

## SCOPING STUDY

# Sustainable Public Procurement in Indian Railways

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## **Background of the SWITCH-Asia SCP Facility**

The European Union launched the SWITCH-Asia programme with a mission to support the transition of Asian countries to low-carbon, resource-efficient and circular economies while promoting sustainable consumption and production patterns within Asia and greener supply chains between Asia and Europe. The programme aims at providing a platform to promote sustainable consumption and production (SCP) policies and practices in Asia and enhance the awareness and dialogue of local stakeholders. The SWITCH-Asia SCP Facility aims at strengthening the implementation of SCP policies at the national level.

## **Objectives of the assignment in India**

In continuation of the efforts in India, the Ministry of Railways, Government of India, requested technical assistance for translating policies into a plan of action for mainstreaming Sustainable Public Procurement (SPP), sustainable building and construction, water and waste management, in the Indian Railways system. In response to this request, a team of Senior Experts, Dr. Prasad Modak and Mr. Walter Kahlenborn, was set up in April 2020 to carry out a number of activities, including a scoping report, training of staff at Indian Railways and an Action Plan with an implementation guide focusing on SPP.

## **Aim of this publication**

**This Scoping Study lays the basis for all advisory and capacity building activities by the Senior Experts. It portrays the status on Sustainable Public Procurement (SPP) in India, gives an overview of the current SPP system and policies and outlines an Action Plan for further integrating SPP into the Indian Railways system.**

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## LIST OF ABBREVIATIONS

<b>ACASH</b>	Association of Corporations & Apex Societies of Handlooms
<b>BEE</b>	Bureau of Energy Efficiency
<b>BHEL</b>	Bharat Heavy Electricals Limited
<b>BIS</b>	Bureau of Indian Standards
<b>BSCI</b>	Business Social Compliance Initiative
<b>CE</b>	Circular Economy
<b>CFL</b>	Compact fluorescent lamp
<b>CII</b>	Confederation of Indian Industry
<b>CNG</b>	Compressed natural gas
<b>CO<sub>2</sub></b>	Carbon Dioxide
<b>COFMOW</b>	Central Organisation for Modernisation of Workshops
<b>COS</b>	Controller of Stores
<b>CPCB</b>	Central Pollution Control Board
<b>CR</b>	Central Railways
<b>CRB</b>	Chairman, Railway Board
<b>CSR</b>	Corporate Social Responsibility
<b>CVC</b>	Central Vigilance Commission
<b>DB</b>	Deutsche Bahn AG
<b>DEMU</b>	Diesel multiple unit
<b>DFPR</b>	Delegation of Financial Powers Rules
<b>DGS&amp;D</b>	Directorate General of Supplies & Disposals
<b>DPC</b>	Driving Power Car
<b>DRDO</b>	Defence Research and Development Organisation
<b>ELTS</b>	End-of-Life Tyres
<b>EMAS</b>	Eco-Management and Audit Scheme
<b>EMU</b>	Electric Multiple Unit
<b>EU</b>	European union
<b>FICCI</b>	Federation of Indian Chambers of Commerce & Industry
<b>GDP</b>	Gross Domestic Product
<b>GFR</b>	General Financial Rules
<b>GHG</b>	Green House Gas
<b>GPP</b>	Green Public Procurement
<b>GRI</b>	Global Reporting Initiative
<b>IC/ICE</b>	InterCity train/ InterCity Express train
<b>IGBC</b>	Indian Green building Council
<b>IIT</b>	Indian Institute of Technology
<b>INDC</b>	Intended Nationally Determined Contributions
<b>INR</b>	Indian Rupees
<b>IRCTC</b>	Indian Railway Catering and Tourism Corporation
<b>IREPS</b>	Indian Railways E-Procurement System
<b>IRILMM</b>	Indian Railway Institute of Logistic and Material Management
<b>IROAF</b>	Indian Railways Organization For Alternate Fuels

