Deal focuses on urban mobility, interconnected rail networks, and autonomous vehicles.

Shared challenges include high costs, low awareness, and incoherent national-level policies, addressed through collaborative efforts such as knowledge exchange, joint research, policy dialogues, and capacity-building. Initiatives like the EU/EFTA-India Energy Dialogue and the India-EU/EFTA Hydrogen Partnership underscore this collaborative approach.

Projects like [Swachh Bharat Abhiyan](#) and [Smart Meter Lighting](#) in India align seamlessly with EU/EFTA initiatives like Horizon 2020 Projects, fostering synergies that transcend geographical boundaries. The collaborative efforts extend to smart waste management R&D, joint development of IoT-enabled waste management, AI projects, and recycling initiatives.

In essence, this executive summary outlines the promise of a robust India-EU/EFTA collaboration, envisioning smarter, sustainable, and resilient cities for the future. Integrated policies, project-specific synergies, and collective problem-solving define this collaborative journey, shaping the future of smart cities beyond traditional boundaries. The summarized insights offer a comprehensive understanding of the collaborative potential between India and the EU/EFTA in smart city development.

Digital Connectivity and Smart City Initiatives: A Comparative Overview

INDIA INITIATIVES

- **Data Smart Cities Strategy (DSC) (2015):** Aims to establish 100 Smart Cities with open data portals.
- **Smart Cities Open Data Portal (2020):** Facilitates collaborative data sharing among cities for transparency.
- **Data Maturity Assessment Framework (DMAF) (2019):** Assesses cities' data maturity for strategic data management.
- **City Data Policy (CDP) and City Data Officer (CDO):** Play crucial roles in shaping and enforcing city data management policies.
- **National Smart Grid Mission:** Focuses on modernizing the electricity grid through renewable integration and decentralization.
- **Energy Conservation Building Code (ECBC):** Ensures standardized features in buildings for energy efficiency.
- **One Nation One Card:** Facilitates connected multimodal transportation in Indian cities.
- **Intelligent Traffic Management System (ITMS):** Implemented in several Tier 1 and Tier 2 cities for efficient traffic management.

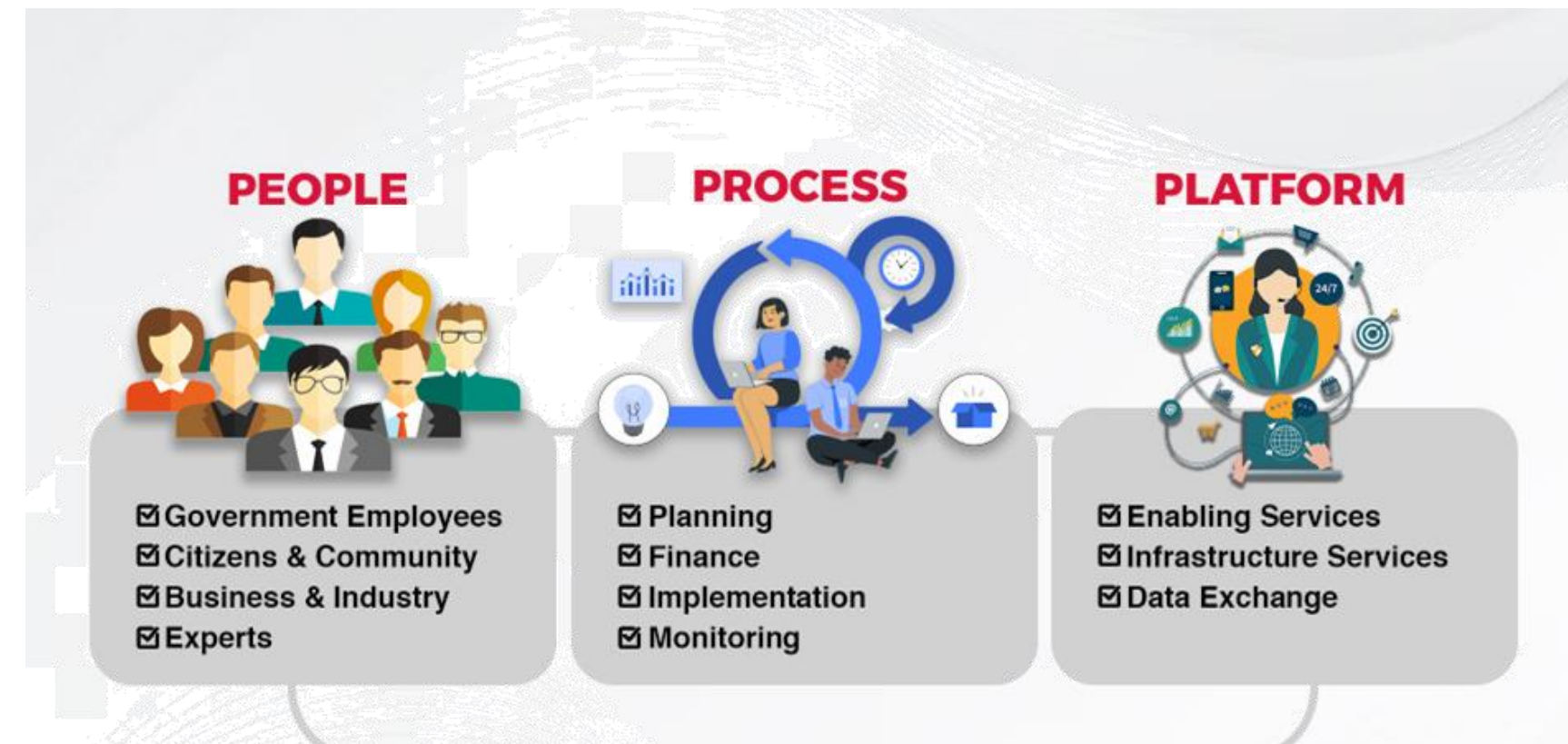
EU/ EFTA INITIATIVES

- **Living-in.EU Movement (2019):** City-led platform accelerating digital transformation.
- **Interoperable Local Data Platforms:** Key feature promoting seamless data integration across city systems.
- **Data Space for Smart Communities Initiative (2022):** Aims to facilitate data sharing through a dedicated space.
- **Local Digital Twins (2022):** Focuses on building city capacity for innovative digital frameworks.
- **Strategic Energy Plan (SET) and 'Clean Energy for All':** Promotes smart grids and intelligent energy management.
- **Renewable Energy Directive:** Sets a target of 42.5% renewable energy integration in the European grid by 2030.
- **Seamless Multi-Modal Transportation:** Introduces dynamic pricing models, real-time traffic management, and e-mobility infrastructure expansion.

EXECUTIVE SUMMARY

Shared Cooperation between India and EU/EFTA may include:

- **India's AWMINS Project:** Utilizes IoT for smart waste bin management.
- **Smart Meter National Programme:** Aims to retrofit 250 million conventional meters with smart variants for energy efficiency.
- **SAAR Initiative and AMRUT Mission:** Focus on efficient water management aligning with the broader Smart City Mission.
- **EU's SCALS Project:** Commits to adaptive urban smart lighting for efficient public lighting management.
- **SLUDGE 4.0 Project:** Innovates solid waste collection and processing.
- **Innovating Cities Initiative:** Aims to transform 100 EU cities by 2030.
- **Thales Group's Security Digital Platform:** Utilizes big data, AI, and cybersecurity for enhancing safety and security infrastructure.



The parallel efforts of India and the EU/EFTA signify a shared commitment to leveraging smart connectivity for holistic smart city development. Both regions showcase innovative projects, policy frameworks, and initiatives addressing key urban challenges and fostering sustainable urban living. The EU/EFTA could collaborate with India's **Smart Meter Rollout** and smart city initiatives, while India can collaborate with the EU's cutting-edge projects like **SCALS** and **mySmartlife**. Joint efforts in deploying smart LED lighting, implementing **Advanced Metering Infrastructure (AMI)** and **Outage Management System (OMS)**, and developing AI applications for smart cities are pivotal for mutual growth and sustainability. Emphasizing collaboration in R&D projects, learning from each other's successes, and collectively contributing to the advancement of smart urban development underscore the potential of the India-EU/EFTA partnership. In the rapidly evolving landscape of urban development, the collaboration between India and the European Union (EU) in building digital connectivity for smart cities is pivotal. The initiation of the Internet of Things (IoT) Policy in India, with its five vertical pillars and overarching supports, lays the foundation for comprehensive digital integration.

India has undertaken significant initiatives to propel its smart city development agenda, notably through the **CITIIS 2.0 project**. This initiative, managed by the **National Project Management Unit (PMU)** at the National Institute of Urban Affairs (NIUA), focuses on providing on-site guidance, capacity building, and peer-to-peer learning for effective implementation. The National Urban Learning Portal (NULP) further augments India's commitment to creating a knowledge-sharing platform for city managers and stakeholders, fostering innovation in data-driven urban planning.

On the other hand, the EU/EFTA stands at the forefront of innovative urban planning, as evident in initiatives like the **Innovating Cities initiative**. Aimed at *transforming 100 cities* to climate neutrality by 2030, this initiative explores AI applications in smart cities, shaping sustainable urban development. Thales Group, a key player, enhances city efficiency through integrated transport, safety, and security infrastructure, employing a Security Digital Platform with big data, AI, and cybersecurity. The Smart Cities Adaptive Lighting System (SCALS) showcases the EU/EFTA's commitment to adaptive urban smart lighting. Collaborations with India include initiatives such as creating a platform for sharing best practices, experiences, and technologies, contributing to the global evolution of smarter and more sustainable cities.

Recommendations include establishing collaborative networks at regional levels, appointing officers for urban data, and forming a **Data Analytics and Management Unit (DAM Unit)** to ensure the effective implementation of the **DataSmart Cities** strategy. The collaborative efforts between India and the EU/EFTA signify a transformative journey toward sustainable and technologically advanced smart cities.

EXECUTIVE SUMMARY

The collaboration between the European Union (EU/EFTA) and India has evolved into a comprehensive partnership, particularly in the Information and Communication Technology (ICT) sector. Key initiatives, including the **EU/EFTA-India ICT Dialogue**, **India-EU/EFTA Joint ICT Working Group**, **Project SESEI** have been pivotal in fostering dialogues on digital connectivity, information technologies, and pertinent policy matters. These engagements reflect a longstanding commitment to exploring innovative approaches and shared solutions in the realm of smart cities.

- **Joint Working Groups on Urbanization:** The collaboration extends to urbanization, with the formation of the India-EU/EFTA Joint Working Groups on Urbanization. Stemming from a joint declaration in 2017, these groups emphasize sustainable urban development and smart cities, underlining the significance of technology exchange and collaboration. The working groups serve as platforms for sharing best practices, focusing on sustainable urban planning, governance, and technology-driven smart city solutions.
- **Trade and Technology Council (Brussels, May 2023):** In the recent Trade and Technology Council, India and EU/EFTA established three working groups, with one dedicated to Strategic Technologies, Digital Governance, and Digital Connectivity. This working group concentrates on crucial aspects such as digital connectivity, AI, 5G and 6G, quantum computing, semiconductors, cloud systems, cybersecurity, digital skills, and digital platforms. These collaborative endeavors showcase a commitment to advancing digital connectivity, shaping the future of technology, and fostering innovation in both regions. Project SESEI presence in India will help strengthening this cooperation in Standards & Policy as the engagement continues and evolve further.
- **BIS, TSDSI & TEC Standards Development:** The Bureau of Indian Standards (BIS) and the Telecommunications Standards Development Society (TSDSI), Telecommunication Engineering Centre (TEC) under Department of Telecom etc, are playing an instrumental roles in setting standards for M2M/IoT and Smart Infrastructure. These organizations maintain dedicated working groups focused on formulating standards, contributing to the harmonization of global standards and promoting compatibility, interoperability, scale, and affordability in the digital landscape. With the presence of Project SESEI in India, these Indian organization are working closely with its EU/EFTA partners such as CEN-CENELEC-ETSI along with European Commission (EC) and European Free Trade Association (EFTA)

The report concludes with forward-looking recommendations, emphasizing collaborative research and development in smart waste management, water, meter lighting, public safety surveillance, and urban planning. Specific projects like India-EU/EFTA Smart Grids Partnership, India-EU/EFTA Green Grids Initiative, and Smart Cities India-EU/EFTA Partnership highlight the potential for impactful collaboration. The Startup Europe India Network (SEINET) continues to advise on scaling up tech firms and issues related to venture capital, impact innovation, and investment sourcing in European and Indian markets.



DATA PRIVACY AND CYBERSECURITY

The cybersecurity market in India is poised for expansion, driven by increased mobile device usage, secure authentication practices, and shifts in antivirus software. The Indian government's prioritization of cybersecurity, formation of task teams, and collaboration with the USG underscore the commitment to secure digital landscapes. However, the absence of comprehensive data protection legislation in India emphasizes the need for user empowerment and personal data rights. India's strategic approach aligns with the goal of achieving a €0.94 trillion digital economy by 2025.

India can tap into the EU's cybersecurity expertise to refine national policies and attract investments, especially from the EU/EFTA. Collaboration is envisioned in shaping new frameworks for eIDAS and digital ID wallets. Cross-border data transfer agreements and a common data protection certification scheme are in the pipeline, promising enhanced cybersecurity and privacy standards through joint efforts. Some of the important **Policies and their Standardization Initiatives** include:

India: Personal Data Protection Bill (2023): Regulates digital personal data processing; **Digital India Initiative (2023):** Covers cybercrime, data protection, and online safety; **National Digital Health Mission (2020):** Connects patients and practitioners digitally; **National Cyber Security Strategy (2020):** Ensures a safe cyberspace; **Reserve Bank Of India (2018):** Equalizes security frameworks for banks; **Data Localization Initiative (2018):** Proposes data localization measures; **Cyber Swachhta Kendra (2017):** A platform for cleaning computers of viruses; **National Cyber Security Policy (2013):** Facilitates secure computing environment.

EXECUTIVE SUMMARY

EU/EFTA: ENISA (2023): Develops cybersecurity certification schemes; **ENCS (2023):** Shares knowledge between security officers; **Cyber Solidarity Act (2023):** Improves response to cybersecurity incidents; **Cyber Resilience Act (2022):** Establishes cybersecurity requirements; **NIS2 (2020):** Protects critical organizations from cyber threats; **Cyber Security Act (2019):** Improves protection against cybersecurity threats.

Cooperation Opportunity includes:

- **Data Encryption Standards:** Collaboration on standardization through international organizations (ISO, IEC); Enhances data security, reduces costs, and promotes interoperability.
- **Secure Authentication Frameworks:** Collaborative development of secure authentication standards; Joint education, outreach campaigns, and government regulations.
- **Data Breach Response Plans:** Identification of best practices for data breach response; Common tools and resources for standardized response strategies.
- **Privacy Impact Assessments (PIAs):** Adoption of international standards (ISO/IEC 29134); Joint project for a common PIA template.
- **Consent Management Frameworks:** Joint initiatives involving experts, technical standards, research, and innovation.
- **Identity Protection Protocol:** Pilot projects to test and demonstrate identity protection protocols.

The collaboration between India and the EU/EFTA presents opportunities and challenges. There is a need for collaborative insights on GDPR and DPDB, emphasizing a shared understanding of data protection laws. Focus should be placed on establishing common data encryption standards, necessitating joint efforts to ensure a robust cybersecurity framework etc. Joint frameworks for encryption and certification are essential, requiring alignment to bolster security measures. The prioritization of collaboration for secure authentication mandates a collective approach to strengthen cybersecurity practices. Both parties must work on shared data breach response standards to streamline compliance with laws in both regions. The development of a customized Privacy Impact Assessment (PIA) and collaboration on consent management frameworks are critical steps. Joint initiatives for identity protection protocols are imperative to establish unified standards. The mutual recognition of data protection standards for cross-border data transfers is a shared challenge and opportunity for both India and the EU/EFTA.

India is at the forefront of groundbreaking research and development in identity verification, showcasing significant strides in various domains. Initiatives such as robust SIM card seller ID verification, the New DigiLocker program, and advancements in KYC facilitated by the RBI Innovation Hub highlight the nation's commitment to secure and streamlined identity verification processes. The Aadhaar ecosystem has seen enhancements, complemented by initiatives like e-KYC infrastructure and projects such as NPR and APAAR, contributing to a comprehensive and secure identity verification landscape. In the realm of cybersecurity, India has made noteworthy efforts, particularly in the development of e-governance infrastructure, UPI integration, blockchain authentication, and extensive awareness campaigns to bolster digital security.

The European Union (EU/EFTA) underscores its commitment to secure digital identity solutions through strategic frameworks and initiatives. The eIDAS Regulation establishes a robust framework for electronic identification and authentication, emphasizing security, interoperability, and reliability. The MyData framework, EBSI, European Digital Identity Wallet, and the Self-Sovereign Identity (SSI) initiative via the ESSIF project collectively reflect the EU's dedication to fostering secure and user-centric digital identity solutions. In the realm of cybersecurity, the EU/EFTA adopts a proactive stance, as evidenced by the NIS 2 directive, which outlines essential cybersecurity measures. The EU/EFTA also implements consent management frameworks, formulates comprehensive data breach response plans, and adheres to stringent cross-border data transfer standards, reinforcing its commitment to safeguarding digital assets and privacy.

India, recognizing the transformative impact of digital technology, has strategically positioned itself to address emerging cybersecurity challenges. The Cybersecurity Opportunity Initiative Framework serves as a comprehensive strategy, integrating policies, human capital development, research, innovation, technology, clusters, and financing. In a forward-looking approach, the nation emphasizes governance and Continuous Improvement Programs to counter evolving cyber threats. The ongoing susceptibility to cyber threats, despite significant investments, underscores the need for continual vigilance. Collaborative efforts between India and the EU/EFTA aim to pool expertise, share best practices, and collectively address shared challenges, enhancing overall cybersecurity.

The EU/EFTA, amidst rapid digital adoption, employs the Cybersecurity Opportunity Initiative Framework, acknowledging the multi-faceted nature of cybersecurity challenges. With a focus on governance and continuous improvement, the EU/EFTA seeks adaptive strategies to counter emerging threats. The discussion on digital adoption's impact on organizational revenue highlights the increasing reliance on digital platforms. Persistent cyber threats, including ransomware and supply chain attacks, necessitate adaptive security measures. Recognizing the critical role of governments in cybersecurity governance, the EU/EFTA advocates for public awareness and cross-border collaboration with India, fostering a cyber-resilient society.

EXECUTIVE SUMMARY

The APEC Cybersecurity Working Group fosters cooperation among APEC member economies, concentrating on incident response, supply chain security, and critical infrastructure protection. The Cybersecurity Capacity Building Initiative (CCBI), a joint effort involving the United States, Japan, Australia, and India, assists in building cybersecurity capabilities in developing countries within the Indo-Pacific region.

In India, to address the scarcity of cybersecurity experts, innovative recruitment and training strategies are essential, requiring collaborative efforts in Indian bodies from the Ministry of Communications (MoC), Ministry of Electronics and Information Technology (MeiTY), Ministry of Education (MoE), and the private sector to establish a comprehensive framework for cybersecurity capacity building. On the other hand, in the EU/EFTA, the Data Governance Regulation (DGR), adopted in 2022, establishes a robust framework for data governance and protection, aiming to promote responsible data processing practices and enhance user control over personal data.

- The EU/EFTA-India Cyber Dialogue (2015) fosters cooperation in data protection, cybercrime prevention, and critical infrastructure. The EU/EFTA-India Joint Working Group supports these efforts through joint exercises, training programs, and information sharing.
- The EU/EFTA-India Joint Declaration (2020) promotes a shared vision on data protection, cybersecurity standards, and a trusted digital ecosystem. The EU/EFTA-India ICT Standardization Collaboration (2020) with Indian stakeholders including Project SESEI aligns data privacy and cybersecurity standards.
- The Budapest Convention on Cybercrime (2001) establishes a legal framework for international cooperation.
- The EU/EFTA-India Trade and Technology Council (2022) is a platform for discussions on trade, technology, cybersecurity, data privacy, and the digital economy. Key policies include Privacy and Data Protection Considerations in Bilateral Agreements (2021) and Capacity Building and Technical Cooperation in Cybersecurity (2020).
- The EU/EFTA-India Cyber-Cooperation Centers initiative (2018) and The India-EU/EFTA Joint ICT Working Group align with the EU's vision for a resilient digital future. The India-EU/EFTA Joint ICT Working Group covers AI, digital platforms, data governance, cybersecurity, and networks. The India-EU/EFTA Cyber Dialogue explores internet governance, UN cyber diplomacy, regional cooperation, capacity-building, and emerging cyber technologies.

India's cybersecurity training landscape is robust with initiatives such as BSNL's nationwide training centers and MTNL's profitable ICT-related services. Noteworthy contributions from C-DOT align with national missions, emphasizing self-reliance. Mission Karmayogi, launched in 2020, focuses on creating future-ready civil servants. The NICF's Capacity Building & Skill Development Program underscores telecom sector skill enhancement. TCIL's women empowerment initiatives highlight diversity in skill development.

Mentioned below are several government-led initiatives, platforms, and legislative measures serve as drivers for fostering collaboration between India and the EU/EFTA in the domains of Circular Economy, Smart City Connectivity (Digital, Energy, Transport), and cybersecurity. These strategic efforts lay the groundwork for a robust partnership, paving the way for mutual growth and innovation in key sectors.

- NASSCOM serves as a pivotal platform for fostering collaboration between Indian and EU/EFTA smart cities. The key areas of focus include Knowledge Exchange, where best practices are shared between the two regions, and Norm Coordination to discuss open, secure internet norms, reducing reliance on global tech. Digital Resilience initiatives aim to enhance the digital economy, promote innovation, and foster research and partnerships. The Tech Innovation Showcase encourages innovation projects and demonstrations, while Capacity Building offers training programs and research initiatives. Business Partnerships are facilitated to encourage collaboration between Indian IT-ITeS companies and EU/EFTA tech firms. Additionally, NASSCOM's Thought Leadership involves organizing events to explore the latest smart city trends, contributing to dynamic collaboration and sustainable growth.
- ASSOCHAM has been proactive in addressing the growing concerns in the digital space. Recognizing the importance of secure financial transactions and operational infrastructure, ASSOCHAM has been advocating for robust cybersecurity measures, especially around digital payments. ASSOCHAM and Ernst & Young have collaborated on preparing a joint report on Digital Financial security that highlights the existing legislations in India, types of frauds, key challenges around fraud detection, enforcement, investigation, and risk management in the online payment industry. This initiative underscores ASSOCHAM's commitment to fostering a secure digital environment in India.

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- BIS (Bureau of Indian Standards) plays a crucial role in promoting standardized digital connectivity for seamless cross-border smart cities. The organization is actively involved in Guideline Development, creating guidelines covering IoT, data privacy, cybersecurity, and communication protocols. Harmonizing Standards with EU/EFTA ensures streamlined technology interoperability. Collaborative Workshops and Research Initiatives are encouraged to address smart city standardization gaps through Project SESEI etc. The establishment of Joint Technical Committees is vital for collective standards development, and Certification Programs ensure quality infrastructure with compliance certification, including secure IoT devices.
- TTC (Trade and Technology Council) serves as a Collaboration Hub, providing a platform for Indian renewable energy companies to partner with EU/EFTA counterparts. Shared Goals identify mutual interests in sustainable urban development, focusing on projects like waste optimization with IoT and data analytics. Knowledge Exchange involves hosting webinars where Indian startups in energy-efficient construction share insights with European urban planners. TTC actively facilitates Partnership, fostering collaboration between Indian and EU/EFTA companies in electric vehicle infrastructure and expanding charging networks for EV adoption. Policy Alignment ensures harmonization of data privacy regulations for seamless cross-border data sharing in smart city projects.
- The Government of India through its Telecommunication Engineering Centre (TEC) has adopted TSDSI's transposed oneM2M and 3GPP standards as national standards for IoT/M2M technologies, marking significant milestones for standards-based solutions across various industries. TSDSI, India's Telecom SDO, organized a workshop addressing IoT/M2M use cases in Fintech and Smart Cities, recommending strategies for technology pilots and field trials. TSDSI's contribution to standardization in BIS ensures a unified, secure, and sustainable digital infrastructure in smart cities, aligning with the goal of driving digital communication standards for enhanced competitiveness in global ICT markets.
- The ISO/IEC 30145-3 standard, part of the Smart City ICT reference framework developed by ISO and IEC, establishes a layered ICT structure for streamlined smart city operations. Collaboratively, ISO, IEC, and ITU have formed a Smart Cities Task Force to address evolving standardization needs, ensuring global cities benefit from an interoperable framework. Another key contribution, ISO 37101, provides a comprehensive framework empowering cities to define "smart" objectives and strategies for sustainable development, guiding them in aligning goals with principles of sustainability.
- In India, CII has partnered with Tata Communications for the CII-Tata Communications Centre for Digital Transformation, which aims to drive the adoption of mobile, cloud, IoT, and cybersecurity. Additionally, CII, along with Deloitte Touche Tohmatsu India LLP, launched a comprehensive report highlighting 5G technology as a key enabler for the success of enterprise business.
- FICCI provides a platform for networking and consensus building within and across sectors and is the first port of call for Indian industry, policy makers and the international business community. FICCI, being the voice of India's business and industry, influences policy, encourages debate, and engages with policy makers and civil society to articulate the views and concerns of the industry, thereby playing a significant role in shaping these economic ties. The Urban Infrastructure & Smart Cities Committee has been set up by merging the FICCI Urban Infrastructure Committee and FICCI Task Force on Smart Cities. The committee comprises industry members from different areas such as urban infrastructure, information & communication technology, geospatial technologies, energy, homeland security, housing, manufacturing, infrastructure and academia.
- The Joint Technical Committee 1 (JTC1) is a joint technical committee of the International Organization for Standardization (ISO) and the International Electrotechnical Commission (IEC) that is responsible for developing and maintaining international standards for information technology (IT). JTC1 plays a vital role in cybersecurity standardization in India by developing and promoting international standards, contributing to national standards development, providing training and education, and participating in international initiatives. This work helps to protect India's critical infrastructure, businesses, and citizens from cyber threats.
- The National Quality Control Laboratory (NCL) plays a crucial role in India's cybersecurity landscape, actively contributing to the formulation of standards, conducting testing and evaluation, certifying products and services, promoting awareness, and contributing to research and development. NCL's efforts have significantly elevated cybersecurity practices in India, fostering digital resilience across sectors.
- CERT-IN (Computer Emergency Response Team - India) serves as a Cybersecurity Authority, mandated with obligations outlined in a 2022 directive. With a G-20 Focus during India's 2023 presidency, CERT-IN aims to enhance global digital cooperation. Collaboration with QUAD partners focuses on aligning privacy laws and data flow frameworks. Mutual Cybersecurity efforts between India and the EU/EFTA aim to share insights for stronger cybersecurity and data privacy. CERT-IN is actively involved in tracking Data Localization Progress and conducting Data Transfer Assessments, emphasizing a Data Privacy Emphasis in line with evolving global standards.