<b>IRS</b>	Indian Railway Service of Engineers
<b>IRSS</b>	Indian Railway Stores Service
<b>ISO</b>	International Organization for Standardization
<b>KVIC</b>	Khadi and Village Industries Commission
<b>KW</b>	Kilo Watt
<b>LCA</b>	Life Cycle Assessment
<b>LCC</b>	Life Cycle Costing
<b>MSME</b>	Ministry of Micro, Small and Medium Enterprises
<b>NAIR</b>	National Academy of Indian Railways
<b>NEERI</b>	National Environmental Engineering Research Institute
<b>NREP</b>	National Rural Employment Programme
<b>NTPC</b>	National Thermal Power Corporation Limited,
<b>ÖBB</b>	Austrian Federal Railways
<b>PAC</b>	Passenger Amenities Committee
<b>PAGE</b>	Partnership for Action on Green Economy
<b>PCMM</b>	Principal Chief Materials Manager
<b>PSU</b>	Public sector undertakings
<b>R&amp;D</b>	Research and Development
<b>RDSO</b>	Research Design and Standards Organisation
<b>RFID</b>	Radio-frequency identification
<b>SBB</b>	Swiss Federal Railways
<b>SNCF</b>	Société nationale des chemins de fer Français
<b>SPP</b>	Sustainable Public Procurement
<b>TGV</b>	Train à grande vitesse (French high speed train)
<b>UN</b>	United Nations

# 1 STATUS ON SUSTAINABLE PUBLIC PROCUREMENT (SPP) IN INDIA

## Regulatory Framework of SPP in India

Public procurement accounts for a significant share of the GDP in countries all over the world. This share is estimated in the range of 15% to 40%<sup>1</sup>, depending on the economic progress made by the country. In India, public procurement as a percentage of GDP is estimated between 20% to 22%<sup>2</sup>, indicating a more significant engagement by the government in providing goods, services, and works.

There is no central legislation exclusively governing public procurement in India. However, various procurement rules and policies are guided by central legislations such as the Contract Act 1872, Sale of Goods Act 1930, Prevention of Corruption Act 1988, Arbitration and Conciliation Act 1996, etc.<sup>3 4</sup>

States like Tamil Nadu, Karnataka, Andhra Pradesh, Assam and Rajasthan have enacted state-specific legislation. The Tamil Nadu Transparency in Tenders Act, 1998, Karnataka Transparency in Public Procurement Act, 1999, the Rajasthan Transparency in Public Procurement Act, 2012, etc., govern the procedure for procurement in the respective States. However, none of these legislations introduce environmental performance as criteria in public procurement.

## Evolution

Sustainable Public Procurement (SPP) in India began with the introduction of EcoMark in 1991, a certification mark issued by the Bureau of Indian Standards (BIS) to promote products conforming to a set of standards aimed at the least impact on the ecosystem<sup>5</sup>.

In 2006, the National Environmental policy encouraged companies to consider environmental aspects for the purchase of goods by applying ISO 14000 in their procurement process. Later, in 2006 the Prime Minister's council of Climate change constituted an Expert Group to adopt Low carbon strategies for products and services.

By 2008, a few public sector entities and government departments started internalizing energy efficiency criteria in the procurement process aligning with Bureau of Energy Efficiency's (BEE) initiatives of the star rating system.

A multi-stakeholder consultation was conducted in 2008 on Green Procurement & Purchasing (GPP). In 2011, the Ministry of Environment and Forests (MoEF) constituted a core group to

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1 Hazarika, B., & Jena, P. R. (2017) Public Procurement in India: Assessment of Institutional Mechanism, Challenges and Reforms, 7 (204), pp 3. India: National Institute of Public Finance and Policy. Retrieved from [https://www.nipfp.org.in/media/medialibrary/2017/07/WP\\_2017\\_204.pdf](https://www.nipfp.org.in/media/medialibrary/2017/07/WP_2017_204.pdf)

2 Ministry of Finance FM Reviews Capital Expenditure & Payments of Maharatnas and Navratnas CPSEs- Retrieved from <https://pib.gov.in/PressReleasePage.aspx?PRID=1586546>, accessed 4th June 2020

3 CUTS International (2014). Public Procurement: Need for a National Policy in India. Jaipur, India: CUTS International.

4 Tabish, S.Z.S. & Jha, K.N. (2011). Analyses and Evaluation of Irregularities in Public Procurement in India. Construction Management and Economics, 29(3), pp 261-274

5 Operation of Eco-mark Scheme- <https://bis.gov.in/index.php/product-certification/operation-of-eco-mark-scheme/-3>

draft guidelines for GPP. This group consisted of Bureau of Indian Standard, Central Pollution Control Board, Industries associations, Indian Green building council, and other ministries.

A product-based approach focusing on key environmental issues and building on existing policy instruments was adopted. The group recommended legislation and an institutional arrangement to encourage the central government to procure more green products and services.

The MoEF mandated CII to develop green procurement guidelines and build capacity for formulating, implementing and enforcing GPP at the national and state levels.

A year later, the Government of India introduced the Draft Public Procurement Bill-2012, which proposed the environmental characteristics of a product as an evaluation criterion for procurement. This bill was however not passed.

An Expert Group on "Low Carbon Strategies for Inclusive Growth" was set up by the Planning Commission in 2011 to suggest low carbon pathways consistent with inclusive growth. The group made contributions to the Twelfth Five Year Plan and presented an interim report that provided a menu of options for India to reduce its emission intensity by 20-25% over 2005 levels by the year 2020. This Final Report submitted in 2014 provided a detailed and longer-term assessment of these options and the macro-economic and welfare implications of the low carbon strategy that included preference to purchasing of low carbon goods and services.

In 2014 India joined the 10 year framework of Programmes on Sustainable Consumption and Production (10YFP), a global commitment to accelerate the shift towards sustainable consumption and production.

India committed its Intended Nationally Determined Contribution (INDC) to the Paris agreement in 2015 to improve the emissions intensity of its Gross Domestic Product (GDP) by 33-35% by 2030 below 2005 levels. It has also pledged to increase the share of non-fossil fuels-based electricity to 40% by 2030. Indian Railways was a lead signatory to India's NDC by committing to reduce 20% of freshwater consumption by 2030 and to reduce carbon emission by 32% over the base year 2005 by improving rail traction energy & fuel efficiency.

General Financial Rules (GFR) revised and released in 2017 has provisions that purchasing authorities can include environmental criteria while making procurement; this has also been emphasized in the procurement manuals issued by the Ministry of Finance (MoF). While GFR has provisions for environmental criteria, there are challenges in terms of implementation and its remit remains restricted to certain products.

In 2018, a Task Force on Sustainable Public Procurement was created by the Department of Expenditure, to review international best practices in SPP, and recommend an initial set of product/service categories (along with their specifications) where SPP could be implemented. All central Indian government ministries, departments, and central public-sector undertakings will be subject to the recommendations of the task force.

NITI Aayog in 2019 pitched for a transition to Resource Efficiency and Circular Economy as an Economic Paradigm for New India. A Status Paper and Way Forward on Resource Efficiency & Circular Economy and four Sectoral Strategy Papers on Resource Efficiency on Steel, Aluminum, Construction & Demolition Waste, Secondary Materials Management in Electrical & Electronics Sector was released. The Status Paper emphasized the need for SPP



as a cross-cutting policy instrument to promote Resource efficiency and circular economy in India.

Late 2019, the Ministry of Environment, Forest and Climate Change (MoEFCC) drafted India's first National Resource Efficiency Policy (NREP). The NREP aims to make industries resource-efficient and also remediate pollution of air, land, and water. The draft outlines the procurement of products with lower environmental footprints such as secondary raw materials and locally sourced materials.

Figure 1 summarizes the above initiatives in the form of a timeline.