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- CERT-EU is a key organization in shaping a cybersecurity landscape across the European Union (EU/EFTA) member states by developing standardized frameworks for risk assessment, incident response, and security controls. Its proactive approach contributes to establishing a global-standard cybersecurity environment, laying the foundation for robust collaboration between India and the EU/EFTA. India's potential accession to the Budapest Convention for Cybercrime offers a pathway to align its cybersecurity initiatives with global norms, fostering enhanced international collaboration in addressing cyber threats and cybercrime. This alignment not only bolsters India's cybersecurity preparedness but also elevates global standards and practices, promoting a more secure and interconnected digital landscape.
- India's Digital Personal Data Protection (DPDP) Act is a groundbreaking regulation overseeing digital personal data processing, introducing "Consent Managers" to streamline data management and promoting data portability and economic growth. The Act outlines exemptions, emphasizes government entities' roles, and proposes a robust encryption mandate for data security. It also emphasizes secure authentication and considers collaboration with the EU/EFTA on electronic-IDs. Harmonization with GDPR for cross-border data transfers highlights India's commitment to global data protection standards and aligns with the EU's focus on responsible data practices, including open science initiatives and data anonymization.

Few following are opportunities between EU/EFTA – INDIA to strengthen further around Standards, Policies and Research on the topic of priority and mutual interest:

Climate Partnership:

- *Clean Energy Commitment:* The EU/EFTA and India established a Clean Energy and Climate Partnership in 2016, focusing on renewable energy, energy efficiency, and smart grids. There are untapped opportunities for increased collaboration in Standards, Policy, research, technology transfer, and large-scale deployment of clean energy solutions.
- *Promoting Renewable Energy:* The partnership supports initiatives like India's off-shore wind plant and the Solar Parks Programme, highlighting untapped potential in fostering sustainable energy initiatives.
- *Green Investments:* The EU/EFTA promotes green investments and blending financing for sustainable urban housing and mobility, offering untapped opportunities for catalyzing green investments in urban development.

Renewable Energy Transition:

- *Transition to Renewable Energy:* Both India and the EU/EFTA have ambitious renewable energy goals. Sharing knowledge, technologies, and financing solutions can accelerate the transition to a low-carbon, sustainable energy future.

Smart Cities and Digital Connectivity:

- *Investment Opportunities:* India offers significant opportunities for technology-sharing and know-how exchange, with EU/EFTA companies excelling in sectors like infrastructure, transport, telecoms, and basic industry. Exploring these untapped opportunities can strengthen sustainable modernization.
- *EIB's Contribution:* The European Investment Bank (EIB) is investing €2.5 billion in infrastructure, renewable energy, and climate projects in India. There are untapped areas where this investment can further drive sustainability and innovation.

Data Privacy and Innovation:

- *Commitment to Innovation:* Both India and the EU/EFTA share a commitment to the role of innovation in economic development and job creation. Exploring untapped opportunities for collaborative research and innovation projects can address global challenges.
- *Data Protection Reforms:* India's robust start-up ecosystem aligns with the EU's promotion of networking between innovators, start-ups, and incubators, presenting untapped potential for cross-border innovation and entrepreneurship.
- *Data Protection Cooperation:* Convergence in data protection systems could ease data flows between the EU/EFTA and India, promoting an adequacy dialogue on data protection standards, unlocking untapped opportunities for seamless data exchange.

Multilateral Cooperation:

- *Rules-Based Global Order:* EU/EFTA and India share a commitment to a rules-based global order, collaborating at international forums like the UN, G20, and WTO. Leveraging this commitment, there are untapped opportunities for jointly developing effective multilateral solutions to global challenges, fostering international security and economic stability.

Infrastructure Development:

- *Smart Infrastructure Initiatives:* Collaborating on smart infrastructure projects in transportation, energy, and healthcare can unlock untapped opportunities for modernization and improved urban living.



CIRCULAR ECONOMY



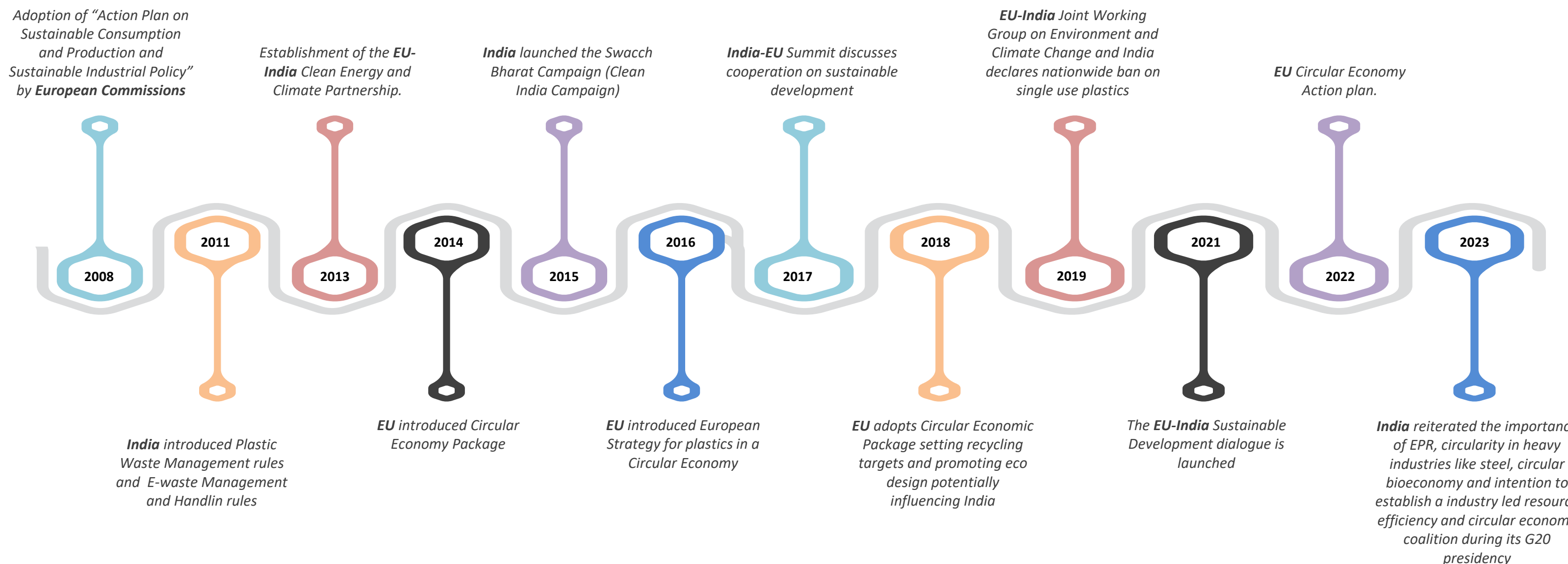
INTRODUCTION & TIMELINES

The Circular Economy (CE) is an intentional and regenerative industrial system, contrasting with the linear economy's extractive nature. It seeks to maximize resource, product, and material value and lifespan. The plastic and e-waste sectors are critical in this framework, requiring immediate attention due to their environmental impacts.

Plastic, a major focus of circular principles, poses environmental challenges. The rise of e-waste, a consequence of the digital age, adds to the problem. E-waste refers to discarded electronic products, significantly impacting the environment globally.

This chapter explores CE principles applied to plastic and e-waste in India and the EU/EFTA, examining market dynamics, policies, standardizations, and challenges. It dissects sector profiles, highlighting resource management complexities and sustainable practices in both regions.

In India, digitalization and economic growth drive Electronic and Electrical Equipment (EEE) usage, alongside struggles with plastic waste. In the EU/EFTA, a developed region with a robust circular economy, the chapter delves into advanced waste management, addressing challenges in e-waste and plastic waste.



MARKET DYNAMICS



E-waste

Plastic-waste

INDIA MARKET

Gold from e-waste worth € 640-910 billion

INDIA MARKET

Out of € 125 bn of plastic material that India loses every year, 75% if recoverable

EU/EFTA MARKET

CAGR of 16.6% with industry growth of € 201 bn (FY19) to € 507 bn (FY25)

EU/EFTA MARKET

Current plastic recycling rate of 23% with increasing demand for recycled and reinforced plastic growing at CAGR of 4%

KEY GROWTH DRIVERS

Demand for recycled and reinforced products

Slow down the material loop particularly

Generation of skilled manpower and technology

Formalization of recycling industry (in India)

POLICY INITIATIVES AND STANDARDS (E-WASTE)



INDIA POLICIES

E-waste rules 2011

The E-Waste (Management and Handling) Rules, 2011 in India establish guidelines for the proper management, handling, and disposal of electronic waste to minimize its environmental impact

Extended Producer Responsibility

Extended producer's responsibility (EPR) is the main feature of major waste management laws in India wherein the producer of electrical and electronic equipment has the responsibility of managing such equipment after its 'end of life'

Battery Waste management and handling rules 2022

For environmental sound management of batteries. The rules cover all types of batteries, including Electric Vehicle batteries, portable batteries, automotive batteries, and industrial batteries

BIS Standards

CHD 33 (terminology, methods of sampling and characterization, codes of practices on reduction, recycling, reuse and treatment of solid wastes)
ETD 43 (Standardization of Environmental Aspects for Electrical and Electronic Products)

EU/EFTA POLICIES

Waste from Electrical & Electronics Equipment (WEEE) regulations

Aims to promote sustainability in electronics by reducing environmental and health risks from improper e-waste disposal, conserving resources, and encouraging sustainable practices.

EU's Restriction of Hazardous Substances (RoHS) Directive

The directive limits hazardous substances in electronic equipment to minimize environmental and health risks.

Circular Economy Action Plan

The EU's Circular Economy Action Plan emphasizes the need to transition towards a circular economy, promoting sustainable consumption and production patterns.

CENELEC Standards

EN 50625: Collection, logistics & treatment
EN 50614: Methodology for the Assessment of Environmental Performance of Energy-Related Products
EN 50574: Marking of electrical and electronic equipment in accordance with Article 11(2) of Directive 2012/19/EU (WEEE)
EN 50419: Technical documentation

POLICY INITIATIVES AND STANDARDS (PLASTIC WASTE)



INDIA POLICIES

Plastic waste management rules 2011

The Plastic Waste Management Rules 2011 in India provide guidelines for the proper handling, collection, segregation, and disposal of plastic waste to minimize environmental impact and promote recycling.

Extended Producer Responsibility

Extended producer's responsibility (EPR) is the main feature of major waste management laws in India wherein the producer of electrical and electronic equipment has the responsibility of managing such equipment after its 'end of life'

Single Use Plastic (SUP) Waste Management

Rules were introduced to tackle single-use plastic challenges by promoting eco-friendly alternatives and reducing their use.

BIS and Indian standards

PVC pipes (**IS 4985**), polyethylene for food packaging (**IS 10146**), HDPE pipes for drinking water (**IS 10910**), polypropylene (**IS 14531**), unplasticized PVC (**IS 10141**), biodegradables (**IS 15801 and IS 16647**).
IS 14534: 2023: Plastics guidelines for the recovery and recycling of plastics waste.
IS 14535: 1998: Recycled plastics for the manufacturing of products – Designation

EU/EFTA POLICIES

EU Plastics Strategy of 2018

It the groundwork for a more circular and resource-efficient plastic economy. It highlighted the importance of reducing plastic waste and promoting recycling and reuse.

EU's Single-Use Plastics Directive

Targetted the 10 most common single-use plastic products found on European beaches, including fishing gear.

EU's Circular Economy Package

Package introduced higher plastic recycling targets: 55% by 2030 and 65% by 2035. It also promotes eco-design and the use of recycled plastics in new products.

EU's CENELEC's (CEN/TC 2)

Standardization of terminology, test methods, classifications and designation systems, environmental aspects, joining systems and techniques of plastics, plastic-based materials, semi-finished products and products (thermoplastics, thermosets, degradable plastics, bio-based polymers, thermoplastic elastomers, composites, reinforcement products for plastics, recyclates).

FUTURE POTENTIAL & RECOMMENDATIONS (E-WASTE)






		FUTURE POTENTIAL	RECOMMENDATIONS
RAW MATERIAL ACQUISITION	INDIA	<ul style="list-style-type: none"> No major mineral discovery in India for 40 years. Lack of exploration, especially in technology metals. Crucial for manufacturing modern devices and energy efficiency 	<ul style="list-style-type: none"> Promoting SRM adoption, incentivizing reduced mining dependence. Creating national material sampling labs. Mandating source disclosure and SRM usage targets for manufacturers. Boosting R&D and SRM extraction infrastructure. Focusing on CRM content, waste management, stock quantification, and quality alignment.
	EU/EFTA	<ul style="list-style-type: none"> EU/EFTA's ProSUM project: 1st urban mine knowledge database for e-waste. Aims to improve EU's raw material supply position. After 3 years, project offers recommendations for raw material acquisition in Europe. 	
PRODUCT DESIGN	INDIA	<ul style="list-style-type: none"> Rapid tech advancement in technology 	<ul style="list-style-type: none"> Circular Industry Guidelines Inspired by EU/EFTA Eco-Design Principles: Enforce eco-design principles for industry circularity. Implement compliance incentives and penalties. Set standards to prevent planned obsolescence. Build a skilled workforce through capacity development. Extend product lifespan, streamline remanufacturing and recycling, and reduce material use for resource sustainability.
	EU/EFTA	<ul style="list-style-type: none"> Advancements in recycling tech, but still behind E-waste complexity grows Recycling new products with existing recycling technology Design often neglects EOL Developed countries influence design 	
CONSUMPTION	INDIA	<ul style="list-style-type: none"> 74% in 2020 Global Scan Survey aim to reduce environmental footprint. Gap between aspiration and actual behavior. Difficulty making sustainable choices in an unsupportive system. Accessibility and affordability of eco-friendly products crucial for change. 	<ul style="list-style-type: none"> Implement CE labeling for consumer information; Promote circular consumption awareness programs. Set refurbishment, reparability, and spare parts guidelines; Encourage consumer-driven manufacturing and design. Provide product lease and rental options. Adopt green public procurement practices. Establish e-waste Deposit-Return Systems (DRSs). Expand the packaging Deposit-Return System to cover e-waste. Create a secondary electronic products market with buy-back schemes and clear guidelines.
	EU/EFTA	<ul style="list-style-type: none"> EU/EFTA consumption: savings-based economy. Higher per capita electronics consumption. EU/EFTA e-products have 2.3 years shorter lifespan than intended. Driven by rapid tech advances and factors like quality deterioration and market pressures. 	

		FUTURE POTENTIAL	RECOMMENDATIONS
COLLECTION/ DISMANTLING/ RECYCLING	INDIA	<ul style="list-style-type: none"> India's e-waste issue worsened by illegal recycling by kabadiwalas and raddiwalas.(informal waste pickers) These informal workers operate independently, evading regulation. Recyclers often use harmful methods, releasing toxic pollutants. 	<ul style="list-style-type: none"> Promoting SRM adoption, incentivizing reduced mining dependence. Creating national material sampling labs. Mandating source disclosure and SRM usage targets for manufacturers. Boosting R&D and SRM extraction infrastructure. Focusing on CRM content, waste management, stock quantification, and quality alignment.
	EU/EFTA	<ul style="list-style-type: none"> EU/EFTA WEEE Directive: Ensures safe electronic waste handling. Manufacturers and distributors are responsible for disposal. Consumers can return equipment for free. Producers must collect specific e-waste categories. 	
POST EOL/SECONDARY USE OF MATERIALS	INDIA	<ul style="list-style-type: none"> Rapid tech advancement in technology 	<ul style="list-style-type: none"> Circular Industry Guidelines Inspired by EU/EFTA Eco-Design Principles: Enforce eco-design principles for industry circularity. Implement compliance incentives and penalties. Set standards to prevent planned obsolescence. Build a skilled workforce through capacity development. Extend product lifespan, streamline remanufacturing and recycling, and reduce material use for resource sustainability.
	EU/EFTA	<ul style="list-style-type: none"> Advancements in recycling tech, but still behind E-waste complexity grows Recycling new products with existing recycling technology Design often neglects EOL Developed countries influence design 	



GAPS-CHALLENGES & RECOMMENDATIONS (E-WASTE)

	GAPS & CHALLENGES	INDIA- EU/EFTA RECOMMENDATIONS
INDIA	<p>Almost 1.5 lakh tons of e-waste generated finds its way into the informal sector.</p> <p>Leakages after waste collection towards informal recycling Auction of e-waste by the bulk consumers reduces collection efficiency.</p> <p>Informal recycling is done without proper safety equipment and training which exposes workers to hazardous materials such as lead, mercury, and cadmium.</p> <p>Creation of an effective auditable database of materials collected through this process and forming geographical clusters for device disassembly is required.</p> <p>Develop standards across the e-waste value chain using agencies like BEE, BIS, CPCB, and MoEFCC. Learn through collaborations from initiates from other parts of the world examples like WEEE Labex, CENELEC, E-stewards, R2 standards.</p>	<p>INFORMATION BASED</p> <ul style="list-style-type: none"> • Voluntary Environmental Agreements with industries • Information flow across value chain stages • Raising awareness and providing product environmental information <p>MARKET BASED</p> <ul style="list-style-type: none"> • Recognition and benchmarking • Mandate manufacturers to promote circular economy in advertising. • Green product procurement: Incentivization: Offer rebates and tax reductions. • Inclusion in Green Credits. <p>REGULATORY</p> <ul style="list-style-type: none"> • Categorization of e-waste based on toxicity. • EPR targets based on product weight: Implement digital system for EPR monitoring and information sharing. • Establish a dedicated EPR budget and enforcement fund. • Graded penalties
EU/EFTA	<p>The EU's significant reliance on imports exposes a vulnerability, necessitating a transition towards a circular economy to mitigate dependence and alleviate environmental pressures.</p> <p>Recycling of lithium-ion batteries (LIBs), a remains a challenging and evolving domain, presenting a notable impediment to achieving circularity.</p> <p>There is disparity in eco-investment benefits across EU member states.</p> <p>Remove constrains of costs and the fragmentation of EU's e-waste management market with digital solution uptake by waste operators and producer responsibility organizations (PROs).</p> <p>Collaborative efforts between EU and other nations through shared platform to share best practices and learn from each other</p>	<p></p> <p></p> <p></p>

GAPS-CHALLENGES, FUTURE POTENTIAL & RECOMMENDATIONS (PLASTIC)



		FUTURE POTENTIAL	RECOMMENDATIONS			FUTURE POTENTIAL	RECOMMENDATIONS		
RAW MATERIAL ACQUISITION	INDIA	<ul style="list-style-type: none"> India relies on virgin plastic production to meet demand. High plastic recycling rate in India, but EOL polymers often downcycled instead of forming a closed loop 	<ul style="list-style-type: none"> Invest in recycling infrastructure and polymer-specific R&D. Introduce tax incentives favoring recycled plastic products. Establish quality standards for recycled plastic. Promote a shift in manufacturer mindset towards recycled plastic use.. 	COLLECTION/ DISMANTLING/ RECYCLING	INDIA	<ul style="list-style-type: none"> India's informal sector vital for waste collection, handling most plastic but lacking tech for quality 	<ul style="list-style-type: none"> Sort at source for better municipal recycling. DRS cuts plastic waste and enhances collection. Fast-track R&D for polymer-specific tech. Further TRANSFORM-CE project of EU/EFTA for innovative plastic recycling. 		
	EU/EFTA	<ul style="list-style-type: none"> EU/EFTA excels in plastic recycling tech. Lower plastic management volume. Growing use of secondary plastic in manufacturing. Recycled plastic market penetration still low. 			EU/EFTA	<ul style="list-style-type: none"> EU/EFTA's reduced plastic waste exports Exporting waste reduces availability of secondary raw materials Rising demand exacerbates the problem 			
PRODUCT DESIGN	INDIA	<ul style="list-style-type: none"> India embracing circular plastic design but faces awareness and infrastructure challenges. Ban on SUPs lacks strong implementation. 	<ul style="list-style-type: none"> Standardize SUP definitions, ban low-end street vendors. Track suppliers, inspect, penalize rule-breakers. Promote reusable and plastic-free options. Enforce plastic reduction laws. Opt for recyclable mono-layer packaging. Focus on recyclable plastic packaging. 		POST EOL/SECONDARY USE OF MATERIALS	INDIA		<ul style="list-style-type: none"> Custom of hands down in Indian consumer culture Indian households use single-use plastic products like PET bottles and carry bags repeatedly, affecting the resource loop Circular economy (CE) requires more than secondary usage for plastic products 	<ul style="list-style-type: none"> Low-value end-of-life (EOL) plastic products in need of substitution and reduced production. In EU/EFTA the focus should be on increasing the product lifetime and recycling plastic waste rather than only on disposal, incineration, and exporting.
	EU/EFTA	<ul style="list-style-type: none"> Plastics use various polymers and customized additives. Customization complicates recycling and raises costs. Quality and value of recycled plastic affect product design 				EU/EFTA		<ul style="list-style-type: none"> High per capita plastic consumption in EU/EFTA. Urgent need to reduce plastic production and introduce competitive alternatives. 	
CONSUMPTION	INDIA	<ul style="list-style-type: none"> Plastic suits India's price-sensitive market. An affordable alternative is needed to reduce low-grade plastic use in India. 	<ul style="list-style-type: none"> Promote usage of traditional Indian materials like husk, paper, leaves etc. to replace plastic Prioritize bio-based alternatives. Disclose plastic usage in institutions. Regular audits and voluntary reduction of usage Encourage aluminum packaging. Set individual consumption goals. Introduce plastic credits. 						
	EU/EFTA	<ul style="list-style-type: none"> EU/EFTA consumption is more extravagant than India High per capita plastic consumption in EU/EFTA 							



GAPS-CHALLENGES & RECOMMENDATIONS (PLASTIC)

	GAPS & CHALLENGES	INDIA- EU/EFTA RECOMMENDATIONS
INDIA	<p>India is a price sensitive market and preference is towards availability of low-cost goods in the market rather than high quality expensive products. This demand feeds well into the current practice of informal downcycling of collected products into low quality daily items. Formal recycled lose out on significant raw materials in the process.</p> <p>The transition towards a circular plastics economy necessitates significant investments in infrastructure and technology, along with robust policy frameworks that incentivize sustainability.</p> <p>Collaboration between public and private sectors, as well as the integration of informal waste sectors, remains difficult but is vital in achieving meaningful progress towards a circular economy.</p>	<p>INFORMATION BASED</p> <ul style="list-style-type: none"> Public awareness to promote more and more waste segregation. Environmental messaging: GoI's Ecomark scheme. Start young: Teach kids 4Rs under UNESCO's program. <p>MARKET BASED</p> <ul style="list-style-type: none"> Learn and adopt best practices from others: Higher taxation to discourage SUP and multilayer plastic use. Plastic EOL management in Green Credits program. <p>REGULATORY</p> <ul style="list-style-type: none"> Mandate recycled plastics in non-food sectors Regulate plastic content, promote mono polymers, packaging substitutes Address plastic degradation with virgin plastic additives. Ban Single Use plastics and multi-layer polymers.
EU/EFTA	<p>High consumer culture and penchant for high quality products among European consumers creates mental block against secondary plastic products. Additionally, low prices of virgin plastics make them economically more attractive for manufacturers, discouraging the use of recycled plastics.</p> <p>Need is for consumer awareness and a shift in behaviour change.</p> <p>Volatility in Recycling Markets: Fluctuations in oil prices and global demand affect the prices of recycled plastics, creating uncertainty for recycling businesses.</p>	<p>REGULATORY</p> <ul style="list-style-type: none"> Mandate recycled plastics in non-food sectors Regulate plastic content, promote mono polymers, packaging substitutes Address plastic degradation with virgin plastic additives. Ban Single Use plastics and multi-layer polymers.