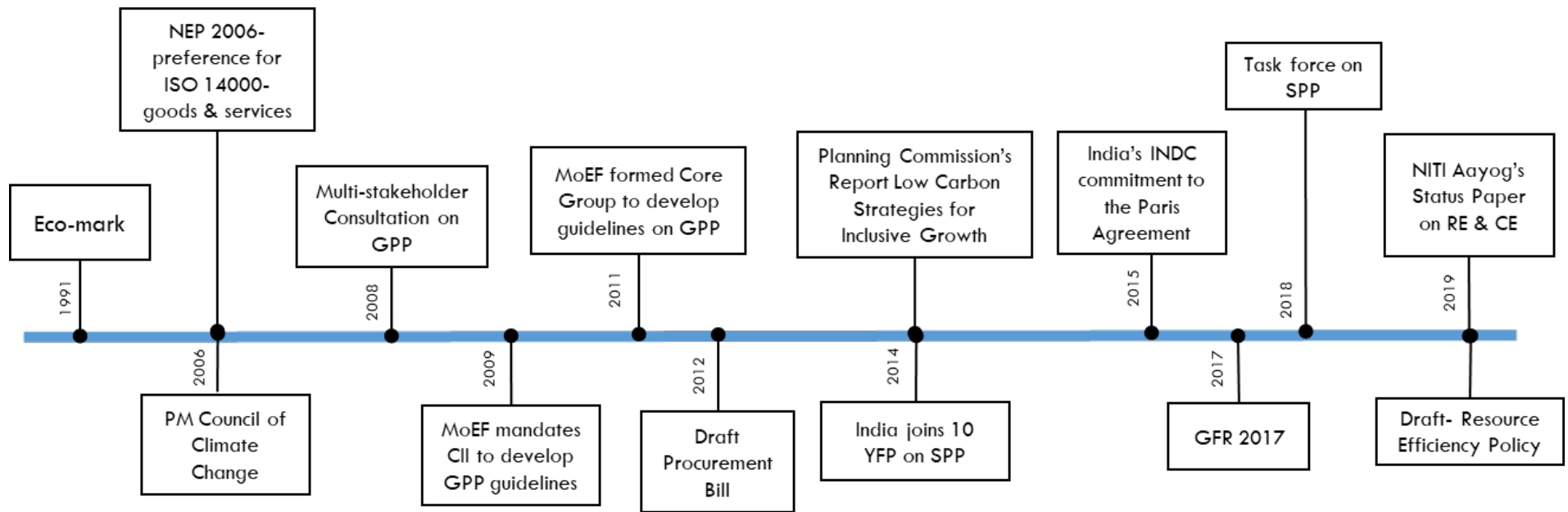


Figure 1: Timeline of SPP initiatives in India

## Administrative Guidelines

In the absence of a comprehensive law, General Financial Rules (GFR) issued by the Ministry of Finance are followed by various government departments and public entities at the central and local level as a set of guiding regulatory principles for public procurement.

GFR were issued for the first time in 1947, bringing together in one place all existing orders and instructions pertaining to financial matters. These have subsequently been modified and issued as GFR 1963 and GFR 2005.

The latest GFR were issued in 2017. As per the currently applicable GFR, the fundamental principles of public buying are for enhancing efficiency, economies, transparency and promotion of competition in public procurement (Rule 137). All government purchases must strictly adhere to the principles outlined in the GFR, which include specific rules on procurement of goods and services and contract management.

Following provisions in the GFR facilitate the procurement of sustainable products by public sector<sup>6</sup>

- Rule 173 (xi) Criteria for determining the responsiveness of bids should consider elements such as performance/efficiency/environmental characteristics;
- Rule 136 (iii) While designing the projects, principles of Life Cycle cost may also be considered
- Rule 173(xvii) Ministries or departments while procuring electrical appliances shall ensure they carry the notified threshold or higher Star Rating of BEE

In addition, the Manual for Procurement of Goods, 2017 (MPG) contains guidelines for the purchase of goods and addresses energy, environment and compliance related expectations. The Delegation of Financial Powers Rules, 1978 (DFPR) delegates the government's financial powers to various ministries and subordinate authorities. The guidelines allow specifications for the acquisition of Environmental friendly products through the use of ISO 14020 or voluntary environmental standards (as per clause 2.2 Technical specifications ix).

## Task Force on SPP

The Department of Expenditure (DoE), Ministry of Finance Office, constituted a Task Force on Sustainable Public Procurement (SPP) in 2018 to finalize the procedure for public procurement<sup>7</sup>.

The Sustainable Procurement Task Force members include joint secretaries, directors-general, or other representatives from the following entities: Confederation of Indian Industry (CII), Department of Expenditure, Ministry of Finance, Ministry of Environment, Forest and Climate Change (MoEFCC), Ministry of Railways (MoR), Bureau of Indian Standards, Bureau of Energy Efficiency, Dedicated Freight Corridor Corporation of India, and the Public Procurement Division (MoF 2018).

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<sup>6</sup> General Financial Rules- 2017 Government of India, Ministry of Finance, Department of Expenditure- [https://doe.gov.in/sites/default/files/GFR2017\\_0.pdf](https://doe.gov.in/sites/default/files/GFR2017_0.pdf)

<sup>7</sup> Office Memorandum- Task force on SPP <https://doe.gov.in/sites/default/files/Task%20Force%20on%20Sustainable%20Public%20Procurement.pdf>, accessed 7<sup>th</sup> June 2020

The Task Force recommended seven product categories, including public works (brick, steel, and cement), electrical appliances, information technology (computers & peripherals, photocopiers, telecom), pharmaceuticals (bulk drugs), paper, office furniture, and lighting. These products categories were chosen based on their environmental impact (from production, use, or disposal), volumes in use, and their significant share of public spending.