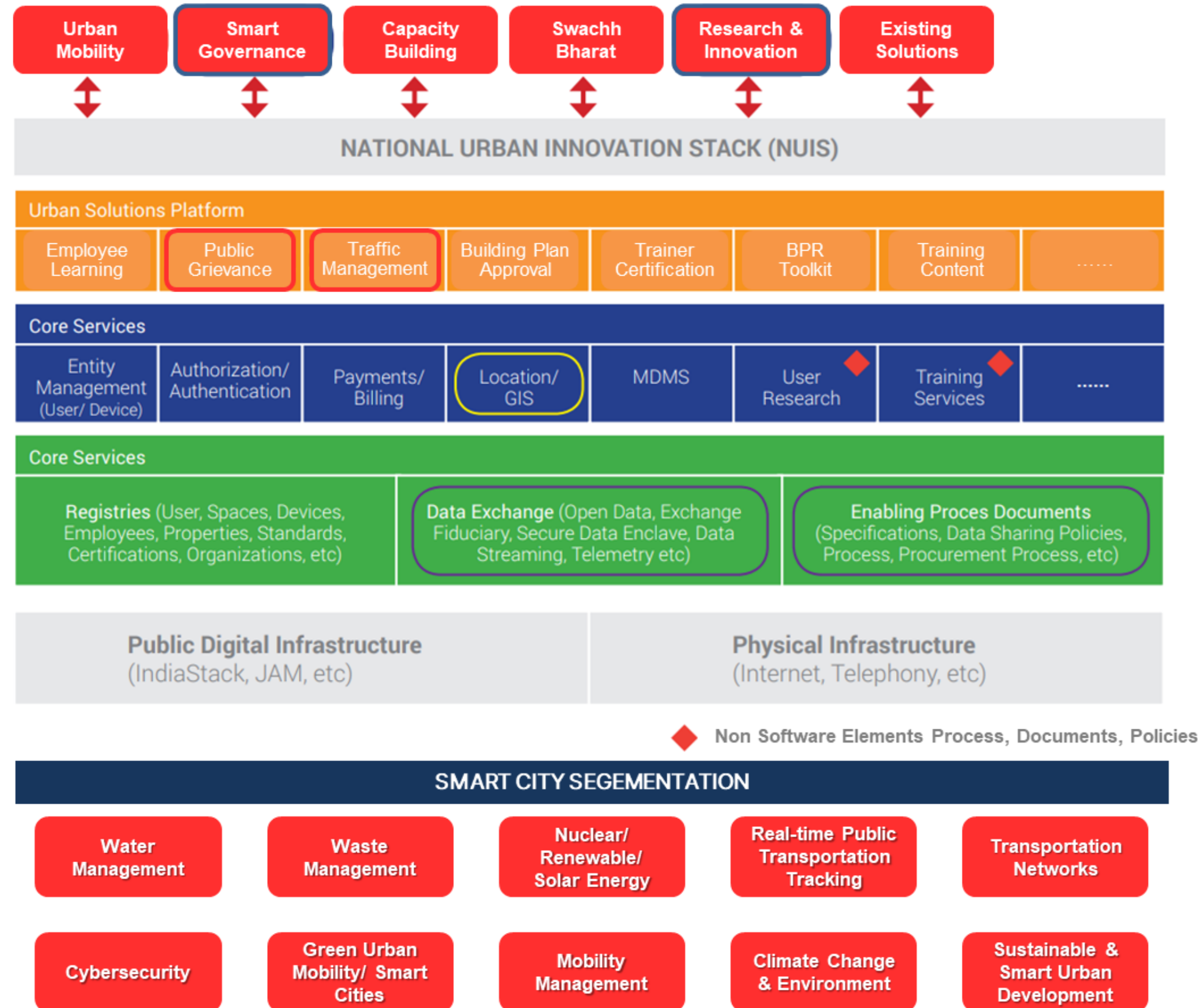
CONNECTIVITY IN SMART CITIES

(DIGITAL | ENERGY | TRANSPORT)



INTRODUCTION & TIMELINES

Source: DataSmart_Cities



The Smart Cities Mission, in partnership with the Ministry of Housing and Urban Affairs (MoHUA) and the National Institute of Urban Affairs (NIUA), has jointly introduced a strategy document outlining the National Urban Innovation Stack (NUIS). This slide serves as the foundational blueprint for the entire concept, which plays a crucial role in establishing a sturdy framework for the DataSmart platform, marking the principles of digital technology, potential sourcing model, and publishing model for city data. Additionally, it outlines the importance of the SmartData Platform and its specific position within the broader ecosystem

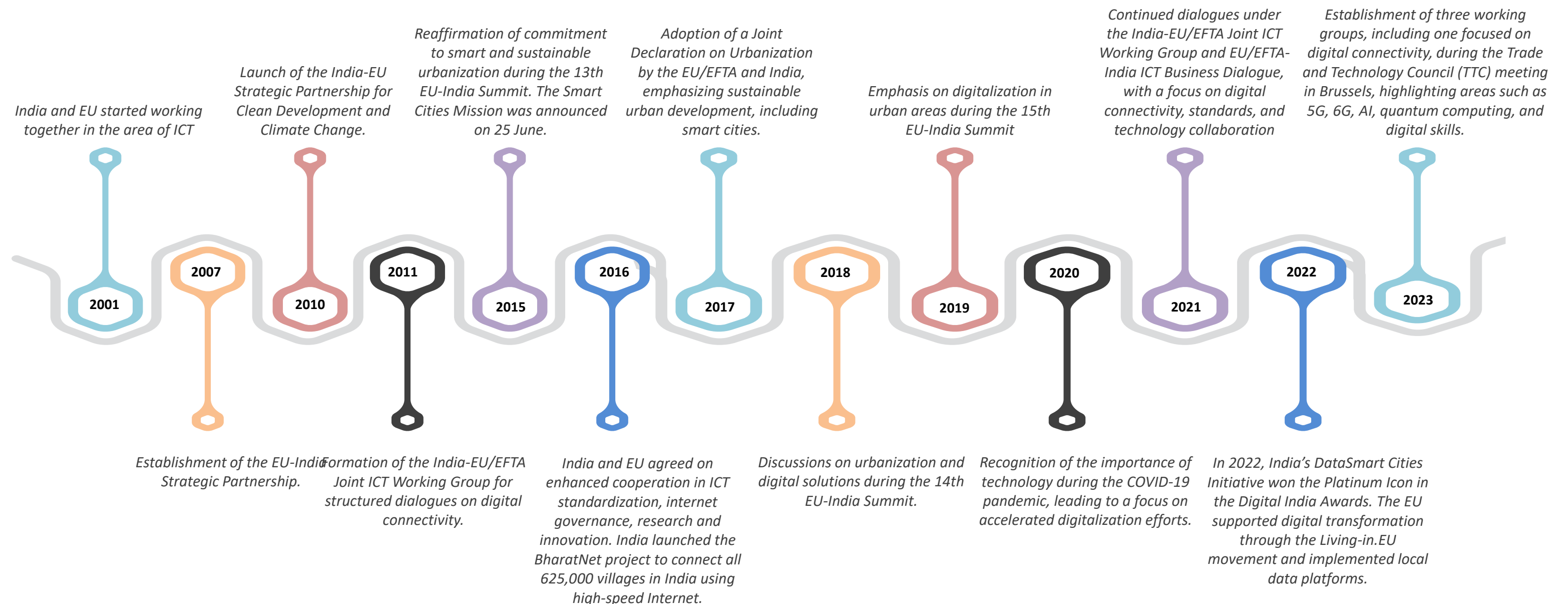
The digital aspect connects all the macro and micro level segmentation, incl. Energy, Transport, Healthcare, Education, Water Management, Waste management, Public Safety, Urban planning amongst others. This paper highlights these parameters thereby underlining that the digital aspects / data platforms hold paramount significance within this entire concept.



INTRODUCTION & TIMELINES

A smart city is a technologically modern urban area that uses different types of electronic methods and sensors to collect specific data. Information gained from that data is used to manage assets, resources and services efficiently; in return, that data is used to improve operations across the city.

In the era of rapid urbanization, this concept of Smart Cities has emerged as a transformative force, reshaping the urban landscape through innovative technologies and digital integration. The chapter delves into the dynamic realm of Smart Cities, encapsulating the profound influence of the digital revolution on urban development. As the digital revolution unfolds, it catalyzes unprecedented advancements in the energy, transportation, and overall infrastructure sectors. Exploring the sector profiles of Smart Cities in both India and the European Union (EU), this chapter navigates through the intricate market dynamics of these sub-sectors. It scrutinizes the policies and standards governing Smart Cities, elucidating the distinctive approaches embraced by India and the EU in fostering urban intelligence. Amidst the progress, the narrative does not shy away from unraveling the gaps and challenges that underscore the journey toward smart urbanization. This comprehensive exploration seeks to provide a holistic understanding of the intricate tapestry of Smart Cities, bridging the technological advancements with the socio-economic and policy landscapes of India and the EU.

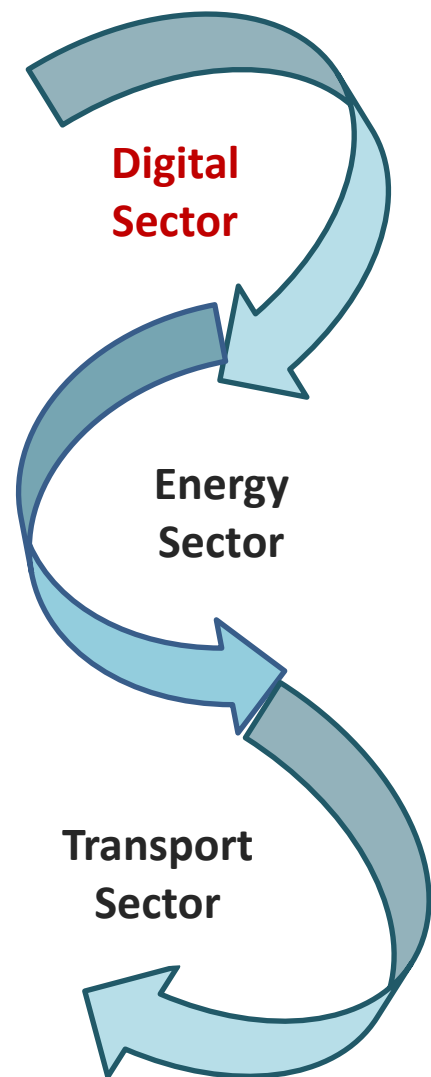




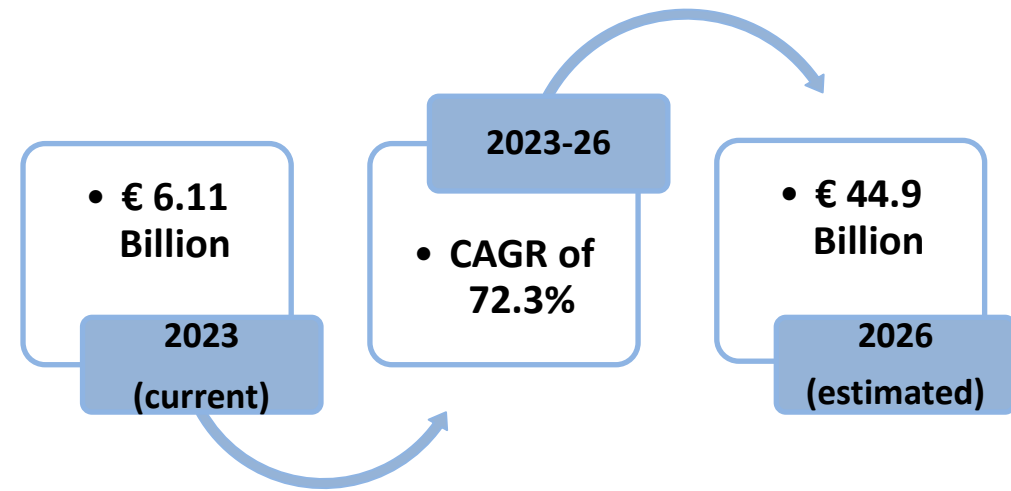
4.2 MARKET DYNAMICS (DIGITAL SECTOR)

The central idea driving the digital transformation of both the EU/EFTA and India is a focus on "human-centric digitalization for fostering inclusive economies and societies." In their July 2020 summit, these two entities concurred on advancing worldwide digitization standards that prioritize secure and ethical implementation.

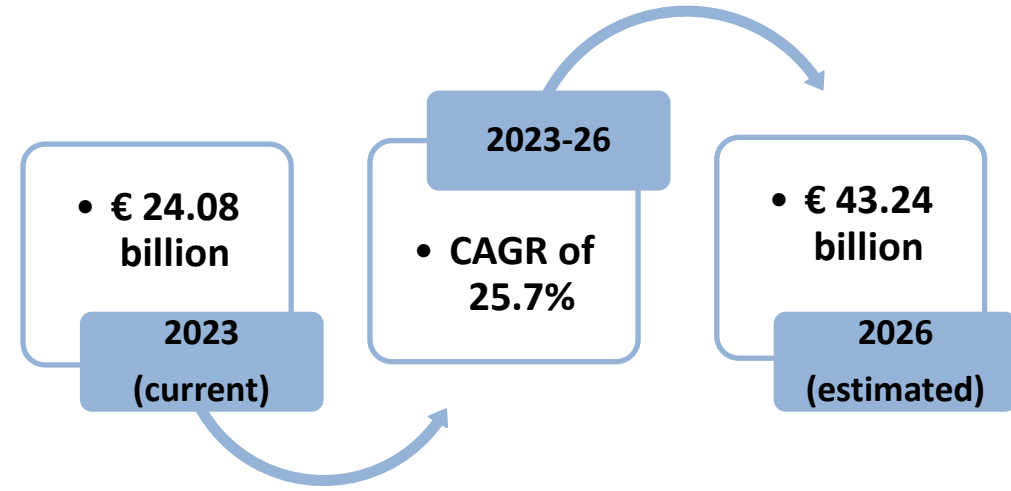
MAJOR DIVISIONS OF CONNECTIVITY



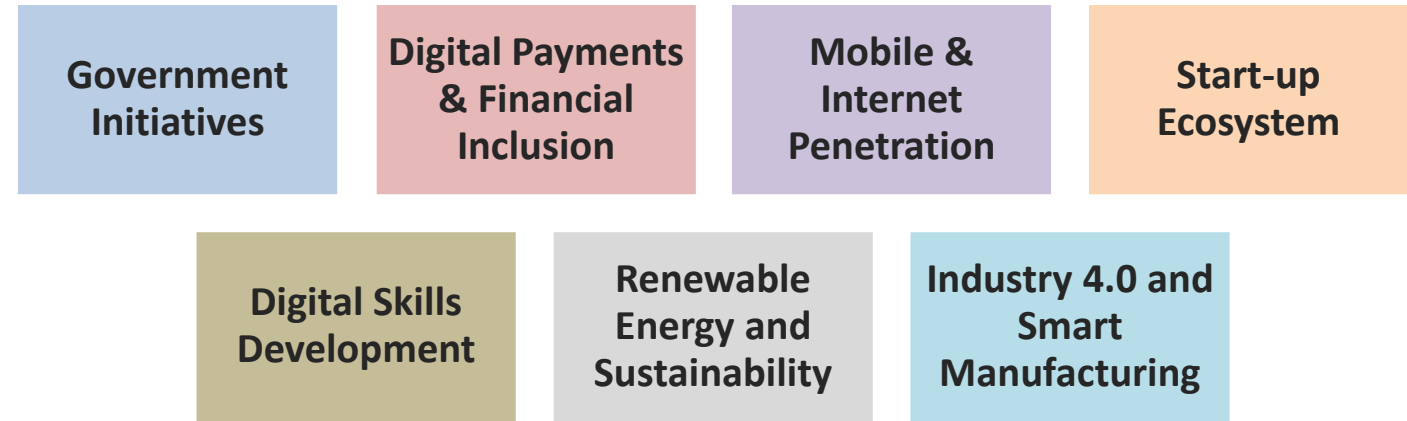
INDIA STATISTICS



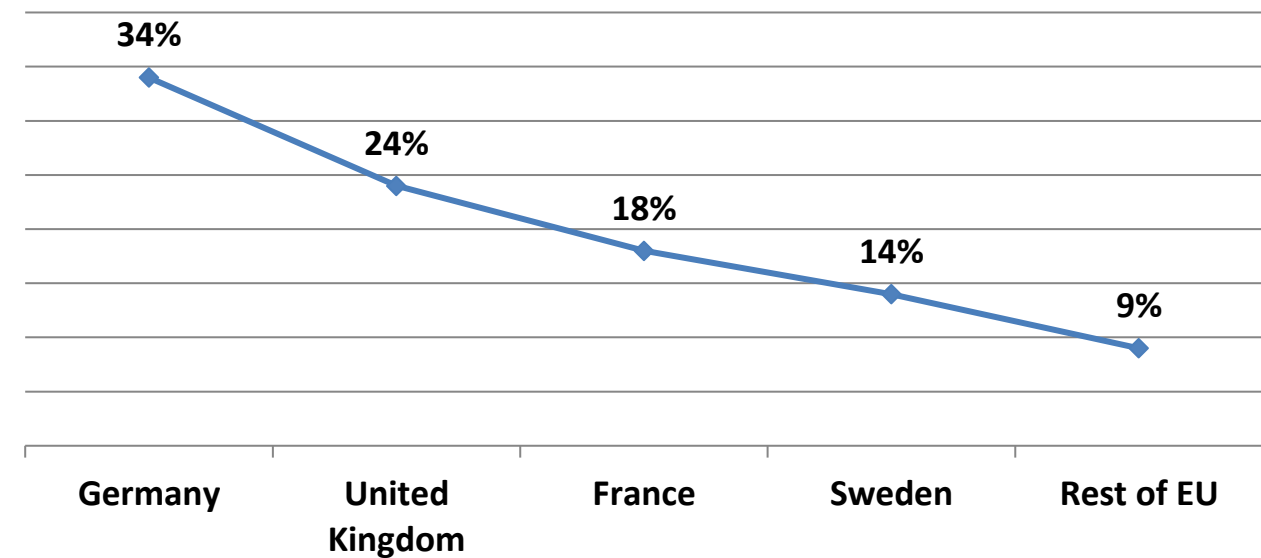
EU/EFTA STATISTICS



KEY GROWTH DRIVERS



EUROPE DIGITAL TRANSFORMATION MARKET SHARE(%), BY COUNTRIES



POLICY INITIATIVES (DIGITAL SECTOR)

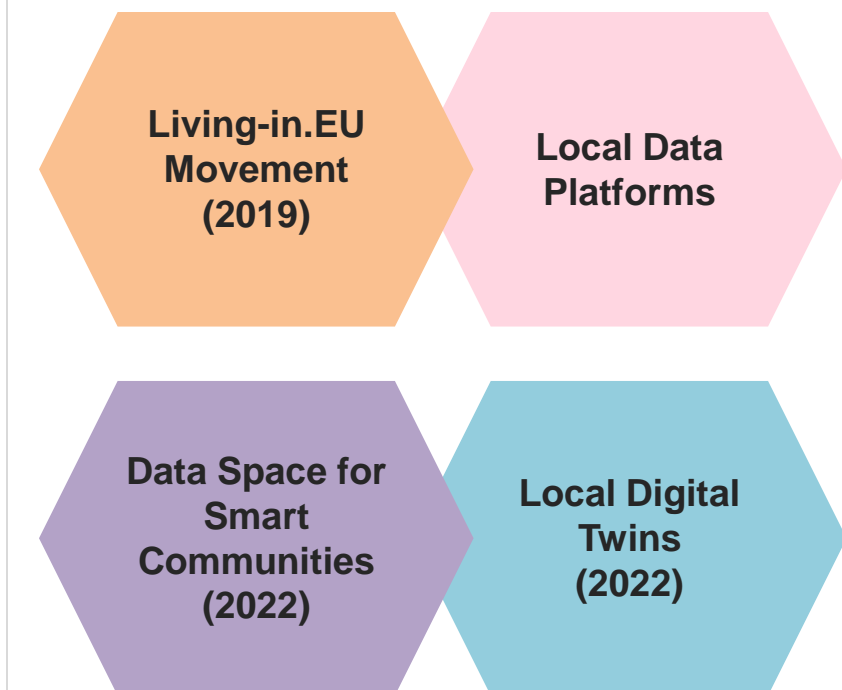


INDIA POLICIES



INDIA- EU/EFTA COMBINED POLICIES		
DIGITAL CONNECTIVITY IN SMART CITIES		
Geography	Policy Name	Policy Description
INDIA- EU/EFTA Policy Collaborations	City Investments to Innovate, Integrate and Sustain, CITIIS 1.0(2018)	A joint program of the Ministry of Housing and Urban Affairs, AFD, EU, and NIUA. The program had a total outlay of EUR 106 million. It aims to support competitively selected projects promoting circular economy with focus on integrated waste management at the city level, climate-oriented reform actions at the State level, and institutional strengthening and knowledge dissemination at the National level.
	CITIIS 2.0 (2023)	Approved in 2023 , with an investment of EUR 200 million by AFD and KfW, alongside a grant of EUR 12 million from the EU/EFTA. It aims to provide financial and technical support for up to 18 Smart Cities for projects promoting circular economy with focus on Integrated Waste Management, support to all States/Union Territories (UTs) for Climate action, and interventions at National level to support scale-up across all cities and towns.

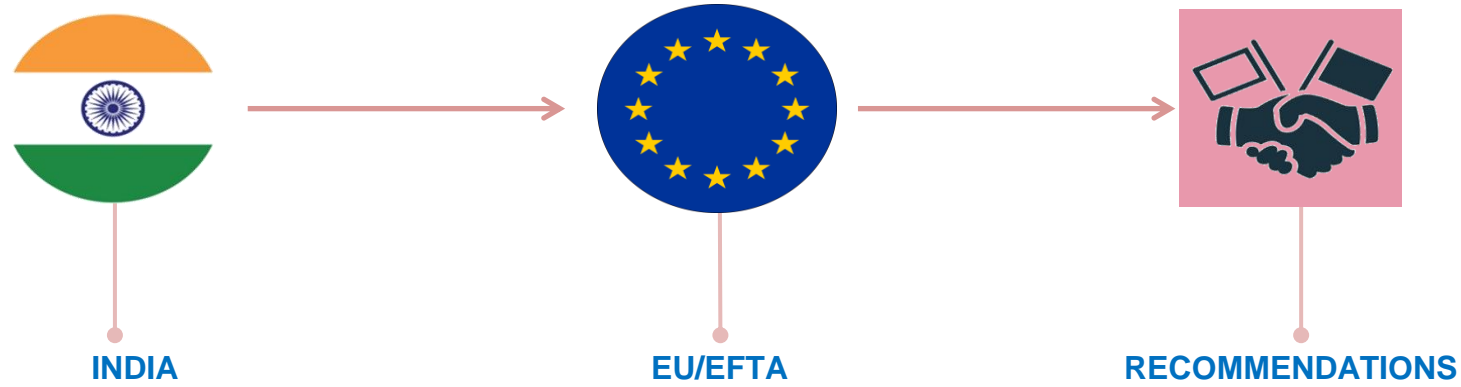
EU/EFTA POLICIES





STANDARDISATION

CENTRE OF EXCELLENCE (CoE)

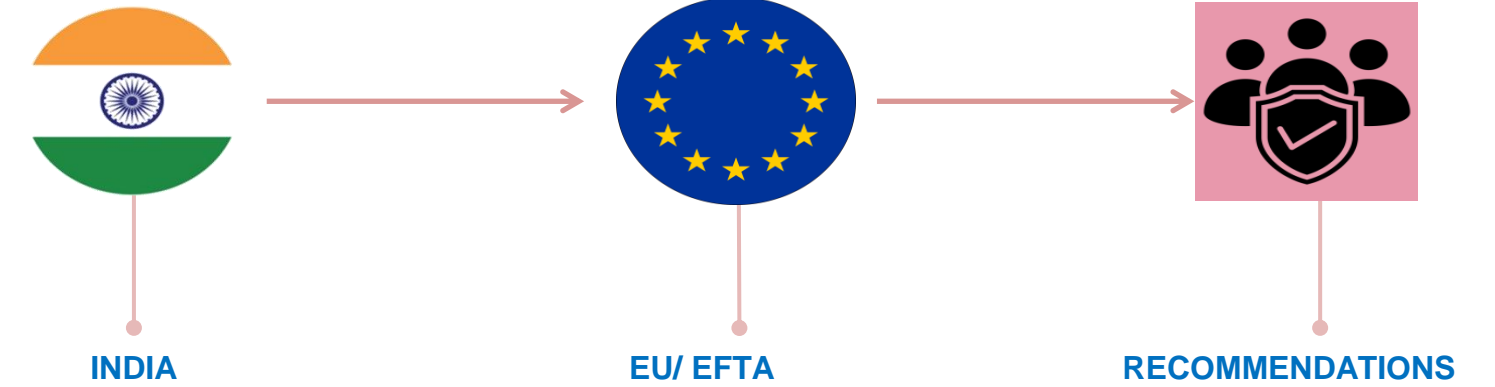


- NASSCOM's Centre of Excellence for IoT & AI in India's Smart Cities.
- Aligns digital connectivity standards in smart cities.
- Collaborates with MeitY for policy standardization.
- Supports Smart Cities Mission 2015 for economic growth and improved quality of life.
- Institutionalized Smart City Research Center at IIIT, Hyderabad.
- Collaborates with EBTC and Amsterdam Innovation Arena.

- European Innovation Partnership on Smart Cities and Communities (EIP SCC).
- Aligns digital connectivity standards across EU smart cities.
- Utilizes innovative technologies, funding, and partnerships.
- Has a Strategic Implementation Plan and six action clusters for specific development areas.
- Created reference architecture for an open urban platform, now a DIN standard.
- Provides a framework for interoperability aiding smart city development.
- Living-in.EU: City-led collaborative platform for digital transformation.
- Aims to scale solutions into real-life deployment in majority of EU/EFTA cities.

- NASSCOM & EIP SCC Collaboration
- Align smart city standards.
- Share best practices.
- Conduct joint research in IoT, 5G, Intelligent Transport Systems.
- Initiate projects to address challenges.
- Foster mutual learning through exchange programs.
- Ensure solution interoperability for digital transformation.

POLICY COLLABORATION

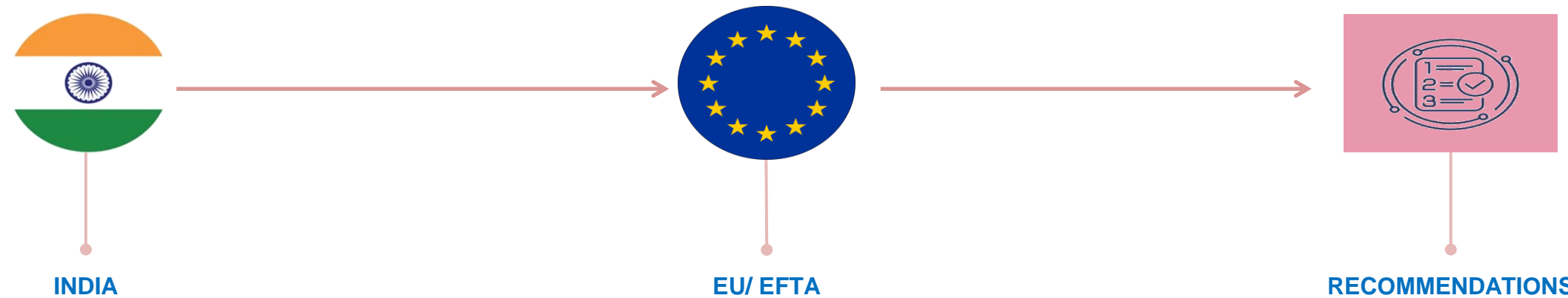


- Digital India Initiatives
- Develop policies and guidelines for interoperability of digital technologies.
- Promote global standards and address smart city-specific connectivity.
- Collaborate with government bodies, industry stakeholders, and technology providers.
- Build robust ICT infrastructure supporting smart city initiatives by considering privacy, cybersecurity, open data, and digital accessibility.
- Drive digital transformation of cities for smarter, more efficient functioning.

- European Commission's Collaboration with Smart Cities and communities to improve citizen services and achieve European Green Deal objectives.
- EIP SCC, a key initiative, brings together stakeholders in six action clusters.
- Initiates Smart Cities Lighthouse Projects.
- Positive results seen in smart grids, energy efficiency, and water sector digitization.
- Exploring common energy data exchange format under Smart Grids Task Force.
- Digital Single Market and Digital Europe Programme also under development.

- Advocating for Supportive Policies and Regulations
- Utilizing India's "Digital India" initiative.
- Aligning regulatory frameworks with EU/EFTA's "Digital Europe Programme."

PRIORITY AREAS



- Smart City Digital Connectivity
- Addresses data security, high-speed communication.
- Promotes efficient energy and intelligent infrastructure.

- India-EU/EFTA Trade and Technology Council (TTC) Overview
 - Established in 2022.
 - Focuses on AI, 5G/6G, computing technologies, cybersecurity, digital skills, clean energy, circular economy, waste management, and resilient value chains.
 - Ensures interoperability and security through collaboration.
 - Aligns Project SESEI priority topics for standardization.

- India-EU Collaboration:
 - TTC ensures interoperability and security.
 - Continued engagement through TTC and Project SESEI.
 - Focuses on R&D, Policy, Standardization.



STANDARDISATION

TRAFFIC MANAGEMENT SOLUTIONS



INDIA

- Smart Cities Traffic Management Solutions
- Implement adaptive traffic control systems.
- Utilize AI initiatives.
- Implement intelligent transport systems.
- Utilize IoT platforms.
- Leverage global standardization efforts.
- Improve traffic flow and road safety.



EU/EFTA

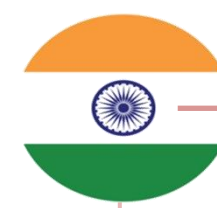
- EU/EFTA Smart City Traffic Solutions
- Standardized using digital connectivity, adaptive traffic control, AI, and IoT.
- EU's Smart City Standardization Initiative ensures interoperability.
- Living-in.EU movement advocates for responsible data usage and citizen co-creation.
- Aims to improve road safety, traffic flow, and transport sustainability.



RECOMMENDATIONS

- Smart City Traffic Management Strategies
- Adopt adaptive traffic control, AI, intelligent transport systems, IoT.
- Promote global standardization and robust digital infrastructure.
- Implement strategic traffic management plans and interoperability efforts.
- Encourage citizen-centric initiatives like Living-in.EU movement.
- Tailor strategies to individual city needs.

KNOWLEDGE EXCHANGE AND EXPERTISE SHARING



INDIA

- India's Smart Cities Mission: ICCCs and IUDX
- ICCCs integrate urban services using ICT.
- IUDX facilitates secure data exchange.
- Together standardize digital connectivity in smart cities.



EU/EFTA

- European Innovation Partnership on Smart Cities
- Aligns digital connectivity standards across EU smart cities.
- Leverages innovative technologies, funding, and partnerships.
- European Platform for Intelligent Cities aids in data exchange.



RECOMMENDATIONS

- A collaboration between these platforms could facilitate the exchange of best practices and innovative technologies.
- This partnership could align digital connectivity standards and enhance the efficiency of urban services.
- Such a collaboration could accelerate the digital transformation of cities in both regions, making them smarter and more efficient.

PRIORITY AREAS



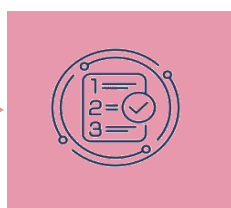
INDIA

- Indian Chambers of Commerce & Industry's Role in Smart Cities
- Influences policy through engagement with policy makers and civil society.
- Advocates for global standards for digital connectivity in smart cities.
- Fosters public-private partnerships and promotes technological innovation.
- Standardizes policies in digital connectivity in smart cities.



EU/EFTA

- Digital Europe and AIOTI: Trade Barrier Reduction and Privacy Concerns
- Digital Europe aims to remove trade barriers for European industry and consumers.
 - AIOTI involves connected devices exchanging data, including sensitive personal information, raising privacy concerns.



RECOMMENDATIONS

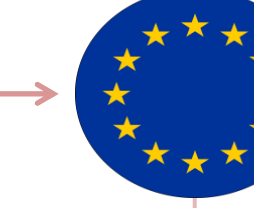
- EU-India Industry Associations' Role
- Advocating for policy reforms and public-private partnerships.
- Promoting technological innovation.
- Removing trade barriers.
- Producing high-quality products and services.
- Leading to efficient, accessible, sustainable smart cities.

SMART WASTE MANAGEMENT



INDIA

- "Waste Management in Indian Smart Cities: Bigbelly and E-Waste Rules"
- AWMINS introduces Bigbelly for smart waste collection.
- Smart bins improve garbage classification and collection.
- E-Waste Rules, 2022, digitize e-waste management for transparency.
- Large daily generation and environmental concerns pose challenges.



EU/EFTA

- EU/EFTA Waste Framework Directive establishes legal foundation for waste treatment and management.
- Emphasizes hierarchy of prevention, re-use, recycling, recovery, and disposal.
- Aligns with EU's comprehensive waste management approach, "Being Wise with Waste." Policies address waste management & circularity in various sectors.
- Aims for comparative analysis with municipal, industrial, and construction waste.



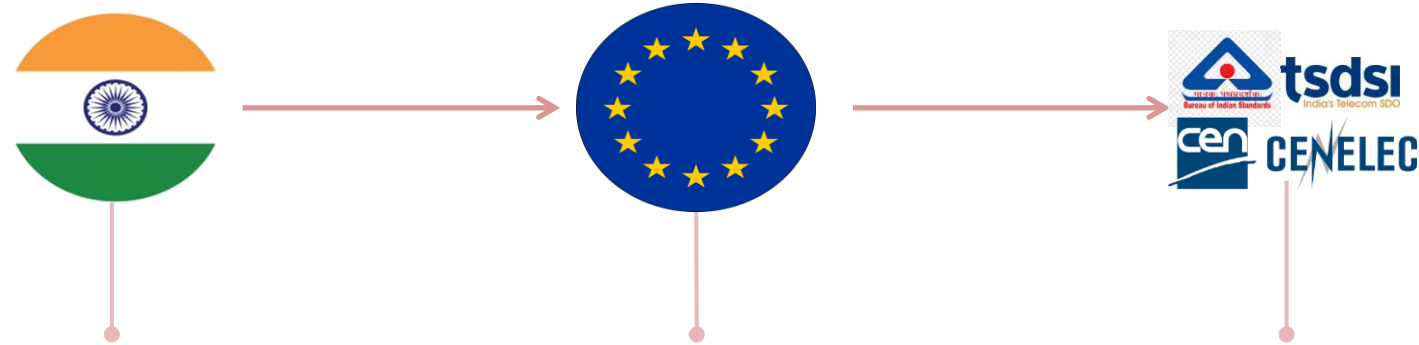
RECOMMENDATIONS

- Smart Waste Management Initiatives in India and EU/EFTA
- Strong smart waste management programs.
- India's smart bins and e-waste digitization complement EU's waste hierarchy and circularity policies.
- Collaborative efforts facilitate best practices exchange, technology sharing, and joint standards development.



STANDARDISATION

BIS-TSDSI-TEC & CEN-CENELEC-ETSI



INDIA

EU/EFTA

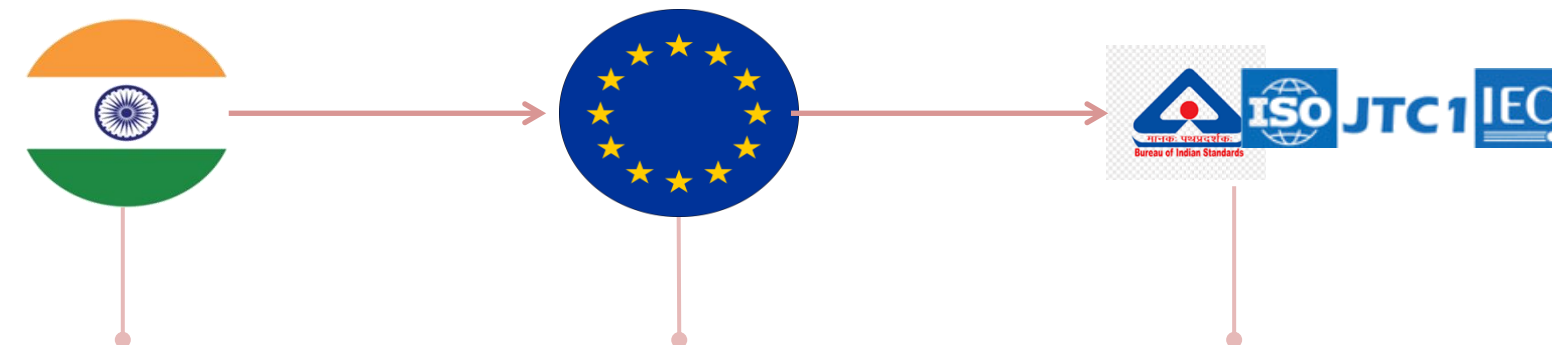
RECOMMENDATIONS

- BIS and TSDSI in India
 - BIS developed IS 18000 Unified Digital Infrastructure – ICT Reference Architecture as an international standard.
 - TSDSI develops standards for Telecom/ICT products and services in India.
 - Department of Telecommunications and Telecommunication Engineering Centre standardize digital connectivity policies.
 - TEC formulates standards for telecom and ICT sector used by TSP.

- CEN and CENELEC are working on reducing energy costs and deploying new technologies for energy transition.
- ETSI is establishing digital connectivity standards in EU/EFTA smart cities.
- ETSI is part of the International Working Group on IoT-Enabled Smart City Framework.
- ETSI ISG CIM group is developing NGSI-LD for information exchange.
- Cooperation's with standards bodies facilitate interoperability with IoT platforms, mobile apps, legacy databases, and linked open data systems.

- Indian-European Telecom/ICT Collaboration
- Development and alignment of standards for telecom/ICT products and services.
- Reflection of Indian requirements into International standards.
- Potential for efficient, accessible, sustainable smart cities.
- Standardization of digital connectivity policies and sector standards.

BIS & ISO/IEC/JTC1



INDIA

EU/EFTA

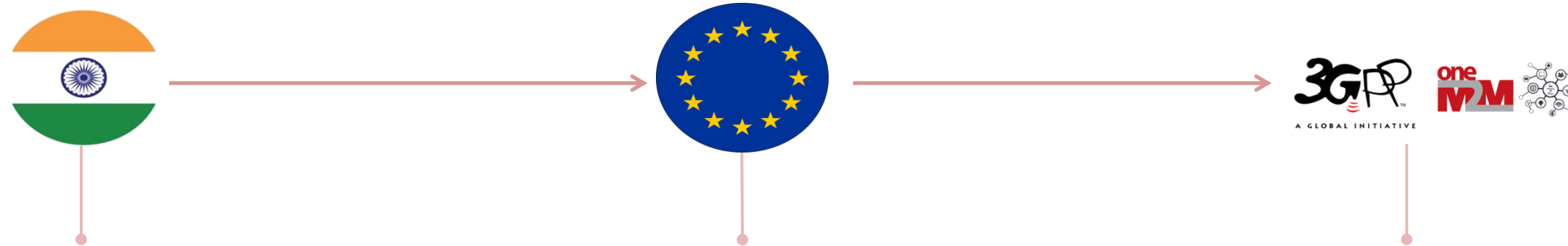
RECOMMENDATIONS

- "BIS and Smart Cities Mission in India"
- BIS and Smart Cities Mission collaborate on ICT standards.
- Standards developed by LITD 28 Smart Infrastructure sectional committee.
- Aim to create Unified Digital Infrastructure across Smart Cities.
- BIS participates in relevant TCs at ISO, IEC, JTC1.

- EU's ISO/IEC 30145-3 Standard for Smart Cities
- Provides comprehensive ICT framework for smart city operations.
- Part of European Commission's digital transformation efforts.
- JTC1, Smart Cities Working Group (WG11), developing standards for ICT use in smart cities.
- Developing Smart City Framework Standard (PAS 181) and Data Concept Model for Smart Cities (PAS 182).
- Working on IoT Architectural Framework (IEEE P2413).

- ICT Standards for Smart Cities in India and EU
- Adoption of ISO/IEC 30145-3 and ISO 37101 for standardized smart city connectivity.
- Leveraging JTC1's PAS 181 for successful smart city projects.
- Data Interoperability through PAS 182.
- Adoption of IEEE P2413 for effective IoT integration in smart cities.
- International Collaboration with ISO, IEC, and ITU for globally recognized smart city standards.

ITU 3GPP OneM2M



INDIA

EU/EFTA

RECOMMENDATIONS

- ITU-T Study Group 20 focuses on international standards for IoT and smart cities.
- 3GPP submits 5G technologies for global approval, crucial for smart city infrastructure.
- TEC leads India's work on the ITU 6G Framework, with contributions from industries, startups, academia, and R&D organizations.
- DoT is propelling 6G research and development in India, with a Technology Innovation Group set up.
- The TEC has adopted oneM2M specifications as a national standard, fostering collaboration among IoT developers. OneM2M implementations in India include Mobius, OASIS, CCSP, and Eclipse OM2M.

- EU's Smart Cities Standardization
- ITU and 3GPP are key in standardizing digital connectivity in EU's smart cities.
- ITU-T Study Group 20 develops international standards for IoT and smart cities.
- 3GPP leads 5G standards development for smart city infrastructure.
- EU Joint Task Force coordinates international standardization for smart cities.
- OneM2M is used as a holistic interoperability reference for smart cities.
- EU created the European Innovation Partnership on Smart Cities and Communities (EIP SCC).

- India-EU Collaboration for IoT, Smart Cities, and 5G
- Adoption of global standards via ITU and 3GPP platforms.
- Consideration of joining EU, ITU, and ISO Joint Task Force for standardization.
- Mutual exchange of smart city project best practices.
- Joint research to advance digital connectivity technologies.
- Strive for policy harmonization in smart cities for consistent regulations.
- Exchange of insights on implementing the oneM2M standard in smart city projects.
- Collaboration on refining the oneM2M standard for evolving smart city needs.
- IoT collaboration boost through adoption of oneM2M standard.
- Participation in the EU's EIP SCC for learning from smart city initiatives.

GAPS-CHALLENGES, FUTURE POTENTIAL & RECOMMENDATIONS



		FUTURE POTENTIAL	RECOMMENDATIONS	GAPS & CHALLENGES	RECOMMENDATIONS
Smart Waste Management	INDIA	<ul style="list-style-type: none"> •AWMINS: Smart bins for IoT garbage sorting. •Waste Segregation and Recycling: Policies for better waste segregation: awareness, incentives, enforcement. •Waste-to-Energy Projects: Expand waste-to-energy for urban waste and energy. •Smart City Consultants: Professionals are crucial in devising a waste management strategy for a smart city's development plan. •Earthzy: It is a Bengaluru-based company that develops innovative tech for efficient waste management, including their flagship product, RecycloBin, a smart waste compactor bin. 	<ul style="list-style-type: none"> • India and the EU/EFTA collaborate on smart waste management R&D. • India learns from EU's ENS, SMART WASTE, and Digital Technologies projects. • EU/EFTA could share knowledge from India's AWMINS and Earthzy Technology Solutions. • Jointly develop IoT-enabled waste management, AI, partnerships, segregation, recycling, and waste-to-energy projects. 	<ul style="list-style-type: none"> •Swachh Bharat Abhiyan: Launched in 2014; National initiative for a clean and open defecation-free India. •Challenges: insufficient funding, infrastructure limitations, limited public engagement. •Waste-to-Energy Policy: Promotes waste utilization for energy generation. •Challenges: high capital costs, lack of citizen awareness, environmental pollution concerns. 	<ul style="list-style-type: none"> •: Collaborate with the EU to adopt and implement the EU Waste Management Directive, which could help address challenges in the Swachh Bharat Abhiyan and Waste-to-Energy Policy.
	EU/EFTA	<ul style="list-style-type: none"> • Integrate "IoT-Enabled Waste Management Systems" with "Green IoT for Eco-Friendly Smart Cities" for efficient waste management. • AI in waste management: Enhances waste-to-energy, optimizes smart bins, enables sorting robots, improves waste models, tracks waste, aids plastic pyrolysis, streamlines logistics, prevents illegal dumping, boosts resource recovery, and promotes smart cities for efficiency and public health. 			
Smart Water Management	INDIA	<ul style="list-style-type: none"> •Urban Water Monitoring System: Andhra Pradesh advances Smart Water Grid tech. •Smart Water Future: Coimbatore innovates water management with Germany. •Digitalization: Digital infrastructure combats India's water crisis. •Smart management curbs water waste. •Smart Meter-Based System: Smart meters optimize water distribution in cities like Chandigarh and Pune. 	<ul style="list-style-type: none"> • Create India-EU/EFTA Water Innovation Hub for smart water cooperation. • Partner on Water 4.0 R&D, digital infrastructure, and smart metering. • India could collaborate with EU/EFTA for implementing Water Framework Directive in India. • Raise awareness and engage stakeholders for water conservation. 	<ul style="list-style-type: none"> • AMRUT 2.0 Vision: Strives for 'Water Secure Cities' through urban water and wastewater management; Ministry of Urban Development identifies 24 key 'smart cities.' • Challenges include a lack of comprehensive understanding and development strategies for water sector advancement. 	<ul style="list-style-type: none"> • India can take insights from EU's Water Framework Directive, Urban Waste Water Directive and Horizon 2020 Framework to focus on better water protection, management and efficiency.
	EU/EFTA	<ul style="list-style-type: none"> • EU/EFTA's Water-Futures project for UN Agenda 2030 water equity. • EU/EFTA's sustainable approach via Water Framework Directive (WFD) • Water Management Digitalization: European Commission's smart water tech strategy. • EU/EFTA's future smart water projects for AMI systems. • Water 4.0: Digital water management evolution. 			



GAPS-CHALLENGES, FUTURE POTENTIAL & RECOMMENDATIONS

		FUTURE POTENTIAL	RECOMMENDATIONS	GAPS & CHALLENGES	RECOMMENDATIONS
Smart Meter Lighting	INDIA	<ul style="list-style-type: none"> Consumer resistance to energy-efficient developments is decreasing, EESL is helping in the development. India needs more smart grid for rising electricity demand. Tech like AI can cut losses, improve billing, and monitor power network inefficiencies. 	<ul style="list-style-type: none"> India and EU/EFTA unite for renewable energy smart grid, fast-tracking smart meter adoption through funding and knowledge sharing. 	<ul style="list-style-type: none"> India's Smart Meter Rollout: Government targets 250 million smart meters by 2025. Challenges include consumer acceptance and skills gap, but EESL and states are driving developments. Power companies like Adani Energy Solutions, Tata Power, and Torrent Power are actively implementing smart metering projects. Rapid adoption with numerous companies securing orders and announcing plans. Anticipated challenges for these companies involve operational efficiency and grid balancing. 	<ul style="list-style-type: none"> Learning from EU/EFTA's 50%+ smart meter penetration for India's 250 million target.
	EU/EFTA	<ul style="list-style-type: none"> The EU/EFTA's Smart Cities Marketplace focuses on integrating and advancing city infrastructures. Public lighting, using over 20% of city energy, is transitioning to energy-efficient LEDs and smart lighting. 		<ul style="list-style-type: none"> Endesa started deploying smart meters with 40% coverage in 2019, funded by the European Investment Bank. Challenges in integration and communication with various smart meters, data concentrators, and Head End Systems (HES). European Commission's report on smart metering progress. Targets include 200 million smart electricity meters and 45 million gas meters by 2020, with a potential €45 billion investment. Challenges related to Member States' criteria, regulations, interoperability, data privacy, and security. Over 50% of European electricity meters are now smart, driven by increased investments in grid modernization. 	<ul style="list-style-type: none"> India's experience overcoming resistance can benefit EU/EFTA's lagging states.
Public Safety Surveillance	INDIA	<ul style="list-style-type: none"> Indian Smart Cities invest in surveillance tech for public safety. Technologies like facial recognition, drones, and body cameras enhance safety. Promote women's rights and safety in Indian cities. Study on smart city safety systems is underway 	<ul style="list-style-type: none"> India, EU/EFTA could invest in advanced surveillance tech. Develop open info-sharing platform for public services. Use AI, facial rec, biometrics, drones for safety. Explore EU/EFTA's S4AllCities project collaboration with India. Rights-based approach for women's city safety; Build public safety risk management framework.. 	<ul style="list-style-type: none"> Growing demand for safe city projects in India, focusing on public safety. Successful deployment of surveillance and smart city projects, utilizing video surveillance and central control rooms. The Smart Cities Mission (SCM) was launched in 2015 to enhance life in 100 Indian cities and towns. Surveillance investments have been made, but progress is uneven due to administrative, financial, and technology-related challenges. Increasing adoption of biometric surveillance for facial recognition in public places. Challenges include data privacy and security concerns. Biometric surveillance raises privacy and data protection concerns. 	<ul style="list-style-type: none"> India can collaborate with EU by leveraging EU's experience in security management, cybersecurity, Privacy and risk estimation.
	EU/EFTA	<ul style="list-style-type: none"> Create open platform for info sharing in smart city. S4All Cities enhances city infrastructure and security info exchange. Study on early warning systems for smart city safety. 		<ul style="list-style-type: none"> Cities employ various technologies for public safety: facial recognition, biometrics, police cameras, drones, and crowdsourcing. OEM's initiative uses LTE technology and IoT for urban public security. Risk-based security, cybersecurity, behavior tracking, risk estimation, and crisis management. Smart cities pose political, technical, and socioeconomic challenges due to their complex and interconnected nature. Video surveillance faces issues: inefficiency, blind spots, and low-quality imagery. Data-related challenges: storage, retrieval, delays in incident reporting, and data loss. Aims to enhance city infrastructures, ICT systems, and security in smart spaces, improve public safety and surveillance using digital grids and data-driven solutions for safer urban environments. Challenges related to data processing and management. 	<ul style="list-style-type: none"> India's advancements in smart city projects could guide EU's efforts to enhance urban resilience.

GAPS-CHALLENGES, FUTURE POTENTIAL & RECOMMENDATIONS



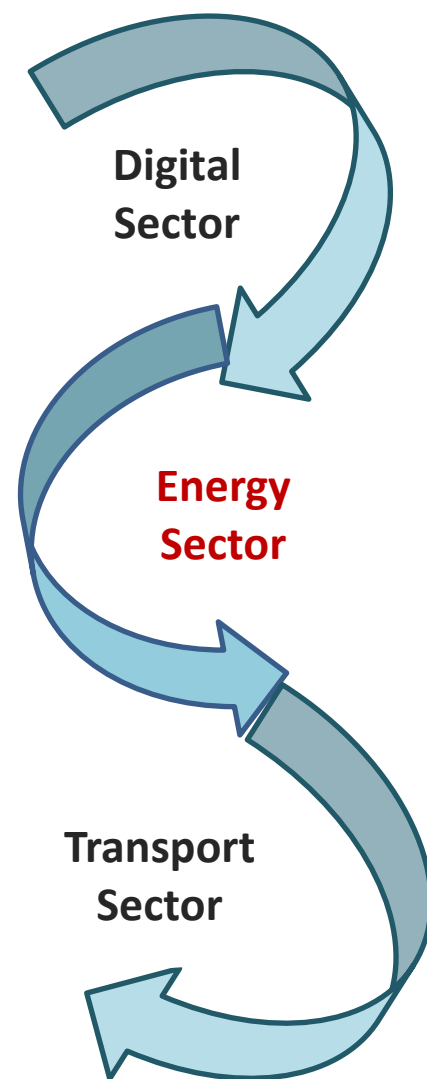
		FUTURE POTENTIAL	RECOMMENDATIONS	GAPS & CHALLENGES	RECOMMENDATIONS
Data Analytics And Urban Planning	INDIA	<ul style="list-style-type: none"> AI transforms data analytics, automating tasks, while 5G pushes analytics to the edge; India's Finance Minister promotes sustainable cities with a 1.103 billion Euros fund and creditworthiness initiatives. 		<ul style="list-style-type: none"> SCM launched in 2015 to enhance life in 100 Indian cities, It explores Big Data for data-driven smart city services and crucial applications. The complex nature of smart cities poses political, technical, and socioeconomic challenges. The project examines GIS's role in Indian smart city urban planning. Rapid urbanization in India demands effective governance with high-quality, timely data. Challenges include facing uneven progress due to administrative, financial, and technology. 	<ul style="list-style-type: none"> The EU/EFTA's expertise in urban data platforms could benefit India's smart cities mission, data analytics and Urban Planning
	EU/EFTA	<ul style="list-style-type: none"> EDM Monitoring Tool enhances EU data market insights. Data Governance Regulation aims for EU data revolution. SUD Strategies foster sustainable EU urban growth. EU allocates 8% ERDF for member state SUD projects. 	<ul style="list-style-type: none"> India and EU could collaborate in AI-driven data analytics with EU's EDM Tool; Automation boosts data analytics, cuts costs. 5G-edge computing speeds up analysis. EU Data Governance Regulation may inspire India. EU's creditworthiness model helps India's urban dev. 	<ul style="list-style-type: none"> Smart Cities & Urban Mobility seeks sustainable solutions using AI, encompassing energy, water, waste, and pollution. Aims to provide urban data platforms to 300 million Europeans by 2025. Urban Data Platforms (UDPs) integrate data using interoperable standards, with 70% of cities adopting these standards. Building trust between private and public sectors is vital for effective data utilization; Urban Computing's role is analyzed in strategic, short-term, and joined-up planning for data-driven, sustainable cities. Recognizes the complexity of sustainable cities due to unpredictability, contestations, conflicts, and contingencies in decision-making. Challenges include digital transformation obstacles and key issues regarding technology, data reliability, third-party reliance, skills, ethical AI, and complex regulation. 	<ul style="list-style-type: none"> India's use of big data to solve urban issues could guide EU's strategies for sustainable and inclusive cities.

MARKET DYNAMICS (ENERGY SECTOR)

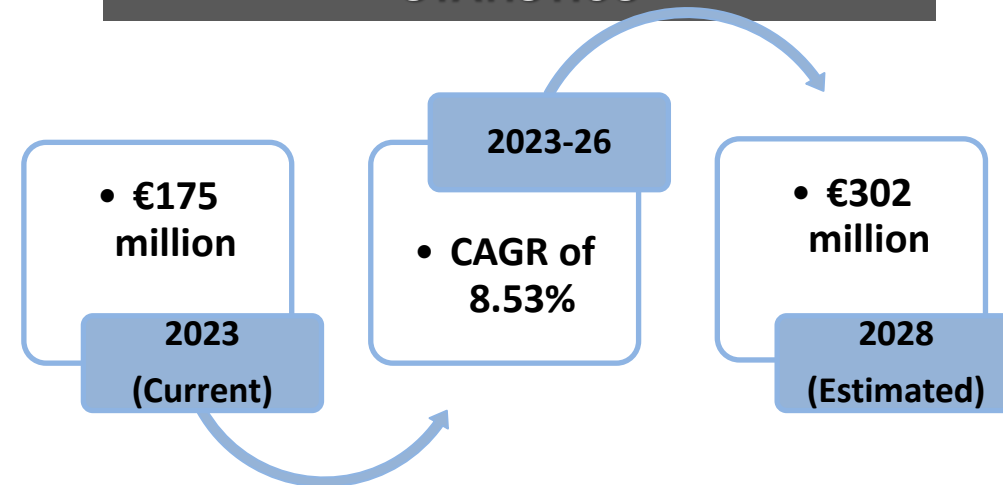


The central idea driving the digital transformation of both the EU/EFTA and India is a focus on "human-centric digitalization for fostering inclusive economies and societies." In their July 2020 summit, these two entities concurred on advancing worldwide digitization standards that prioritize secure and ethical implementation.

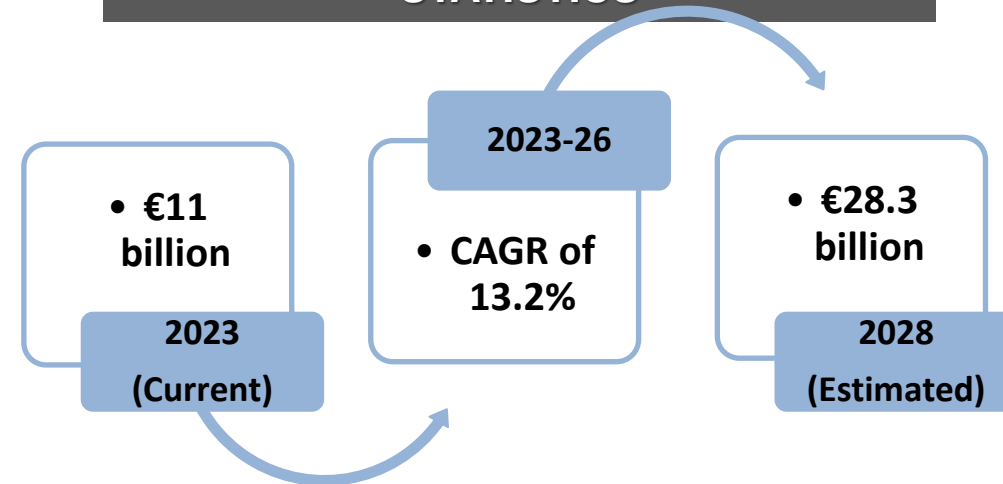
MAJOR DIVISIONS OF CONNECTIVITY



INDIA ENERGY MANAGEMENT STATISTICS



EU/EFTA ENERGY MANAGEMENT STATISTICS



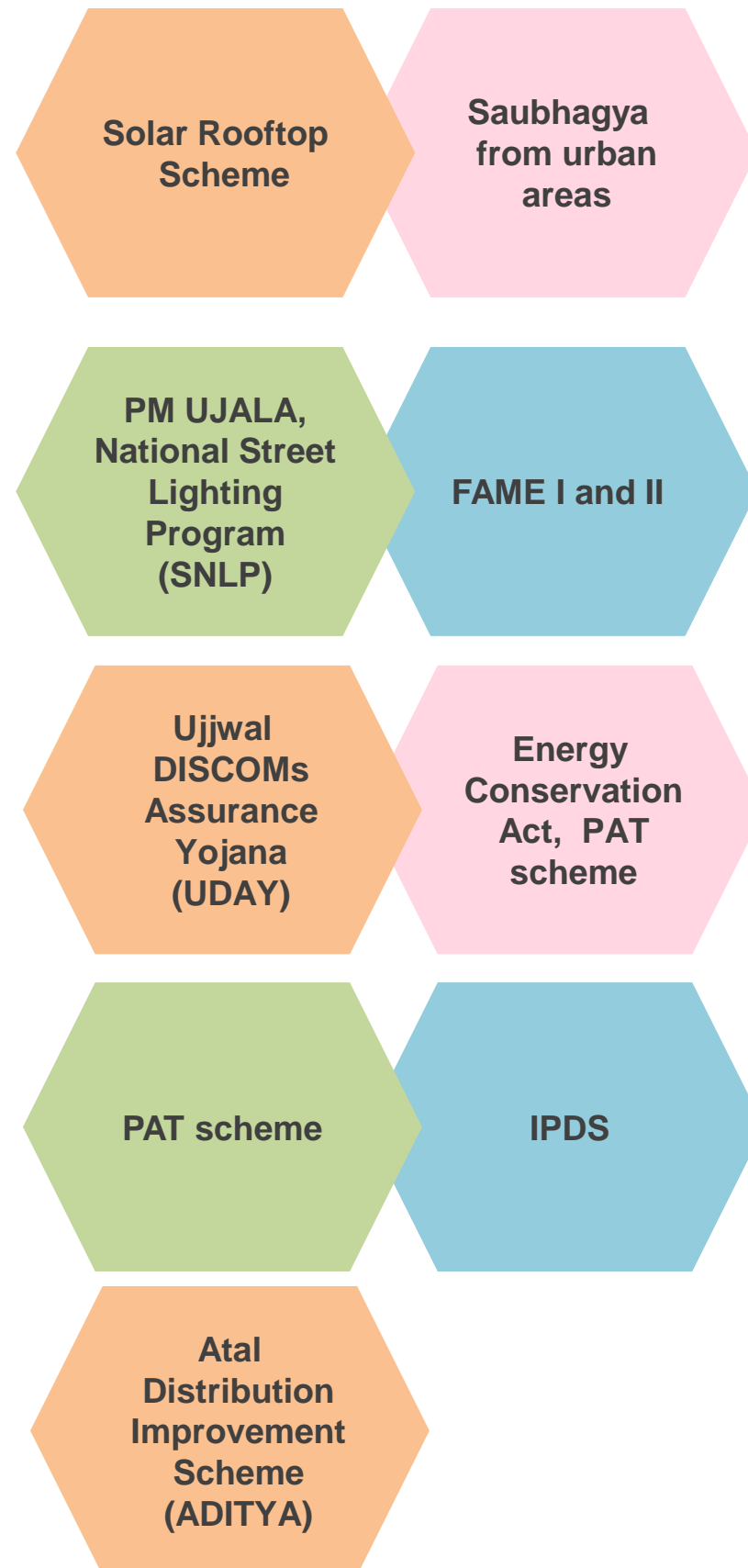
KEY GROWTH STATISTICS

CATEGORY	EU/EFTA	INDIA
Grid Mix	Dominance of renewables 38% renewables; 25% nuclear; 20% coal	Coal-reliant 54% coal; surging renewables at 24%; nuclear 2%; hydro 13%
Increasing Trends	Wind and Solar	Wind and Solar
Decreasing Trends	Phasing out of coal in many countries	Gradual decrease of non-renewables due to policy shifts and commitments
Primary Sectors	Industrial (42%); Residential (25%); Transportation(20%)	Industrial (40%); Residential (24%); Agricultural(18%)
Future Trends	Accelerated transition to renewables; smart grids	Rapid growth in renewables; alternative fuels, energy storage
Business Potential	Investment opportunities and innovation in renewable energy	Renewable integration in solar and wind energy projects, electronic mobility
Policy Focus	EU Green Deal, EU Horizon	National Solar Mission, FAME I and II
International Collaboration	Common Energy Market, Cross Border Connectivity	Bilateral Agreements, Technological Collaborations

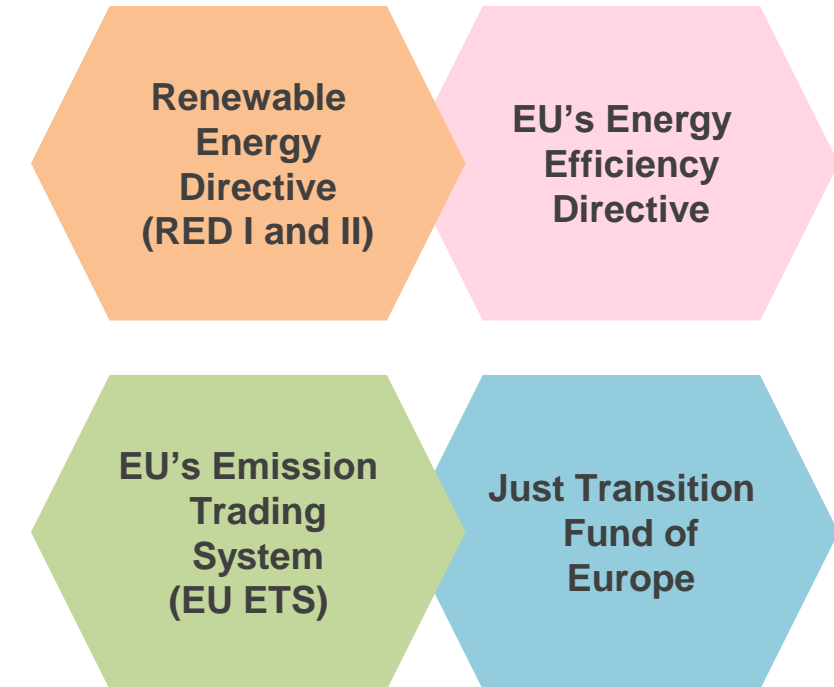
POLICY INITIATIVES (ENERGY SECTOR)



INDIA POLICIES



EU /EFTA POLICIES



INDIA- EU/EFTA COMBINED POLICIES

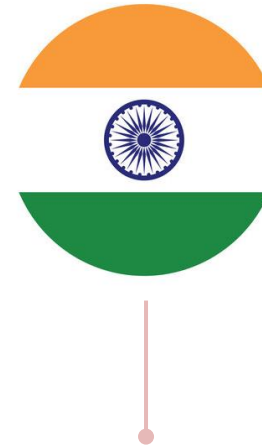
ENERGY CONNECTIVITY IN SMART CITIES

Geography	Policy Name	Policy Description
INDIA- EU/EFTA Policy Collaborations	EU-India Partnership on Smart and Sustainable Urbanization	The partnership brings together under a long-term cooperation platform all relevant stakeholders: European and Indian institutions, EU member states and Indian states, EU and Indian cities, businesses and civil society, to address challenges arising from rapid urbanization in India
	Eco-cities India Program	Eco-Cities India is a multi-year technical advisory program under the EU-India Cooperation on Clean Energy and Energy Efficiency. This climate-change focused program is structured around five cities - Bengaluru, Bhubaneswar, Chennai, Mumbai Metropolitan Region, and Pune Metropolitan Region.



STANDARDISATION (ENERGY)

BIS, IGBC, GRIHA



INDIA

ETD-13: Equipment for Electrical Energy Measurement and Load Control (Smart Meter): ETD 13 is responsible for preparing standards for equipment for electrical energy measurement, tariff - and load control, customer information, payment, local and/or remote data exchange, using electromechanical and/or electronic, technologies for applications ranging from electrical energy generation to residential.

ETD 46: Grid Integration: ETD 46 is responsible for preparing standards in the field of Grid Integration comprising of LT (ON Grid, Off Grid and Hybrid with and without storage), HT and EHT for all capacities.

ETD 50: LVDC Power Distribution Systems: ETD 50 is responsible for preparing standards on: LVDC System Requirements, Safety and Installation Guidelines, LVDC products including electrical wiring accessories and Applications, Integration of DC Infrastructure and Non-Traditional Distribution Networks/Microgrids.

LITD 10: Power system Control and associated Communications for promotion of Indian Standards relating to Power system control equipment and systems including EMS (Energy Management System), DMS (Distribution Management System), SCADA (Supervisory Control and Data Acquisition) d) Distribution automation, Smart Grid, tele-protection and associated communications used in planning, operation and maintenance of power systems.

CENELEC AND OTHER STANDARDS



EU/EFTA

CEN-CENELEC-ETSI Coordination Group on Smart Grids (CG-SG): The CG-SG advises on European standardization requirements relating to smart electrical grid and multi-commodity smart metering standardization, including interactions between commodity systems (e.g. electricity, gas, heat, water), and assesses ways to address them.

CLC/TC 57: Power systems management and associated information exchange- It is responsible for developing international standards for power systems control equipment and systems.

CLC/TC 13: Electrical energy measurement and control: Standardization in the field for metering equipment and systems (using whenever possible IEC standards), including smart metering systems, for electrical energy measurement, tariff- and load control, customer information and payment, for use in power stations, along the network and at energy end users, as well as to prepare international standards for meter test equipment and methods.

The Energy Performance of Buildings Directive: Adopted in 2002 (revised in 2018) aims to decarbonize European building stock fully by 2050. The European Green Deal, and the Circular Economy Action Plan as part of it calls for a "Renovation Wave" along with ensuring affordability. The Energy Efficiency Directive requires central governments of the member countries to renovate 3% of the total floor area of buildings owned/occupied. It aims to increase the share of renewable energy in the total energy mix. The Waste Framework Directive (2008) aims to achieve 70% recovery target for construction and demolition waste.

EU energy label: IT was introduced in 2021, shifting from A+, A++, A+++, etc. to an A-G scale so that only a few products could receive the "A" rating, making room for more efficient future products. It provides information about a product's energy efficiency with a dark green rating indicating highest efficiency and least CO2 emissions and red rating for vice-versa. The label also displays water usage, noise levels, etc. Products with The European Ecolabel signifies that it has undergone an independent evaluation and determined to satisfy stringent environmental standards, the Energy Saving Trust Recommended logo indicates that the product is among the most efficient, and the Energy star label on office tools is also an indication of the product meeting the EU's efficiency standards.

FUTURE POTENTIAL & RECOMMENDATIONS



		FUTURE POTENTIAL	RECOMMENDATIONS
GREEN BUILDINGS	INDIA	<ul style="list-style-type: none"> • GRIHA and LEED-India: Popular green building rating systems in India. • Suzlon One Earth (Pune), BCIL (Bangalore), Rajiv Gandhi Airport, Infosys Limited (Mysuru): Buildings with these green certifications. 	<ul style="list-style-type: none"> • India can adopt EU's DGNB principles for balanced green building standards. • EU's DGNB considers environmental, social, and economic aspects equally. • Indian standards emphasize specific parameters: air, water, and waste.
	EU/EFTA	<ul style="list-style-type: none"> • BREEAM, DGNB, HQE, and LEED are common green building rating systems in Europe. • Examples include The Edge in Amsterdam which is a sustainable working space, The Viikki Village in Helsinki which is a sustainable residential area 	
ELECTRICITY STORAGE	INDIA	<ul style="list-style-type: none"> • Batteries and Pumped Hydro Storage: Battery storage projects and pumped hydro storage are gaining attention. For example, the National Thermal Power Corporation (NTPC) has been working on energy storage solutions, including a 10 MW battery energy storage system in the Andaman and Nicobar Islands • Scaling Up Battery Storage: There is considerable potential for scaling up battery storage projects, especially as the costs of batteries continue to decrease. This can enhance grid stability and support the integration of more renewable energy. • Extended Producer Responsibility principle holds producers accountable. • Producers collect, recycle, and reuse materials in new batteries. • Dumping of batteries in landfills 	<ul style="list-style-type: none"> • More and more integration of renewable powered micro grids in India and EU. • Invest in grid scale energy storage like pumped hydroelectric, compressed air energy storage etc. • Decentralization of energy storage systems. • Financial incentives, tax credits and subsidies for innovative energy storage solutions along with R&D. • There is scope for Cross-Border Cooperation in the EU for electricity storage. This will lead to more efficient utilization of resources. This could involve standardized regulations and interconnections to facilitate the movement of stored energy across borders. • Continued investment in research and development is essential for advancing energy storage technologies. Innovation can lead to breakthroughs in battery technologies, making them more efficient and cost-effective
	EU/EFTA	<ul style="list-style-type: none"> • Advanced Grids: The EU has been investing in smart grids to accommodate the increasing share of renewables. Battery storage, along with other storage technologies, plays a crucial role in enhancing grid flexibility and reliability. • Rapid Growth in Battery Storage: The EU has been witnessing rapid growth in battery storage installations. Various countries, including Germany and the Netherlands, have implemented large-scale battery projects to support renewable energy integration. 	
ENERGY MANAGEMENT	INDIA	<ul style="list-style-type: none"> • Indian government establishes smart metering infrastructure. • EESL's Smart Meter National Programme replacing 250 million meters. • Smart meters help manage peak demand and offer time-based tariffs. • BSES Rajdhani Power Limited initiates India's first Home Energy Reports (HERs) pilot program in New Delhi. 	<ul style="list-style-type: none"> • Implement Demand response programs (DRPs) for voluntary electricity reduction during peak demand periods to enhance grid reliability and promote energy efficiency in smart cities. • Prioritize and enhance standardized communication protocols and data formats to improve interoperability among diverse energy management systems in Indian and European smart cities.
	EU/EFTA	<ul style="list-style-type: none"> • EU energy conservation plan in REPowerEU aims to reduce gas demand by 15% in July 2022 and to lower electricity use by 5% to 10% in September 2022 • Building energy efficiency based on directives like Energy Performance of Buildings, Renovation Wave, Ecodesign, and Energy Labelling. 	

GAPS-CHALLENGES & RECOMMENDATIONS



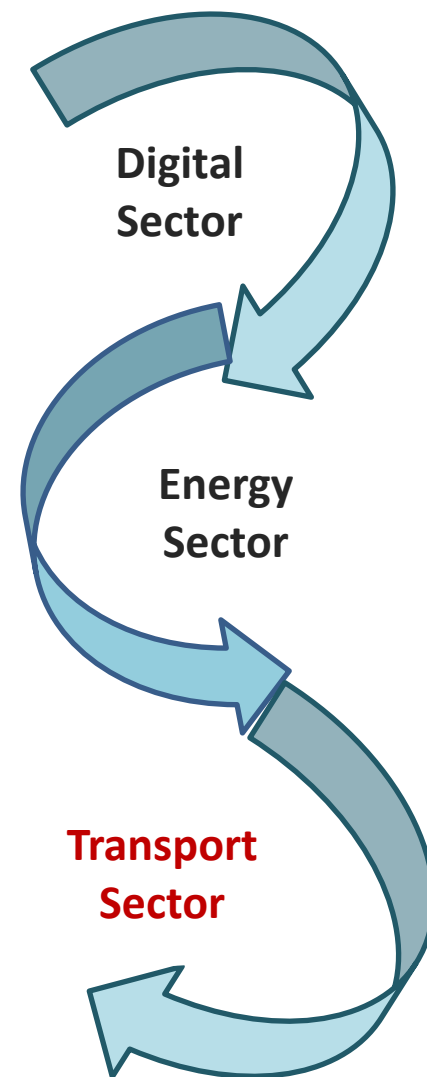
		GAPS & CHALLENGES	RECOMMENDATIONS
ENERGY EFFICIENT BUILDINGS	INDIA	<ul style="list-style-type: none"> • BEE's Energy Conservation Building Code (ECBC): Measures and rates buildings based on its energy performance while taking into consideration parameters like climatic region. • Incentives, such as tax breaks and faster approvals, are provided for builders and developers incorporating energy-efficient technologies in their projects. • Strengthened and further existing ratings like GRIHA and LEED 	<ul style="list-style-type: none"> • Leveraging Internet of Things (IoT): Encourage the integration of IoT devices for real-time monitoring and control of energy consumption in buildings, enabling adaptive energy management systems. • Green Financing Schemes: Introduce and promote green financing schemes that offer favorable terms for developers and homeowners investing in energy-efficient building technologies. • Public Awareness Campaigns: Launch campaigns to raise awareness among citizens about the long-term benefits of energy-efficient buildings, emphasizing comfort, cost savings, and environmental sustainability.
	EU/EFTA	<ul style="list-style-type: none"> • EU's Energy Performance of Buildings Directive, which sets out the minimum energy performance requirements for new and existing buildings, promoting energy efficiency in the building sector. • Many EU countries have implemented programs like the Green Building Council's certification systems to recognize and promote energy-efficient building practices 	
SMART GRIDS AND ENERGY MANAGEMENT	INDIA	<ul style="list-style-type: none"> • National Smart Grid Mission aims to modernize the electricity grid by integrating advanced technologies for real-time monitoring, better load management, and reduced losses. • Policies such as time-of-day pricing and demand response programs have been introduced to incentivize consumers to shift their energy consumption to off-peak hours. 	<ul style="list-style-type: none"> • Cross-Border Interoperability: Encourage standardization and interoperability of smart grid technologies across borders to facilitate the seamless exchange of energy data and resources between neighboring regions. • Community Engagement Programs: Implement community-based programs to raise awareness about smart grids, involving citizens in demand-side management and promoting energy conservation practices. • Investment in Resilience: Invest in resilient smart grid infrastructure to withstand cybersecurity threats and natural disasters, ensuring uninterrupted energy supply in smart cities. • Continued collaboration and exchange for interoperability of standards
	EU/EFTA	<ul style="list-style-type: none"> • SET Plan (Strategic Energy Technology Plan) promoting research and innovation in smart grids. • EU's Clean Energy for All Europeans Package supports the development of smart grids and intelligent energy management systems for enhancing the flexibility and reliability of the energy system. • In countries like Germany, smart grid initiatives integrate renewable energy sources and enable more efficient demand-side management 	
RENEWABLE ENERGY INTEGRATION	INDIA	<ul style="list-style-type: none"> • India's National Action Plan on Climate Change includes the National Solar Mission with a target of 20,000 MW of grid connected solar power. • Policies like Renewable Purchase Obligations (RPOs) mandate a certain percentage of energy consumption from renewable sources, encouraging the integration of renewable energy into the grid. 	<ul style="list-style-type: none"> • Incentives for Distributed Energy Resources (DERs): Provide financial incentives and regulatory support for the integration of distributed energy resources, such as residential solar panels and community-based renewable projects. • Smart Contracts and Blockchain: Explore the use of smart contracts and blockchain technology to enable transparent and automated transactions in the renewable energy market, fostering trust among producers and consumers. • Flexibility Mechanisms: Develop flexibility mechanisms, such as energy storage and demand response programs, to balance the intermittency of renewable sources and enhance the reliability of the energy grid.
	EU/EFTA	<ul style="list-style-type: none"> • Renewable Energy Directive: A latest target of 42.5% renewable energy in grids is set for 2030. • Feed-in Tariffs and premium schemes in various EU countries provide financial incentives for renewable energy producers, promoting the growth of wind, solar, and other clean energy sources. 	

MARKET DYNAMICS (TRANSPORT SECTOR)

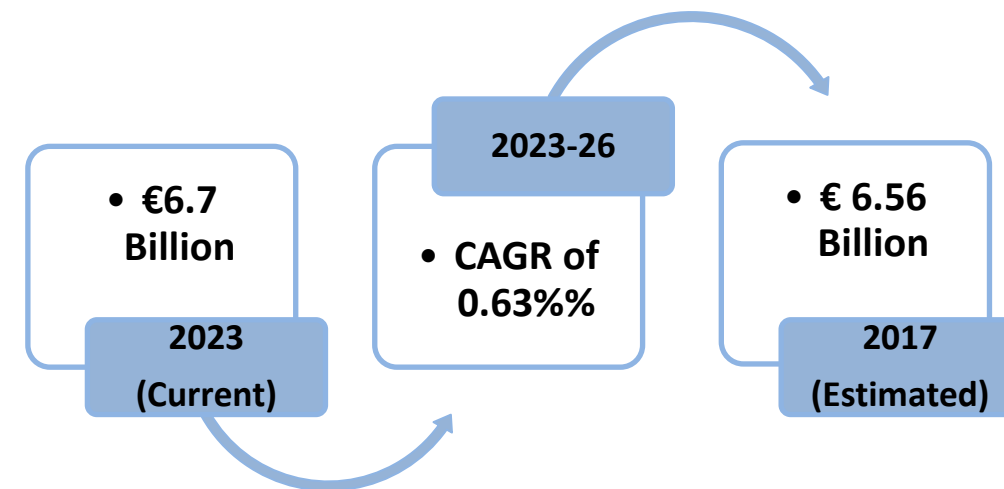


India's smart city transportation is shifting toward sustainability and tech innovation. While EU, smart city transportation prioritizes green mobility, advanced tech, and autonomous vehicle testing.

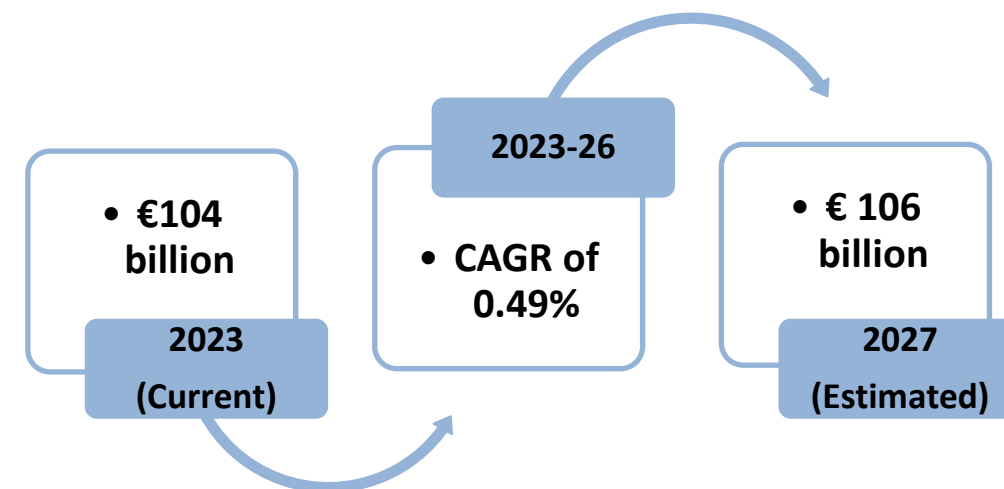
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INDIA REVENUE STATISTICS



EU/EFTA REVENUE STATISTICS



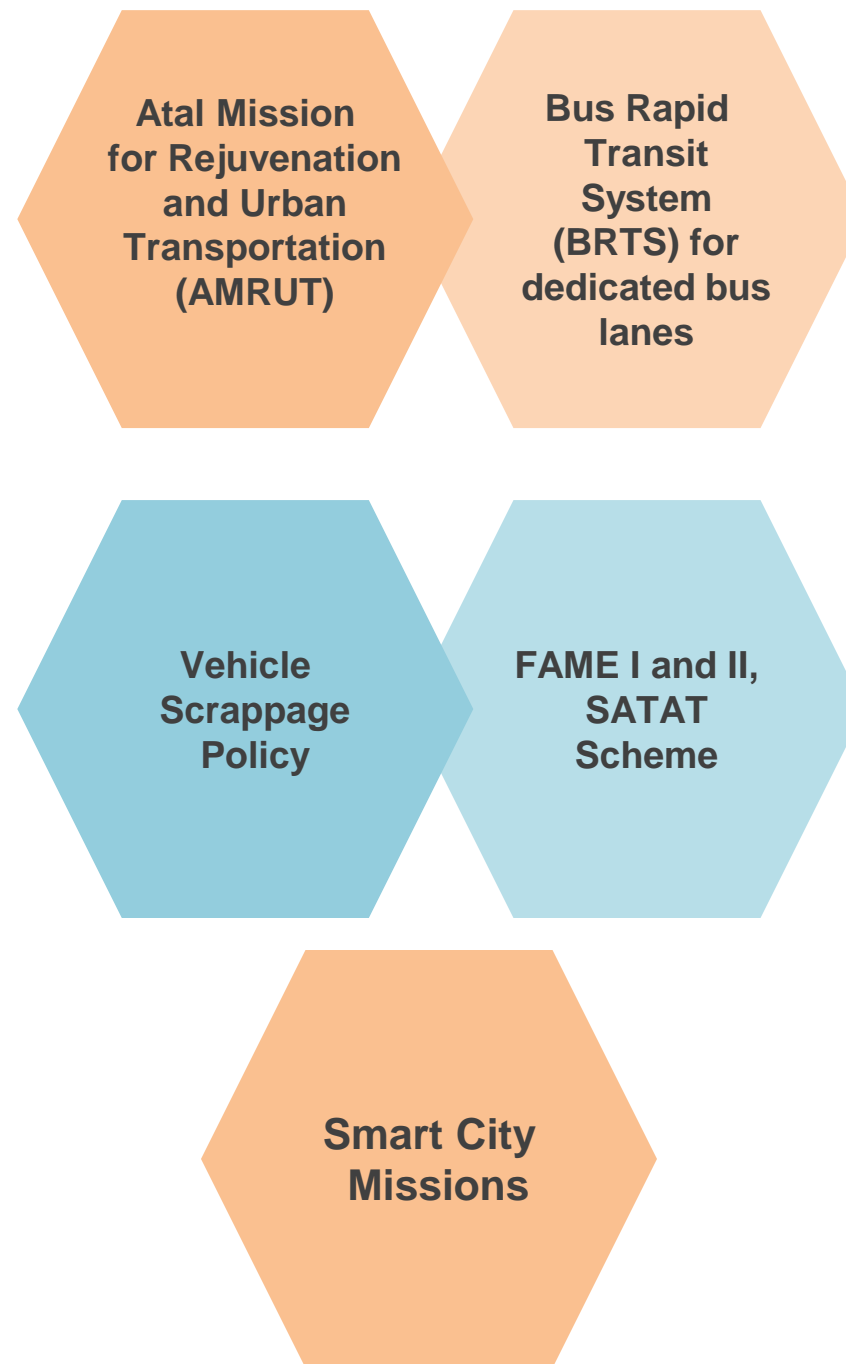
KEY GROWTH STATISTICS

CATEGORY	EU/EFTA	INDIA
Fuel Types	Diesel (37%); Petrol (25%); Electric (3.2%); Natural gas (2.1%)	Petrol (70%); Diesel (23%); Electric (0.1%); CNG (6%); Biofuels (0.1%)
Increasing Trends	Rapid adoption of EVs supported by incentives	Significant growth of EVs due to government incentives
Decreasing Trends	Decline in diesel vehicles due to promotion of EVs	Gradual reduction of ICE vehicles due to promotion of EVs
Alternatives Fuels	Biofuels and Hydrogen	CNG, Compressed biogas and hydrogen
Infrastructure	Dense network specially of charging infrastructure specially in urban areas, good network for non motorized travel	Expanding charging infrastructure, non motorized travel infrastructure needs improvement
Future Trends	Autonomous vehicles testing and implementation efforts	Mass Rapid Transit system/Multi modal transit in urban agglomerations
Business Potential	Charging infrastructure, Autonomous vehicles	Electric Buses, Battery storage, Hydrogen, CBG
Policy Focus	Emission reduction	Sustainable urban mobility

POLICY INITIATIVES (TRANSPORT SECTOR)



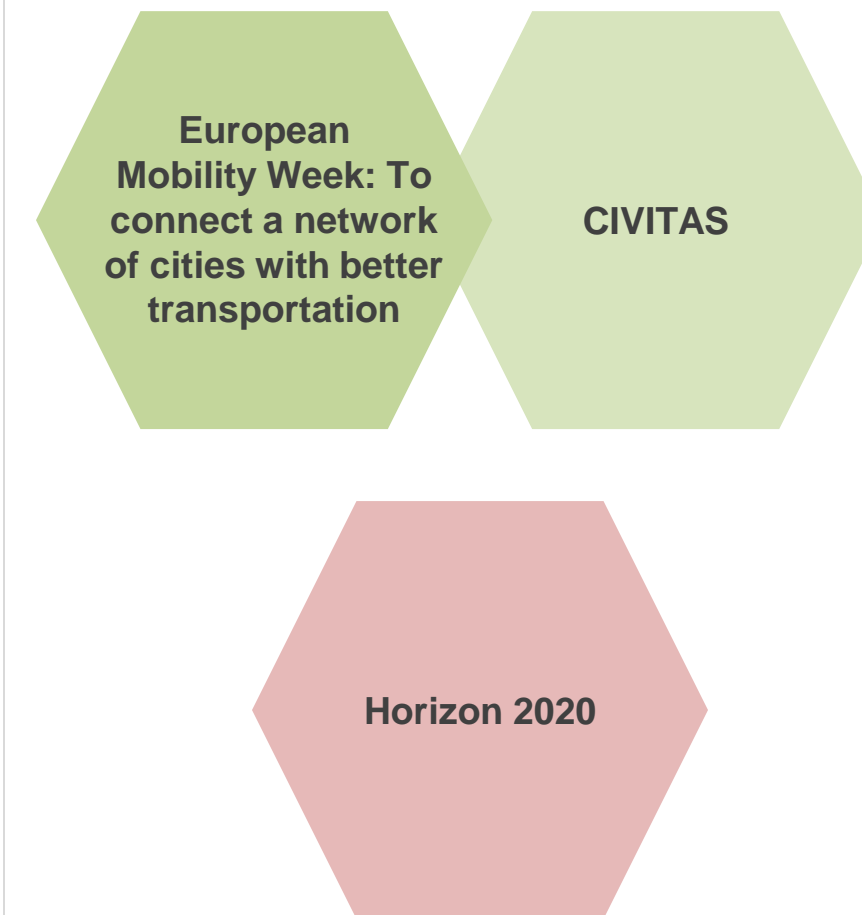
INDIA POLICIES



INDIA- EU/EFTA COMBINED POLICIES RECOMMENDATIONS

INDIA- EU/EFTA COMBINED POLICIES RECOMMENDATIONS		
ENERGY CONNECTIVITY IN SMART CITIES		
Geography	Policy Name	Policy Description
INDIA- EU/EFTA Policy Collaborations	Interoperable Smart Transport Systems	Develop joint standards and protocols for smart transportation systems to ensure interoperability between Indian and EU smart cities. Establishing common standards for technologies such as Intelligent Transportation Systems (ITS), connected vehicles, and traffic management systems will facilitate seamless integration and data exchange between smart cities in India and the EU.
	Urban Mobility Innovation Hubs	Establish collaborative innovation hubs in select smart cities, bringing together researchers, startups, and industry stakeholders from India and the EU to work on cutting-edge urban mobility solutions. By fostering joint research and development efforts, innovation hubs can accelerate the creation of sustainable and inclusive urban mobility solutions.

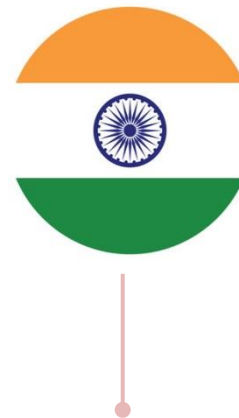
EU/EFTA POLICIES





STANDARDISATION (TRANSPORT)

BIS, BHARAT STAGE, CAFE STANDARDS



INDIA

TED 27 on Electric and Hybrid Vehicles is responsible for standardization of Electric and Hybrid vehicles and their components. It is national mirror technical committee of ISO/ TC 22/SC 37 and IEC/ TC 69. Please click [here](#) for the list of standards developed by TED 27.

ETD 51 on Electrotechnology in mobility is responsible for standardization of electrotechnical aspects of totally or partly electrically propelled road vehicles. Click [here](#) for the list of standards published by ETD 51.

TED 28 on Intelligent Transport Systems: is responsible for Standardization of information, communication and control systems in the field of urban and rural surface transportation, including intermodal and multimodal aspects thereof, traveller information, traffic management, public transport, commercial transport, emergency services and commercial services in the intelligent transport systems, Co-ordination of work with ISO/TC 204 excluded in-vehicle transport information and control systems (ISO/TC 22) and ISO/TC 241

Emissions Standards: In India, these are called the Bharat Stage emissions standards (BSES) were introduced in 2000 following Supreme Court's order. These standards were directly taken from Euro norms that prevailed then. Currently BS VI norms are applicable in India on all new cars sold and registered after 1st April 2020.

CAFE Standards: Automotive manufacturers in India need to ensure that the per kilometer emissions of a particular fleet of their vehicle must be below the set standards. The benchmark is established using the kerb weight of the average fleet.

CENELEC AND OTHER STANDARDS



EU/EFTA

CENELEC: TC 69X: Electrical systems for electric road vehicles: TC 69X is responsible to prepare European standards related to electrical systems for road vehicles, totally or partly propelled from self-contained power sources.

CLC/TC 23BX: Switches, boxes and enclosures for household & similar purposes, plugs & socket outlets for d.c & for the charging of electrical vehicles including their connectors.

CEN/TC 278 'Intelligent Transport Systems': Standardization in the field of intelligent transport systems, encompassing services and techniques to achieve road safety, environmental sustainability and traffic efficiency, and to improve the travel experience; applying information and communication technologies between vehicles/infrastructure/other road users. It included: aspects of cooperation (C-ITS); intermodality and multimodality; traffic management; mobility information; mobility integration; mobility as a service; systems and services for vulnerable road users; ITS services for automated vehicles; parking management; user fee collection; public transport management; eCall; after-theft vehicle recovery systems; kerbside and pavement management. Mobility accessibility for all users is an important aspect of ITS standardization.

FUTURE POTENTIAL & RECOMMENDATIONS (TRANSPORT SECTOR)



		FUTURE POTENTIAL	RECOMMENDATIONS
SHARED PUBLIC MOBILITY	INDIA	<ul style="list-style-type: none"> • MoRTH issues guidelines for liberalizing taxi permits and promoting vehicle sharing services. • National policies like the Urban Transport Policy, Data Sharing Policy, and Motor Vehicles Amendment Bill aim to enhance mobility services in India. • Initiatives like differentiated toll plaza charges. • The "Chalo Pay" app facilitates direct payments to conductors with as little as RS. 10 recharge 	<p>India:</p> <ul style="list-style-type: none"> • Efficiently manage existing transportation infrastructure in India, enhancing station areas and prioritizing first/last-mile connections to public transport. • Accelerate the shift to e-buses and EVs in India with incentives and expanded charging infrastructure for sustainability. • More use of renewable fuel sources like biogas, biodiesel and ethanol. <p>EU:</p> <ul style="list-style-type: none"> • The European Parliament can assist members with national mobility policies through funding, policy support, capacity development, or linking funding eligibility to rural mobility policy development. • Empower local communities to lead initiatives and harmonize regulations for walking and cycling networks. • Improve mobility services by investing in cross-border public and shared mobility services. • Increase EV adoption, implement digital ticketing solutions, and raise awareness of public mobility benefits.
	EU/EFTA	<ul style="list-style-type: none"> • Shared scooters in Europe: Increasingly regulated via public tenders with varying outcomes • Successful tenders: Clear criteria, transparency, quality standards • Tenders can limit vehicle numbers and operators • Bordeaux and Oslo examples: Improved profitability and service quality • Personalized services: User preferences and trip specifics considered • Multiple routing options for time-cost comparison • Flexible payment options: Irregular users and subscription bundles 	
EV AND ALTERNATIVE FUEL VEHICLES	INDIA	<ul style="list-style-type: none"> • Electronic mobility in India drives lithium-ion battery demand • 6,586 public charging stations in India • BEE's app locates nearest EV charger • No license needed for charging under Electricity Act, 2003 • Rs. 1,000 Cr. allocated for charging infrastructure in FAME-India Phase II • 2,877 EV charging points in 25 states/UTs approved • 1,576 charging stations on 9 expressways and 16 highways approved • Ministry of Power allows home/workplace charging • MoHUA updates Model Building Bye laws, 2016 for charging stations • Biogas production hasn't reached expected levels even after five years of SATAT. 	<p>India:</p> <ul style="list-style-type: none"> • Offer financial incentives (e.g., reduced GST rates) for EV affordability • Rapidly expand charging infrastructure, especially along highways • Establish consistent regulatory frameworks for EVs nationwide. • Explore alternative fuels like biogas with rural feedstock <p>EU:</p> <ul style="list-style-type: none"> • Harmonize EV incentives across member states • Standardize charging protocols • Invest in R&D for alternative fuel sources • Promote awareness of EV and alternative fuel benefits • Encourage public-private partnerships for cleaner transportation solutions
	EU/EFTA	<ul style="list-style-type: none"> • Lithium-ion batteries dominate European storage additions. • EU leads in EV adoption with 375,000 charging outlets in 2021. • Norway initiated tax incentives for EVs in the 1990s. • Alternative Fuels Infrastructure Directive (2014) boosts charging facilities. • 2018 Energy Performance of Buildings Directive mandates recharging points in certain buildings. • CO2 Emission Regulation 2020 supports green initiatives. 	

FUTURE POTENTIAL & RECOMMENDATIONS (TRANSPORT SECTOR)



		FUTURE POTENTIAL	RECOMMENDATIONS
CYCLING AND WALKING (NON MOTORIZED TRANSPORTATION)	INDIA	<ul style="list-style-type: none"> • Gov promotes cycling and walking through the "Green Mobility Scheme." that aims to enhance connectivity, safety, and accessibility for pedestrians and cyclists. • National challenges with ITDP encourage innovative walking and cycling solutions. • Pune's Complete Street scheme, guided by ITDP, transformed 100+ km of pedestrian and cyclist-friendly streets. • JM Road and DP Road's redesign in Pune received national recognition and awards. • Pimpri-Chinchwad also began designing 75 km of pedestrian-friendly streets. 	<ul style="list-style-type: none"> • Strengthen public health professionals' awareness to promote cycling for better health. • Promote cycling benefits through education from early childhood. • Integrate non-motorized transport in India's city planning for cleaner, multi-modal commuting.
	EU/EFTA	<ul style="list-style-type: none"> • Pan-European Master Plan for Cycling Promotion recommends allocating space for cycling and walking • Suggests improving active mobility infrastructure • Advocates for increasing cyclist and pedestrian safety • Encourages the development of national cycling policies • Promotes integration of cycling into health and urban planning • Paris Mayor's 2022 Traffic Restriction Plan: <ul style="list-style-type: none"> • Restricts vehicle traffic in city center to reduce pollution and noise • Prioritizes walking and cycling • Exceptions for residents, people with disabilities, and essential services • Expected to cut 55% of daily traffic (over 100,000 cars) • Allocates 50% of on-street parking to pedestrians and cyclists • Establishes a 650km cycle network • Prior actions include banning diesel cars and expanding sidewalks 	
INTELLIGENT TRAFFIC MANAGEMENT	INDIA	<ul style="list-style-type: none"> • ODAWS, BSPS, and CoSMiC launched under Ministry's ITS Phase-II initiative. • ODAWS: Real-time audio and visual alerts for driver assistance. • ODAWS: Monitors driver behavior and vehicle environment. • BSPS: Improves public bus handling at signal-controlled junctions. • BSPS: Conditional priority, not blind priority like emergency vehicles. • CoSMiC: Middleware software for vendor-specific standards. • CoSMiC: Enhances interoperability with smart city dashboard. 	<ul style="list-style-type: none"> • Indian traffic management firms should look for tailored and local solutions. • Widespread adoption of ITS can revolutionize traffic management, enhance flow, save fuel, and promote sustainability. • AI insights enable smarter urban mobility, benefiting the environment and the public. • India needs national ITS guidelines for local requirements. • Robust data infrastructure and secure data management are vital for effective traffic management and mass ITS deployment.
	EU/EFTA	<ul style="list-style-type: none"> • European Parliament and Council agree on revised ITS Directive for data availability. • Revised ITS Directive includes automated mobility, booking, ticketing, multimodal info, and vehicle-infrastructure communication. • New regulations set deadlines for critical services and digitization of data like speed limits. • Benefits for users: real-time info, intelligent road infrastructure, precise speed assistance. • Updated guidelines promote Cooperative ITS for vehicle-road communication. 	

GAPS-CHALLENGES & RECOMMENDATIONS (TRANSPORT SECTOR)



		GAPS & CHALLENGES	RECOMMENDATIONS
SMART PARKING SYSTEM	INDIA	<ul style="list-style-type: none"> Strengthened the Smart Cities Mission in India, which has initiated projects for smart parking systems in various cities. For example, the city of Pune has implemented a mobile app-based parking system to provide real-time information on parking availability and facilitate cashless transactions. Further encouraging the integration of digital payment systems to promote cashless transactions and reduce congestion around parking areas. 	<ul style="list-style-type: none"> Integration of Multi-Modal Transportation: Encourage seamless integration between parking systems and other modes of transportation, such as public transit and vehicle-sharing, to provide citizens with a holistic mobility experience. Dynamic Pricing Models: Implement dynamic pricing for parking spaces based on demand, time of day, and events to optimize usage and reduce congestion during peak hours. Data Privacy and Security Measures: Strengthen data privacy and security measures to ensure that user information in smart parking systems is protected from unauthorized access.
	EU/EFTA	<ul style="list-style-type: none"> The European Union has been promoting sustainable urban mobility through initiatives like the Green Deal, which emphasizes the reduction of emissions and the use of digital technologies for efficient urban transport. Various cities in the EU, such as Amsterdam and Barcelona, have implemented smart parking solutions that utilize sensor technologies to guide drivers to available parking spaces, reducing traffic congestion. 	
TRAFFIC MANAGEMENT AND OPTIMIZATION	INDIA	<ul style="list-style-type: none"> The Intelligent Traffic Management System (ITMS) must be implemented in various Indian cities under the Smart Cities Mission. This involves the use of technologies like adaptive traffic signal control systems to optimize traffic flow. Policies in India must be focused on the development of dedicated lanes for buses and the promotion of non-motorized transport to reduce traffic congestion. 	<ul style="list-style-type: none"> Real-time Traffic Information: Enhance the availability of real-time traffic information to citizens through mobile apps and digital displays to enable informed decision-making on route choices. Collaboration with Private Sector: Encourage partnerships with private companies for the development of innovative traffic management solutions, such as predictive analytics for traffic patterns. Public Awareness Campaigns: Conduct public awareness campaigns to educate citizens about the benefits of using public transport and alternatives to private vehicle use.
	EU/EFTA	<ul style="list-style-type: none"> The EU has been investing in Intelligent Transport Systems (ITS) to improve traffic management. Cities like Copenhagen have implemented smart traffic lights that prioritize public transport and cyclists, reducing overall congestion. Learn from policies implemented elsewhere like congestion pricing to discourage private vehicle use during peak hours, thereby reducing traffic and emissions. 	
ELECTRIC AND SUSTAINABLE MOBILITY	INDIA	<ul style="list-style-type: none"> Boost to the Faster Adoption and Manufacturing of Hybrid and Electric Vehicles (FAME) scheme in India, which provides incentives for the adoption of electric vehicles (EVs). Cities like Delhi have implemented electric buses to reduce air pollution. Incentives for EV charging infrastructure development are being provided to promote the growth of electric mobility. Expansion of Vehicle Scrappage Policy 	<ul style="list-style-type: none"> Charging Infrastructure Expansion: Accelerate the expansion of EV charging infrastructure in both urban and peri-urban areas to alleviate range anxiety and encourage widespread adoption of electric vehicles. Incentives for Sustainable Modes like alternative sustainable modes of transport, such as cycling and walking, to promote healthier and environmentally friendly commuting options. Public-Private Partnerships: Foster public-private partnerships to develop and maintain sustainable mobility infrastructure, ensuring the involvement of both government bodies and private enterprises in building a comprehensive and accessible transportation network. Uniform global standards for charging infrastructure, combined research on energy storage
	EU/EFTA	<ul style="list-style-type: none"> The EU has set ambitious targets for reducing CO2 emissions from transport, with a focus on promoting electric mobility. Incentives for EV purchases, along with stringent emissions standards, should be furthered.. Promotion for more and more non-motorized transport infrastructure: Many European cities, including Amsterdam and Oslo, have developed comprehensive cycling infrastructure and pedestrian-friendly zones to reduce dependence on motorized transport. 	



DATA PRIVACY & CYBERSECURITY



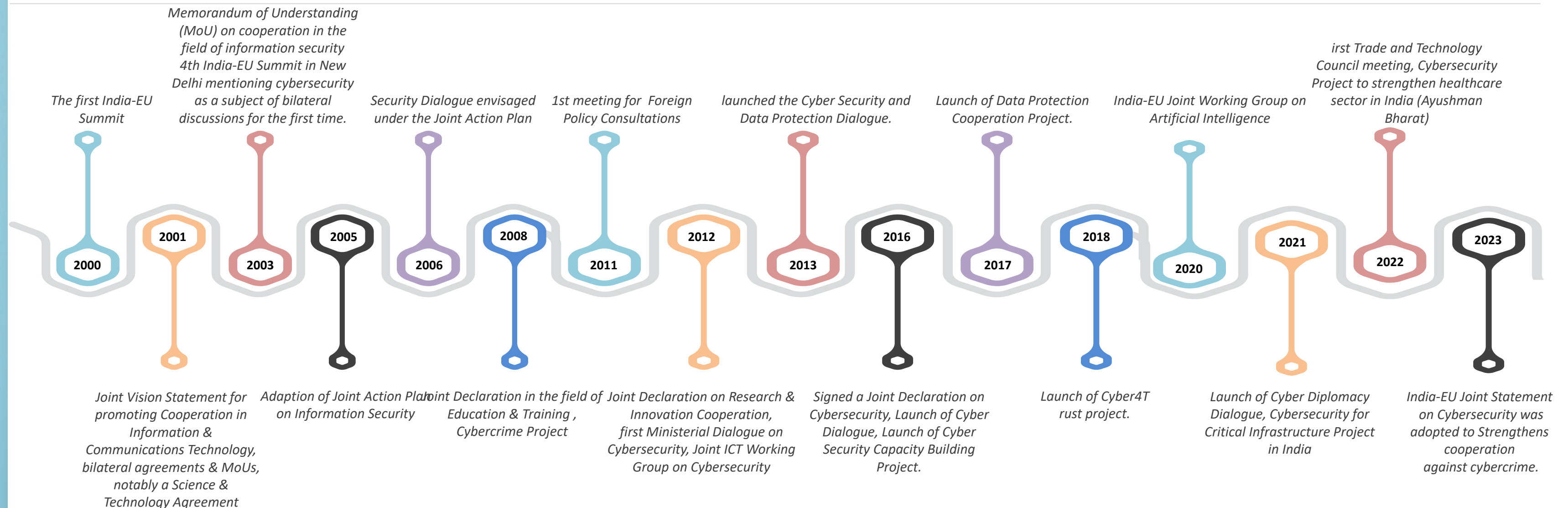
INTRODUCTION & TIMELINES

In the era of digital revolution, where enormous volumes of personal information are gathered, saved, and handled, cybersecurity and data privacy have become crucial issues.

The amount of personal data being gathered and kept has increased dramatically as more and more elements of our life become digital. This includes private data like surfing history on the internet, financial details, and medical records. Malicious actors and cybercriminals are always coming up with new ways to take advantage of holes in networks and computer systems to access personal information without authorization. These dangers include sophisticated data breaches, malware assaults, and phishing scams

While cybersecurity protects computer systems and networks from illegal access, alteration, or destruction, data privacy focuses on preventing unlawful access to, use of, or exposure of an individual's personal information.

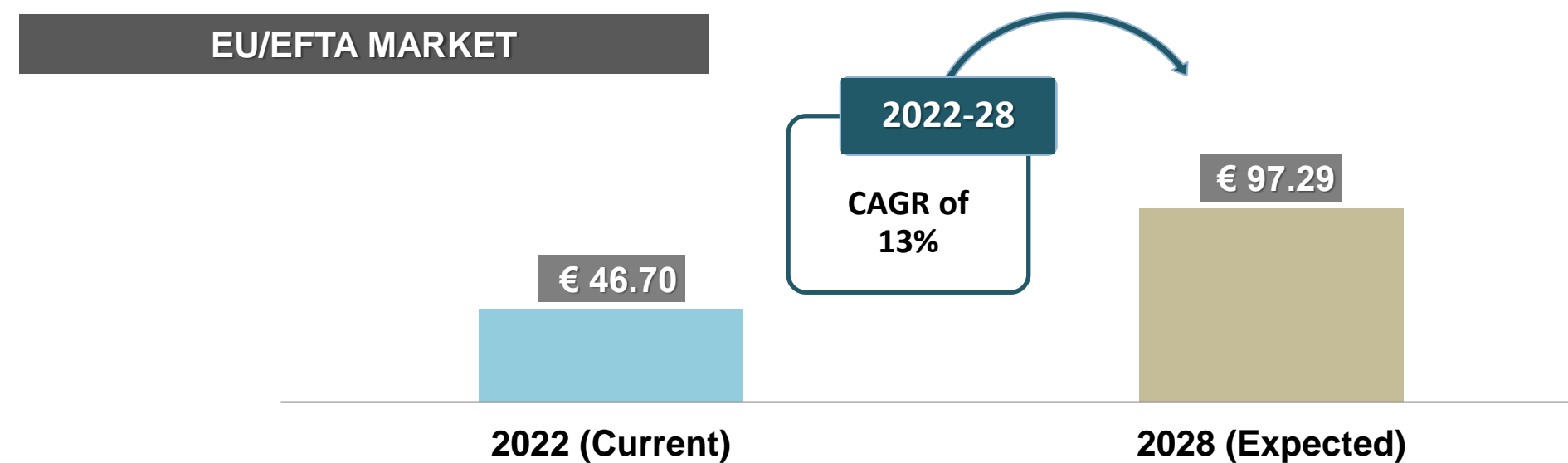
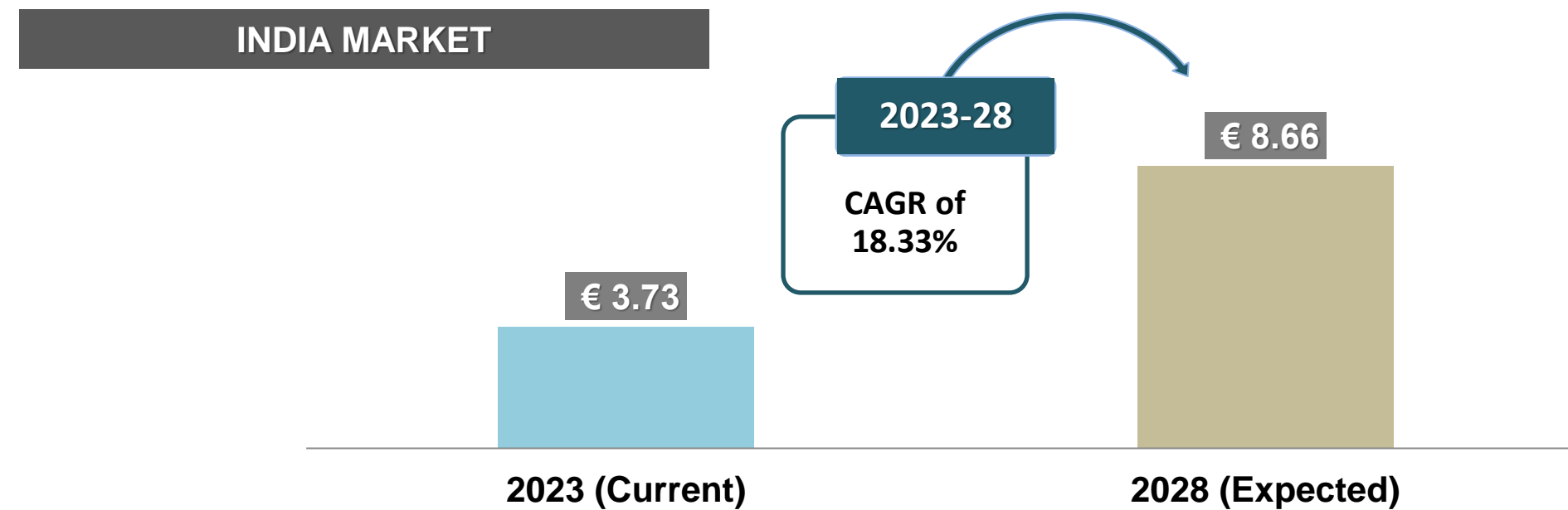
Not only are data privacy and cybersecurity technological concerns, but they are also pressing human rights and business needs. Maintaining people's liberty, privacy, and dignity requires protecting their personal information. Maintaining public confidence in digital technologies, encouraging innovation, and safeguarding the integrity of vital infrastructure all depend on cybersecurity.



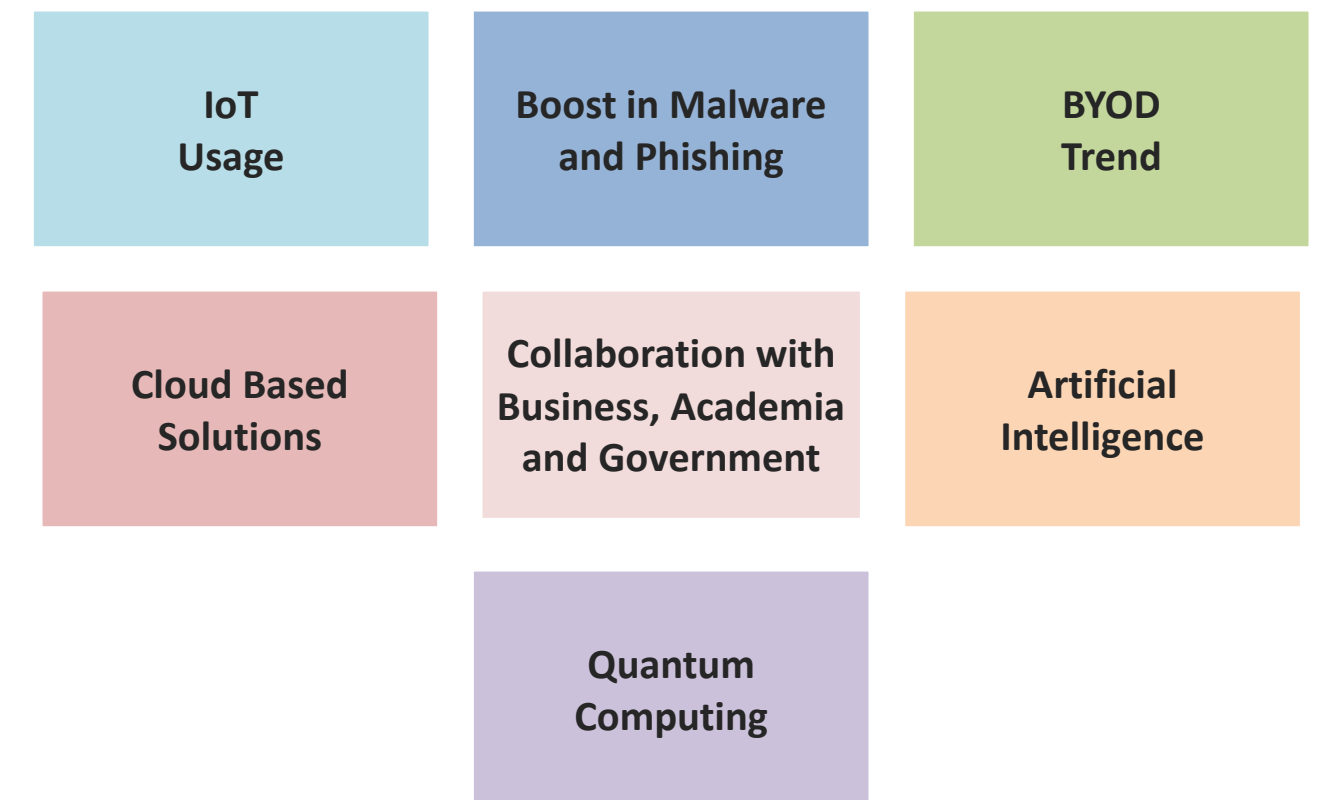
MARKET DYNAMICS



- The global Cyber Security market size was valued at 169,037 million EUR in 2022 and is expected to expand at a CAGR of 14.82% during the forecast period, reaching 387,39 million EUR by 2028. Market expansion is predicted due to rising mobile device usage, secure authentication, and changes in antivirus software.
- Below mentioned are industry's Current and Expected Revenue Growth w.r.t both countries, along with key growth drivers.



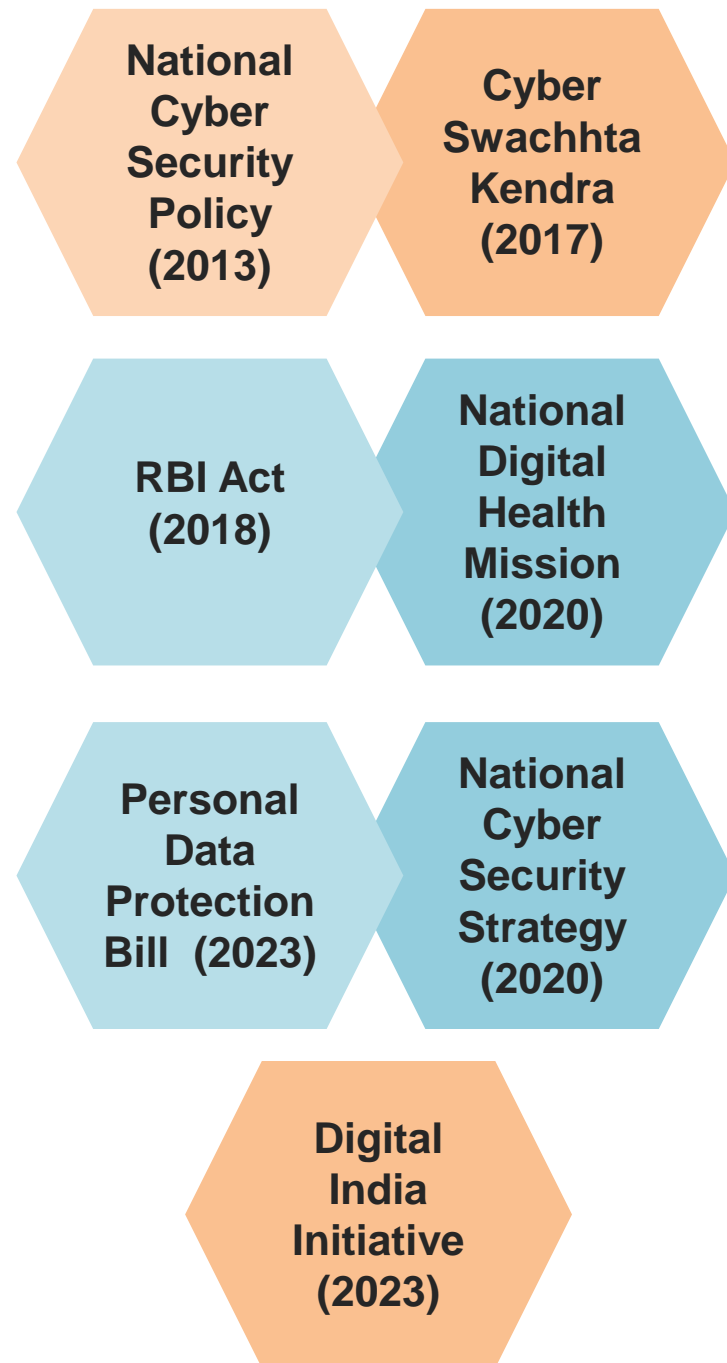
KEY GROWTH DRIVERS



POLICY INITIATIVES



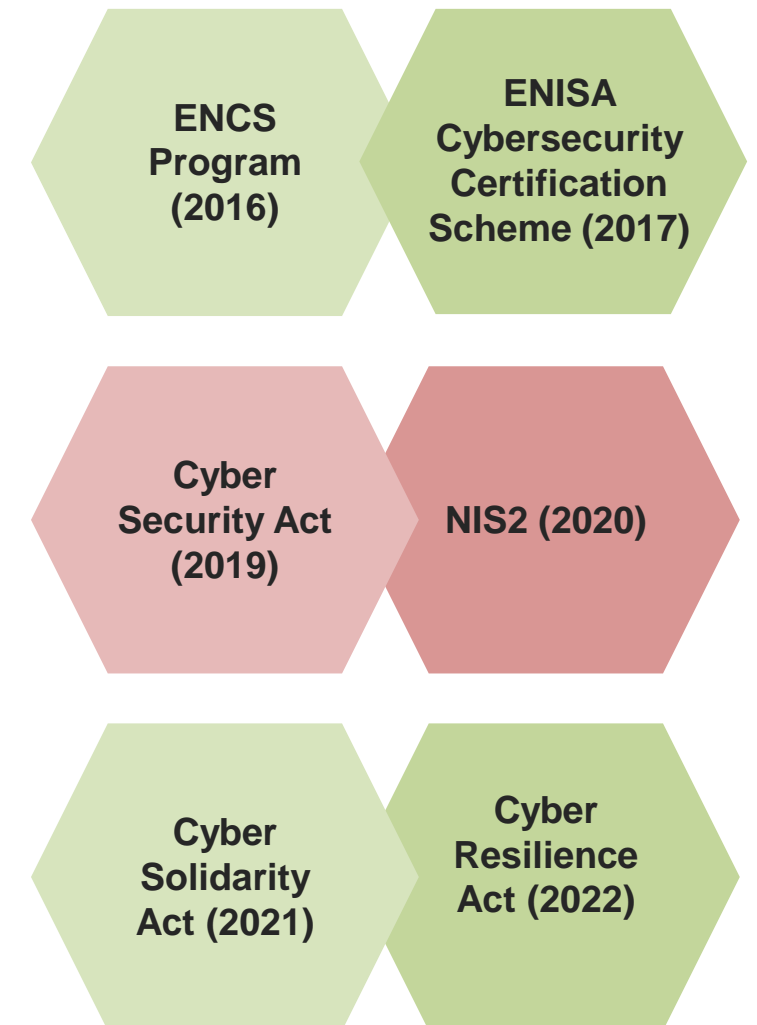
INDIA POLICIES



INDIA- EU/EFTA COMBINED POLICIES

Policy Name	Policy Description
INDIA-EU /EFTA POLICIES COLLABORATION	EU-India Think Tank Twinning Initiative (2018) Initiative to promote joint research on cybersecurity issues.
	NCL & ENISA MoU (2018) Memorandum of Understanding (MoU) between NCL and ENISA to foster collaboration on cybersecurity standardization and capacity building.
	Cybersecurity Partnership Framework (2020) A set out a roadmap for future cooperation.
	Trade and Technology Council (TTC) (2022) India and the EU established the EU-India Trade and Technology Council , which includes a working group on cybersecurity.
	Joint cybersecurity training program (2023) This program will train Indian cybersecurity professionals on the latest cybersecurity technologies and best practices.

EU/EFTA POLICIES





STANDARDISATION

BIS, LITD



INDIA

BIS has the following technical committees that are responsible for developing standards related to Data Privacy & Cyber Security

BIS LITD 17 on Information Systems Security and Privacy: BIS through its technical committee "LITD 17 on Information systems security and privacy" is developing standards in the field of Security and Privacy aspects of Information Systems. LITD 17 is the national mirror committee for ISO/IEC TC-JTC 1 SC-27 (P) on Information security, cybersecurity and privacy protection. Please click here for the list of standards published by LITD 17.

- **ISO 27000** series of Information Security standards
- **BIS ETD 18:** Industrial Process Measurement And Control
- **IS/IEC 62443-4-2 : 2019-** Security for Industrial Automation and Control Systems Part 4 Sec 2 Technical Security Requirements for IACS Components

ETSI, CEN, JTC, CLC, EN IEC, CEN



EU/ EFTA

ETSI technical committee on Cyber-Security (TC Cyber): ETSI TC Cyber is responsible for developing standards in the area of security of ICT systems and networks, specifically network infrastructures, devices, services, and protocols etc. ETSI TC CYBER works closely with stakeholders to develop standards that increase privacy and security for organizations and citizens across Europe and worldwide.

- **ETSI TS 103 928 V1.1.1 (2023-07):** Cyber Security (CYBER); Cyber Security for Home Gateways; Conformance Assessment of Security Requirements as vertical from Consumer Internet of Things
- **ETSI TR 103 949 V1.1.1 (2023-05):** Quantum-Safe Cryptography (QSC) Migration; ITS and C-ITS migration study
- **ETSI TR 103 621 V1.2.1 (2022-09):** Guide to Cyber Security for Consumer Internet of Things
- **ETSI TR 103 823 V1.1.1 (2021-09):** CYBER; Quantum-Safe Public-Key Encryption and Key Encapsulation.

CEN-CENELEC/JTC 13 'Cybersecurity and data protection' sets out application guidelines for data protection and privacy for security technologies, systems and services. Its primary objective is to transport relevant international standards (especially from ISO/IEC JTC 1 SC 27) as European Standards (ENs) in the Information Technology (IT) domain. It also develops 'homegrown' ENs, where gaps exist, in support to EU regulations (RED, eIDAS, GDPR, NIS, etc.). These two streams of activities aim at creating a strategic portfolio of standards in Europe, which fits the European needs. CEN-CLC/JTC 13 works closely with ENISA (The European Union Agency for Cybersecurity) in the context of the European certification schemes, and with the European Commission, in the frame of the cybersecurity-related standardization request under the Radio Equipment Directive (RED).

- **EN ISO/IEC 27000 series of standards for Information technology** - Security techniques
- **CEN/CLC/TS 17880:2022:** Protection Profile for Smart Meter - Minimum Security requirements
- **EN 17529:2022:** Data protection and privacy by design and by default
- **EN 17640:2022:** Fixed-time cybersecurity evaluation methodology for ICT products
- **EN 17927:2023:** Security Evaluation Standard for IoT Platforms (SESIP). An effective methodology for applying cybersecurity assessment and re-use for connected products.

CLC/TC 65X 'Industrial-process measurement, control and automation' is the other main provider of cybersecurity-related standards in the Operational Technology (OT) domain. It prepares standards for systems and elements used for industrial process measurement, control and automation.

EN IEC 62443 series of standards for Operational Technology (OT) found in industrial and critical infrastructures, including but not restricted to power utilities, water managements systems, healthcare and transport systems.

CEN/TC 114 'Safety of machinery', which produces standards and other documents on general principles for the safety of machinery, including terminology and methodology has developed a TR on the impact of cybersecurity for machines safety: ISO/TR 22100-4:2020 Safety of machinery - Relationship with ISO 12100 - Part 4: Guidance to machinery manufacturers for consideration of related IT-security (cyber security) aspects (ISO/TR 22100-4:2018).

Cybersecurity standards are also being developed in several vertical sectors, for example: CEN/TC 301 'Road Vehicles', CEN/TC 377 'Air-traffic management', CLC/TC 9X 'Electrical and electronic applications for railways', CLC/TC 57 'Power systems management and associated information exchange', CEN-CLC/JTC 19 'Blockchain and Distributed Ledger Technologies', CEN/TC 224 'Personal identification and related personal devices', CLC/TC 45AX 'Instrumentation, control and electrical power systems of nuclear facilities'.



STANDARDISATION

BILATERAL AGREEMENTS



INDIA

- India's National Cyber Security Agency (NSCSA) established in 2013
- Coordinates cybersecurity efforts.
- Develops guidelines and standards.
- Increases cybersecurity risk awareness.



EU/EFTA

- The EU/EFTA has implemented cybersecurity measures, including the Cybersecurity Strategy adopted in 2016 and the establishment of cybersecurity bodies like the European Union Agency for Cybersecurity (ENISA).



RECOMMENDATIONS

- India and the EU/EFTA should collaborate on mutually beneficial areas and explore new technologies like artificial intelligence & blockchain to enhance standardization cooperation. Additionally, enhancing cooperation between law enforcement agencies to combat cybercrime is crucial for bringing cyber attack perpetrators to justice.

INTERNATIONAL AND REGIONAL ORGANIZATIONS



INDIA

- India's ISO and IEC Standards Adoption
- ISO 27001: Information technology security techniques and management systems.
- IEC 62443-4-1: Industrial automation and control systems cybersecurity requirements for smart grid applications.



EU/EFTA

- EU/EFTA's Cybersecurity Framework
- Adopts ISO and IEC standards.
- Develops its own NIS Directive.
- Requires critical infrastructure operators to implement cybersecurity measures.



RECOMMENDATIONS

- The Bureau of Indian Standards (BIS) and the European Committee for Standardization (CEN-CENELEC) could work together to develop joint cybersecurity standards and/or cooperate at the global platform ISO/IEC/JTC1 on this subject

IDENTIFY THE NEED FOR COMMON STANDARDS



INDIA

- Indian Cyber Security Framework Overview
- Developed by MeitY for cybersecurity risk assessment, mitigation, and response.
- Indian Computer Emergency Response Team (CERT-In) coordinates response and promotes cybersecurity awareness.



EU/EFTA

- Cybersecurity Act and ESO Roles
- Adopted in 2019, sets cybersecurity certification framework for ICT products, services, and processes.
- EU Agency for Cybersecurity promotes cybersecurity standards and supports Act implementation.
- ESOs like CEN, CENELEC, and ETSI develop technical cybersecurity standards.
- CERT-EU is a member of CEN and ISO.



RECOMMENDATIONS

- Participation in International Standardization Bodies for Global Cybersecurity Standards
- India and EU/EFTA should join ISO, IEC, ITU, 3GPP, oneM2M.
- This aids in global cybersecurity standards development.
- Facilitates ICT product and service movement, reducing business burden.

POLICY & STANDARDISATION



INDIA

- "India's Cyber Security Agency (CSAI) Overview"
- Coordinates cybersecurity efforts.
- Develops initiatives like National Cyber Security Policy, 2013.
- Adheres to National Critical Information Infrastructure Protection Centre guidelines.



EU/EFTA

- "European Commission Adopts Cybersecurity Act"
- Establishes framework for network and information system (NIS) security.
- Establishes European Union Agency for Cybersecurity (ENISA).
- Provides technical and operational support to EU Member States.



RECOMMENDATIONS

- Identify areas where current Indian and EU/EFTA cybersecurity policies are compatible and develop plans for harmonization.
- This could help to enhance cybersecurity by making it more difficult for cybercriminals to exploit vulnerabilities and help to increase trust in the digital economy by ensuring that cybersecurity products and services meet common standards.



STANDARDISATION

BIS TSDSI TEC



INDIA

- Cybersecurity Standards Development in India
- BIS develops cybersecurity standards for ISMS and cyber incident response planning.
- TSDSI adopts and transposes relevant standards.
- TEC prepares reports and implements MTCTE scheme.
- TSDSI's Cybersecurity Standards cover network security, data protection, and incident response.
- TEC promotes cybersecurity innovation through workshops, training programs, awareness campaigns, and collaboration.
- TEC/DoT conducts research to identify cybersecurity threats and vulnerabilities.
- TEC develops cybersecurity standards covering network, data, and application security.



EU/EFTA

- EU-EU Standards Development and Collaboration
- ETSI-CEN-CENELEC develops EU cybersecurity standards.
- Participates in European initiatives like ENISA and ECSO.
- Contributes to new standards in ISG ICTSec meetings.
- MoU outlines collaboration areas with ENISA.
- Involved in ECSO activities for harmonized cybersecurity standards.
- Collaborates with Global SDOs and industry stakeholders.
- Organizes cybersecurity education workshops and training programs.



RECOMMENDATIONS

- Cybersecurity Standards Development
- Developing standards for emerging technologies like 5G and IoT to protect against cybercriminals.
- Promoting encryption and other security technologies to protect sensitive data.
- Cooperation between EU and Indian SDOs for standards development at 3GPP, oneM2M, ITU, ISO/IEC/JTC1.
- Operation of conformity assessment schemes like IECEE for cybersecurity certification.
- Contribution to cybersecurity standardization in India and Europe with IEC 62443, IEC 61131-3, and IEC 60870-5-101.

NQCL



INDIA

- National Quality Control Laboratory's formulates cybersecurity standards.
- Conducts cybersecurity testing and evaluation.
- Certifies cybersecurity products and services.
- Promotes cybersecurity awareness and training.
- Contributes to research and development in cybersecurity.
- Enhances cybersecurity landscape in India, promoting robust cybersecurity practices



EU/EFTA

- National Quality Certification Laboratory (NCL) Collaborates with European organizations on cybersecurity standardization.
- Focuses on sharing best practices, developing common standards, and promoting mutual certification recognition.
- Signed MoU with ENISA in 2018 for cybersecurity standardization and capacity building.
- Actively participates in ETSI's cybersecurity standardization activities, aligning Indian standards with European standards.
- Member of ECCYC, promoting mutual recognition of cybersecurity certifications.



RECOMMENDATIONS

- NQCL could use its research capabilities to help the European cybersecurity community stay up-to-date on the latest threats and to develop effective mitigation strategies.

GAPS-CHALLENGES, FUTURE POTENTIAL & RECOMMENDATIONS



		FUTURE POTENTIAL	RECOMMENDATIONS	GAPS & CHALLENGES	RECOMMENDATIONS
Data Encryption Standards	INDIA	<ul style="list-style-type: none"> Indian parliament has passed Digital Personal Data Protection Bill while the rules and timelines are under formulation at MeITY It aims to regulate the collection, use, storage, and transfer of personal data. TSDSI and TEC have collaborated on various initiatives to promote Quantum computing research and development in India. Work has also started on QKD. BIS is also handling Quantum Technologies Standardization with ISO/IEC They lack in funds, skill, knowledge and infrastructure. 	<ul style="list-style-type: none"> India's early-stage cybersecurity laws could benefit from EU/EFTA experience EU/EFTA expertise could assist in developing national-level policies Facilitating policies could boost investment in India's cybersecurity sector, including from the EU/EFTA. EU/EFTA might provide a thorough framework for standardizing QKD and sophisticated security testing techniques for QKD systems. They might also put more emphasis on QKD system physical security. India and the EU/EFTA may work together on standards and guidelines as well as best practices for defending QKD systems against physical assaults. Creating policies for incident response protocols, physical security measures, and secure location selection are all included in this. 	<ul style="list-style-type: none"> The Digital Personal Data Protection Bill (DPDP Bill), 2022, is a proposed law in India. India improving data privacy but lacks encryption R&D Compliance challenges for MeITY policy on cloud services due to weak provisions and enforcement Insufficient awareness of data encryption's importance Vital for Indian businesses and data security reputation 	<ul style="list-style-type: none"> The DPDP Bill require organizations to implement strong encryption key management practices, such as using secure key storage and access controls. Bill should encourage the use of DLP tools to prevent the accidental or intentional disclosure of personal data.
	EU/EFTA	<ul style="list-style-type: none"> Implementation of quantum-resistant encryption algorithms by governments and organizations. Protecting data from potential quantum computer attacks. Quantum computers, though in early development, pose a future encryption threat. European Network and Information Security Agency (ENISA) has identified several gaps in Quantum key distribution (QKD) standards. ETSI has standardization work ongoing around QKD CEN-CENELEC also working on Quantum Technologies Standardization activities with ISO/IEC 			
Secure Authentication Frameworks	INDIA	<ul style="list-style-type: none"> Significant opportunity for secure authentication frameworks in India. Driven by factors such as the growing digital economy and government regulations like National Cybersecurity Policy, Cybersecurity Framework, Cybersecurity Strategy, National e-Governance Plan (NeGP), Digital India Program, Aadhaar (Unique Identification Number), Data Privacy Bill Emphasis on authenticating human users in digital transactions. Achieved through environmental and behavioral analysis. 	<ul style="list-style-type: none"> Enhance credit card payment acceptance through 3D secure pay authentication. Develop a digital ID wallet considering customer preferences and identification factors Collaborate on a new framework for eIDAS and digital ID wallet. Facilitate growth in the cybersecurity market through national policies and regulations. 	<ul style="list-style-type: none"> India introduces Aadhaar for secure authentication Even with DPDP bill, data privacy and security concerns persist Bill does not explicitly mandate the use of MFA (security best practice that requires the use of two or more different factors to verify identity). Inadequate provisions in the Information Technology Act, 2000, which is undergoing its update/replacement at Meity. 	<ul style="list-style-type: none"> The DPDP Bill should develop provisions for continuous authentication, such as requiring users to re-authenticate after a certain period of inactivity or after performing high-risk transactions. This would help to prevent unauthorized users from maintaining access to a user's account.
	EU/EFTA	<ul style="list-style-type: none"> EU's NIS 2 Directive: Tighter cybersecurity rules, including secure authentication. "Trusted Identity" initiative promotes secure authentication for EU's digital security. 			

GAPS-CHALLENGES, FUTURE POTENTIAL & RECOMMENDATIONS



		FUTURE POTENTIAL	RECOMMENDATIONS	GAPS & CHALLENGES	RECOMMENDATIONS
Data Breach Response Plans	INDIA	<ul style="list-style-type: none"> Indian authorities, including CERT-In, plan to enhance data breach laws in 2023, aligning with EU/EFTA standards to strengthen India's cybersecurity. 	<ul style="list-style-type: none"> India and EU/EFTA could establish legal counsel to EU/EFTA guide government departments in breach management and defence against claims arising from the incident. 	<ul style="list-style-type: none"> CERT-In is a key player in India's cybersecurity landscape including data breach response plan. Due to lack in resources and expertise, and opaque operations, it's difficult for victim to report . 	<ul style="list-style-type: none"> While many improvements & initiatives have been put in place, CERT-In should establish a robust data breach notification mechanism that allows organizations to report data breaches quickly and efficiently.
	EU/EFTA	<ul style="list-style-type: none"> EU/EFTA may enhance data and financial security measures. Implement robust data breach response plans. Swift breach mitigation to safeguard customers and reputation. Governments with online services (e.g., tax filing, passport applications) can use these plans for enhanced security against unauthorized access. 		<ul style="list-style-type: none"> The CERT-EU is a crucial organization that plays a vital role in coordinating cyber incident response across the EU/EFTA. The absence of harmonized incident reporting standards across EU/EFTA member states makes it challenging for CERT-EU to gather and analyze data on cyber incidents in a consistent and timely manner.. 	<ul style="list-style-type: none"> CERT-EU should develop a comprehensive data breach response plan that outlines the roles and responsibilities of different stakeholders, the steps to be taken in the event of a data breach, and the communication protocols to be followed.
Privacy Impact Assessments (PIAs)	INDIA	<ul style="list-style-type: none"> For India's potential privacy issues to be successfully identified, evaluated, and mitigated, DPO participation in the PIA process is crucial. Their independence, impartiality, and experience all play a vital part in boosting PIA's efficacy and defending people's right to privacy. 	<ul style="list-style-type: none"> Enhancing the consistency and effectiveness of PIA practices among various businesses can be achieved through the creation of standardized and industry-specific PIA methods. To automate risk detection and assessment and empower enterprises to proactively address privacy problems, PIA should be connected with AI and data analytics tools. 	<ul style="list-style-type: none"> India's Digital Personal Data Protection Bill aims for a comprehensive framework Challenges are in implementing effective Privacy Impact Assessments Balancing data protection and innovation is crucial 	<ul style="list-style-type: none"> The DPDP Bill should strengthen safeguards for government data handling. The bill currently grants broad exemptions to government agencies from the bill's data protection requirements.
	EU/EFTA	<ul style="list-style-type: none"> The General Data Protection Regulation (GDPR) of the European Union has established a rigorous benchmark for data protection measures, and the forthcoming Data Governance Act is anticipated to further enhance the legal framework. PIA is essential to an organization's ability to meet these strict criteria. 		<ul style="list-style-type: none"> Privacy Impact Assessments (PIAs) are crucial in Europe for data privacy, mandated by the GDPR. However, they can be challenging due to multiple assessments and potential delays. 	<ul style="list-style-type: none"> Educate employees and consumers on GDPR requirements and privacy risks

GAPS-CHALLENGES, FUTURE POTENTIAL & RECOMMENDATIONS



		FUTURE POTENTIAL	RECOMMENDATIONS	GAPS & CHALLENGES	RECOMMENDATIONS
Consent Management Frameworks	INDIA	<ul style="list-style-type: none"> India's data-driven economy and data protection laws Opportunities for Consent Management Frameworks Secure user consent for data collection, storage, and management Consulting services for compliant processes and data sharing solutions Focus on critical sectors like healthcare and education Raising awareness about Consent Management Frameworks Advocating data rights and preferences among users and stakeholders 	<ul style="list-style-type: none"> India could gain cybersecurity expertise by partnering with EU/EFTA universities connect Development of advanced cybersecurity courses in India EU/EFTA is a global player in the cybersecurity market with high demand for Cyber Threat Management (CMFs). Encourage EU/EFTA's SME/MSME to enter India, especially in consent management framework to work with India's SME/MSME. 	<ul style="list-style-type: none"> India's Digital Personal Data Protection Bill introduces consent managers Challenge: Ensuring easy withdrawal of consent for transparency and user-friendliness. 	<ul style="list-style-type: none"> The DPDP Bill may establish a strong enforcement mechanism like EU's GDPR to ensure that the law is effectively enforced.
	EU/EFTA	<ul style="list-style-type: none"> European Commission's "Trusted Identity" initiative promotes Common Mobile Financial Services (CMFs). Aims to enhance the digital experience for European citizens and businesses. Emphasizes secure and seamless technology use. Implementation of consent management as the part of GDPR law. 		<ul style="list-style-type: none"> Challenges in consent management frameworks for organizations of various sizes; Potential lack of user-friendliness, raising concerns about uninformed consent and misuse. Complexity and clarity issues in the ISO 27560 standard. Lack of harmonization with other cybersecurity standards like NIST CSF and PCI DSS. Difficulty for international organizations to comply with multiple standards. 	<ul style="list-style-type: none"> Developing a harmonization process for ISO 27560 and educating organizations about its limitations and cybersecurity importance.
Identity Protection Protocol	INDIA	<ul style="list-style-type: none"> Unverified users pose a security threat Biometric factors (voice, iris, gait, heartbeat) to enhance KYC in 5 years to improve security and user experience 	<ul style="list-style-type: none"> Machine learning and artificial intelligence (AI) will play a pivotal role in the future of document verification. India & EU/EFTA shall work together on creating strong, secure and most advanced digital identity using AI/MI 	<ul style="list-style-type: none"> Digital ID systems like India Stack raise privacy and security concerns. Implementation of DPDP bill is pending 	<ul style="list-style-type: none"> India may learn from EU/EFTA's eIDAS by developing its own trusted lists of organizations that could issue electronic identities making it easier for Indians to use their electronic identities to access online services.
	EU/EFTA	<ul style="list-style-type: none"> European Digital Identity (eID) system for EU/EFTA citizens Single digital identity for public and private services Reduces identity theft risk 		<ul style="list-style-type: none"> Identity Protection Protocol faces digital era challenges due to tech complexities. Challenges include connected objects and facial recognition video surveillance. Highlights the need for ongoing evaluation and improvement of identity protection protocols. 	<ul style="list-style-type: none"> EU/EFTA may promote using biometric information(India's Aadhar) to verify identity to prevent frauds.

GAPS-CHALLENGES, FUTURE POTENTIAL & RECOMMENDATIONS



		FUTURE POTENTIAL	RECOMMENDATIONS	GAPS & CHALLENGES	RECOMMENDATIONS
Cross-border Data Transfer Standards	INDIA	<ul style="list-style-type: none"> • Enacted Digital Personal Data Protection Bill 2023: Focuses on company data handling cross border data transfer. • The bill covers both domestic and cross-border data transfers. • If personal data is transferred outside India without the consent of the data principal the data fiduciary may be subject to a penalty of up to 4% of its global turnover. • If personal data is transferred within India without the consent of the data principal the data fiduciary may be subject to a penalty of up to 2% of its global turnover. 	<ul style="list-style-type: none"> • India and EU/EFTA could establish cross-border data transfer agreements in digital trade • Interoperable Standards, compliance, secure transfers, transparency, user data accountability are important & possible area of collaboration. • Benefits include coordinated enforcement actions, violation information sharing, joint investigations 	<ul style="list-style-type: none"> • The DPDP Bill does not offer sufficient protections for data transfers to third-party nations or to any other acknowledged data protection framework. Lack of clarity hinders cross-border data compliance for organizations. 	<ul style="list-style-type: none"> • India could consider EU/EFTA's GDPR rule adopting a data protection impact assessments (DPIAs) for high-risk data processing activities, including cross-border data transfers..
	EU/EFTA	<ul style="list-style-type: none"> • The General Data Protection Regulation (GDPR) is a regulation in EU/EFTA law on data protection and privacy in the European Union (EU/EFTA) and the European Economic Area (EEA) • Interoperable Cross-border data transfer standards & law boost trade and investment • Trust in data protection encourages investment and trade with EU/EFTA businesses • Fosters economic growth and job creation 		<ul style="list-style-type: none"> • EU/EFTA has various national laws and GDPR. • GDPR may lack transparency and accountability, making it difficult for individuals and businesses to seek redress for potential violations. • Hinders understanding and compliance, potentially impacting innovation, especially for startups relying on cross-border data transfer. 	<ul style="list-style-type: none"> • Just like DPDP, GDPR may also provide clear and more objective set of criteria. • Also, they could collaborate on strong safeguards, such as data encryption and access controls

SUMMARY OF RECOMMENDATIONS

The EU/EFTA-India partnership has flourished through initiatives like the India-EU/EFTA Joint Working Group on Urbanization, Project SESEI, and the Trade and Technology Council (TTC). Key highlights include the establishment of working groups covering Digitalization, Green & Clean Energy, and Market access. The strategic partnership focuses on Security, Climate Change, Clean Energy, ICT, Transport, and more, with a commitment to global standards.

The Connectivity Partnership aligns with the EU's Global Gateway, emphasizing sustainable digital, transport, and energy networks. Specific collaborations include:

- **High Performance Computing and Quantum Technologies**
- **Clean Energy and Climate Partnership**
- **Urban Partnership, and Resource Efficiency initiatives.**

The EU/EFTA-India Agreement on Science and Technology supports innovation in areas like Clean Energy and ICT. The Standards Development effort through Project SESEI involves cooperation with Indian standards organizations, contributing to global harmonization in technology.

India and the EU/EFTA collaboration provides a unique opportunity for shared learning and advancements, with recommendations including joint efforts in:

- **Waste management**
- **Smart metering**
- **Water management**
- **Public safety surveillance**
- **Data analytics, and**
- **Technology integration for sustainable urban development.**

Both parties aim to synergize their technological capacities for cutting-edge solutions, contributing to global best practices in cybersecurity and data privacy.

In waste management, India's AWMINS and EU/EFTA's SCALS and SLUDGE 4.0 offer innovative solutions. Smart metering advancements through India's Smart Meter National Programme and EU/EFTA's AMI can progress through joint deployment efforts. Efficient water management, public safety, and surveillance efforts align, while both regions utilize data analytics for urban planning.

Collaboration emphasizes integrating IoT, AI, and data analytics for sustainable urban development, with policy alignment for climate-neutral urbanization. In the realm of cybersecurity, India and the EU/EFTA can collaborate on data encryption standards, consent management frameworks, data breach response plans, cross-border data transfer standards, data retention policies, and privacy impact assessments. The APEC Cybersecurity Working Group and the Cybersecurity Capacity Building Initiative contribute to Indo-Pacific cybersecurity, providing a basis for collaboration on recruitment and training strategies.

The EU/EFTA's Data Governance Regulation offers a robust framework, and collaborative efforts are evident in the EU/EFTA-India Cyber Dialogue, Joint Working Group, Joint Declaration, ICT Standardization Collaboration, and the Trade and Technology Council. These efforts pave the way for joint certification programs, skill exchange workshops, and research partnerships, enhancing India-EU/EFTA cooperation in cybersecurity.

SUMMARY OF RECOMMENDATIONS

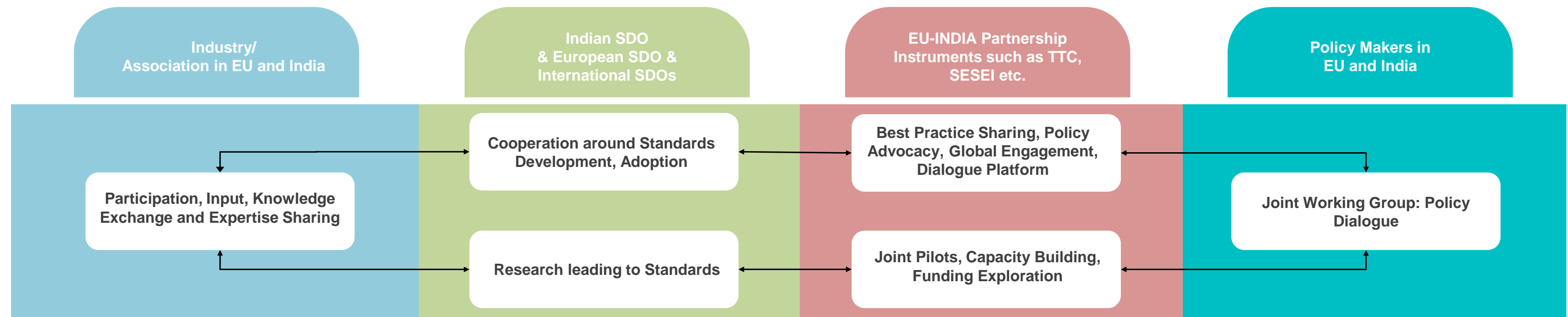
CIRCULAR ECONOMY

- To strengthen the Circular Economic principles (CE) in both India and the EU/EFTA, collaborative efforts should be prioritized while using existing partnership instruments between EU/EFTA and India such as TTC, Project SESEI etc. These partnership instruments shall facilitate the establishment of a knowledge-sharing platform between Indian organizations, fostering a continuous exchange of insights, best practices, research findings, Policy Dialogue and Standards cooperation and formulations.
- Engagement through joint initiatives can include collaborative research projects, workshops, and forums focused on addressing common challenges in plastic and electronic waste management. This platform can serve as a hub for promoting innovation, policy advocacy, and the development of sustainable business models aligned with circular principles.
- Identify unique circumstances of India and EU/EFTA and devise an approach suitable to the respective regions. For example, India needs better infrastructure and more formalization of the waste management processes based on Standards and Guidelines, while EU/EFTA needs more of consumer awareness and behaviour change. A unique blend of information based, market based, and regulatory measures will work for respective regions.
- Constant engagement and collaborations to learn from initiatives from each other's region and test out pilots to test success of initiatives and schemes. For example: Financial incentives and tax reductions are prevalent in EU/EFTA which can be tried out in India. Additionally, policy harmonization is crucial for effective collaboration. India and the EU/EFTA should work towards aligning their regulatory frameworks, drawing inspiration from successful policies in each region. This includes standardizing definitions, regulations, and enforcement mechanisms related to recycled plastics, single-use plastics, and eco-friendly alternatives. Regular dialogues between regulatory bodies, facilitated by Standards development organizations and regulatory authorities, can lead to the development of common standards and guidelines. Furthermore, creating joint certification programs and recognizing each other's certifications can foster trust and streamline the integration of circular practices in cross-border trade. These collaborative measures can contribute to the successful implementation of circular economy principles, promoting sustainability and resilience in both regions.

SMART CITIES: DIGITAL SECTOR

To enhance its position in Asian connectivity, including in India, the EU/EFTA could explore prioritizing Standards based technology, research, capacity building, and skill development in India. This approach will foster innovative, cost-effective, interoperable and scalable connectivity solutions for mutual benefit based on global standards established in close cooperation through existing partnership instruments such as project SESEI, Global Connectivity platforms, TTC, etc. The following summary covers important catalysts for India-EU/EFTA Collaboration.

SUMMARY OF RECOMMENDATIONS



CIRCULAR ECONOMY

- **Policy Alignment:** Harmonize regulations across EU/EFTA and India to better integrate sectors, facilitate smooth trade of circular products and monitor data. The India-EU/EFTA Resource Efficiency and Circular Economy partnership can be useful for such initiatives.
- **Harmonizing Standards:** Ensure seamless interoperability of systems across borders by harmonizing standards between India and the EU/EFTA.
- **Knowledge Exchange:** Sharing best practices b/w India & EU/EFTA and implement pilotable solutions in their respective regions.
- **Joint R&D:** Encourage collaborative research and development initiatives to address common challenges and explore innovative solutions. E.g.: Technology transfer, Financing.
- **Capacity Building:** Offering training programs and research initiatives for their own manpower as well as through student/professional exchange programmes.

CONNECTIVITY IN SMART CITIES

- **Facilitate knowledge exchange & best practices** between Indian and EU/EFTA stakeholders on smart city solutions, such as CITIIS, Varanasi Smart City Project, and EU/EFTA Eco-Cities PPPs
- **Support innovation and capacity building** in digital skills and competencies, such as through EU/EFTA-India Innovation Partnership, Horizon Europe, and EU/EFTA-India Digital Investment Forum.
- **Collaboration on Emerging Topics**
- **Research & Standardization:** Joint research and Standardization on 6G, AI/ML, Quantum etc.
- **Data Governance:** Developing robust data governance frameworks for smart cities, ensuring data privacy, security, and ethical use.
- **Digital Twin Tech:** Exploring collaboration opportunities in the application of digital twin technology in smart cities.
- **Encouraging PPPs:** Foster public-private partnerships to leverage the strengths of both sectors in implementing smart city solutions.

DATA PRIVACY

- **Harmonizing Standards:** Ensure seamless interoperability of systems across borders by harmonizing standards between India and the EU/EFTA.
- **Joint R&D:** Encourage collaborative research and development initiatives to address common challenges and explore innovative solutions.
- **Data Localization Progress:** India's evolving approach focuses on cross-border data transfers.
- **Data Transfer Assessments:** Key assessments are adequacy and comparable protection.
- **Data Privacy Emphasis:** India's growing data privacy focus stems from public awareness and protective measures.
- **Consent Management Framework:** India to harmonize DPDP Bill with GDPR for cross-border data transfers; EU/EFTA to promote open science initiatives, data anonymization & pseudonymization.

CYBER SECURITY

- **Policy Harmonization:** India and EU/EFTA, can work towards harmonizing cybersecurity policies for a unified approach against cyber threats.
- **Cybersecurity Standards:** India and the EU/EFTA, can promote the adoption of international cybersecurity standards among businesses. shall work together to have Global Cyber Security Standards developed at Global Platform such as JTC1, 3GPP, ITU and oneM2M for their adoption and implementation.
- **Information Sharing:** India, the EU/EFTA, can establish a platform for sharing threat intelligence, enabling early detection and mitigation of cyber threats.
- **ENISA Partnership:** NCL's MoU with ENISA facilitates collaborative efforts in cybersecurity standardization, threat exchange, joint training, and international standard adoption.
- **Aligning Cybersecurity Initiatives:** India's potential accession to Budapest convention holds the promise of aligning its cybersecurity initiatives with global norms, further fortifying international collaboration in addressing cyber threats & cybercrime.

SUMMARY OF RECOMMENDATIONS

SMART WASTE MANAGEMENT

In the realm of smart waste management, collaboration between India and the European Union (EU/EFTA) holds promising opportunities. India's Swachh Bharat Abhiyan aligns with the EU/EFTA's Horizon 2020 Project - CityLoops, providing a foundation for joint efforts in sustainable waste management and behavioral change. Despite challenges like high costs and low awareness, collaborative strategies can address these issues together.

Collaboration- Align India's Swachh Bharat Abhiyan with the EU/EFTA's Horizon 2020 Project - CityLoops for shared insights and best practices in sustainable waste management.

Knowledge Sharing- Utilize EU/EFTA's regulatory interpretations for plastic waste management to address challenges like high costs and low awareness,



SMART WATER MANAGEMENT

Smart water management is a critical area where India and the EU/EFTA share common challenges. By collaborating on initiatives like India's National Digital Communications Policy and BharatNet project, and adopting EU/EFTA's ICT standards, the two regions can enhance water management practices and promote sustainability.

Collaboration- Align India's National Digital Communications Policy and BharatNet project with EU/EFTA's ICT standards for water management.

Knowledge Sharing- Explore EU/EFTA's successful PPP models for efficient water management, aligning with India's emphasis on digitalization and sustainability.

SMART METER LIGHTING

Collaborative opportunities extend to smart meter lighting projects, involving organizations like EESL and Endesa. Knowledge exchange on consumer acceptance, integration, and financing models can benefit both regions. Addressing challenges faced by power companies in smart metering, such as Adani Energy Solutions, Tata Power, and Torrent Power, strengthens the collaborative landscape.

Collaboration- Leverage EU/EFTA's experience with SCALS and IoT-based street lighting systems in India's Smart Meter Rollout and Smart Grid Pilot Projects.

Knowledge Sharing- Benefit from EU/EFTA's 50%+ smart meter penetration, understanding consumer acceptance and financing models.



SUMMARY OF RECOMMENDATIONS

PUBLIC SAFETY SURVEILLANCE

In the domain of public safety surveillance, India and the EU/EFTA actively collaborate on initiatives like Safe City Projects and S4AllCities. This collaboration focuses on sharing crucial insights regarding public safety, surveillance, and smart city projects, addressing data privacy, security, and management concerns in biometric surveillance.

Collaboration: Joint efforts on India's Safe City Projects and S4AllCities, facilitating the exchange of insights on public safety and surveillance.

Knowledge Sharing: Utilize EU/EFTA's expertise in security management, cybersecurity, and risk estimation to enhance comprehensive public safety measures.



DATA ANALYTICS AND URBAN PLANNING

Collaboration extends to data analytics and urban planning, with India and the EU/EFTA teaming up on Big Data Analytics in Smart Cities. This collaboration involves the exchange of insights and experiences in data analytics for smart city services, addressing data challenges, and promoting data-driven governance for the development of smarter cities.

Collaboration: Joint efforts on India's Open Data Portal, incorporating EU/EFTA's methodologies for international data sharing and assessment.

Knowledge Sharing: Share India's progress in data readiness and advocate for Open Government Data principles to enhance data sharing practices.

SMART CITIES: ENERGY SECTOR

Cross-Border Collaboration in Energy Standards:

Facilitate cross-border collaboration and exchange to ensure interoperability of standards in the energy storage and management sectors. This will enhance trust, promote smooth energy trade, and facilitate data sharing, ensuring that individual efforts contribute optimally to the global goal of sustainable energy.

Promoting Energy Resilience

Invest in smart and decentralized grids while encouraging citizen and consumer participation. Promote awareness campaigns to facilitate a shift from consumers to producers at localized/micro levels, ensuring a substantial increase in green energy production and overall resilience.

IoT for Adaptive Energy Management

Harness the capabilities of the Internet of Things (IoT) for real-time monitoring and control of energy consumption and production in buildings. Implement adaptive energy management systems to optimize efficiency and sustainability.

Balanced Regulatory Measures and Incentives

Strike a balance between regulatory measures and incentives to drive green initiatives. Implement measures such as green financing in public procurement, mandatory green procurement for major corporations, tax incentives, green certifications, and rewards. This mix of approaches aims to encourage sustainable practices across sectors.

SUMMARY OF RECOMMENDATIONS

SMART CITIES: TRANSPORT SECTOR

- Integration of existing public transport infrastructure is must before new infrastructure development for the first and last mile connectivity.
- Close collaboration with private sector for new infrastructure to raise investment, public awareness creation, increase competition, cut costs and speed up implementation.
- Leveraging the power of IoT and AI for real-time monitoring, intelligent traffic management, congestion control along with robust data protection and ethical and transparent surveillance protocols.
- Cross border collaboration and exchange for interoperability of standards in the transport sector. This increases trust and smooth operation of trade and data sharing so that efforts by individual countries or regions can bring the maximum benefit to the global goals of sustainable energy. Learning through pilot implementation of exemplary models and expansion.

DATA PRIVACY & CYBERSECURITY

- **Collaborative Legislative Frameworks:** Legislative frameworks such as India's Digital Personal Data Protection (DPDP) bill, GDPR in EU/EFTA, and the Budapest Convention on Cybercrime are crucial in addressing digital privacy, cybersecurity, and cybercrime issues.
- **Consent Management Collaboration:** Collaborate on consent management frameworks, focusing on legal and regulatory aspects related to privacy rights and data sharing. Envisioned joint initiatives involve expert participation, technical standards development, and research and innovation to create effective frameworks.
- **Technology-Driven Cybersecurity:** Emphasize the use of cutting-edge technologies like blockchain and artificial intelligence (AI) to enhance cybersecurity. Encourage active participation in awareness events, workshops, seminars, and training programs to facilitate knowledge sharing and contribute to global standards.
- **Identity Protection Protocols:** Learn from each other's experiences in identity protection, drawing insights from Europe's eIDAS Regulation and India's Aadhaar program. Collaboratively develop common identity protection standards aligning with legal compliance requirements.
- **Cross-Border Data Transfer Standards:** Work towards mutual recognition of data protection standards, facilitating secure cross-border data transfers. This collaboration creates opportunities for Indian companies to align with EU/EFTA counterparts, potentially establishing offices or research and development centers in both regions.
- **Data Encryption Standards Collaboration:** Focus on data encryption standards, drawing insights from GDPR and India's DPDP. Collaborate on establishing joint frameworks for data encryption and certification, elevating standards for organizations attaining certification.
- **Secure Authentication Frameworks:** Prioritize joint efforts to strengthen cybersecurity, emphasizing the sharing of best practices and promoting user education on essential aspects like strong passwords and phishing awareness. A cooperative approach aims to create a more secure digital environment for both regions.
- **Privacy Impact Assessments (PIAs) Collaboration:** Explore potential collaboration in privacy impact assessments (PIAs), involving a comprehensive process encompassing risk identification, assessment, mitigation strategies, and thorough documentation. This initiative aims to enhance the understanding and management of privacy implications in various contexts.

THANK YOU!

7TH DECEMBER 2023