## 2 OVERVIEW OF THE PRESENT PROCUREMENT SYSTEM IN INDIAN RAILWAYS

Indian Railways (IR) is a state-owned public utility of the Government of India under the Ministry of Railways and headed by the Minister of Railways. The management of the IR is led by the Chairman, Railway Board (CRB). Members of the Railway Board include the Financial Commissioner, Member Traffic, Member Engineering, Member Rolling Stock, Member Traction, Member Staff, Member Material Management, and Member Signal & Telecom, who represent their respective functional domains. (Refer to Figure 2).

For administrative purposes, IR is divided into 17 zones, each headed by a General Manager. The GMs manage rail operations within each zone, and have powers to sanction certain projects up to a certain amount. Zonal Railways are further divided into smaller operating units called Divisions. There are 68 Operating Divisions in IR at present, each under a Divisional Railway Manager.

In addition, several Production Units look at the manufacturing of coaches, locomotives, and wheels. There are Training Establishments and Public Sector Enterprises which manage various ancillary activities such as catering, ticketing, developing land, and managing the dedicated freight corridors.

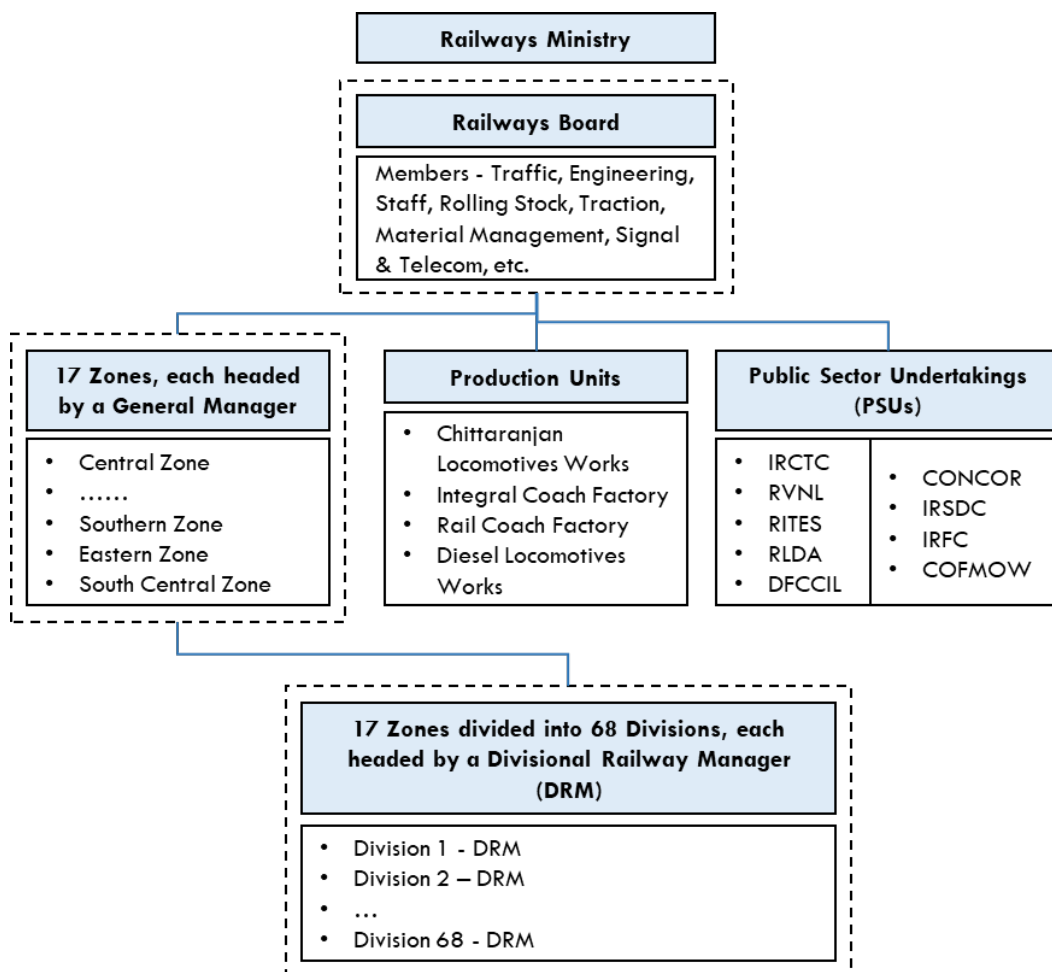


Figure 2: Institutional setup of Indian Railways

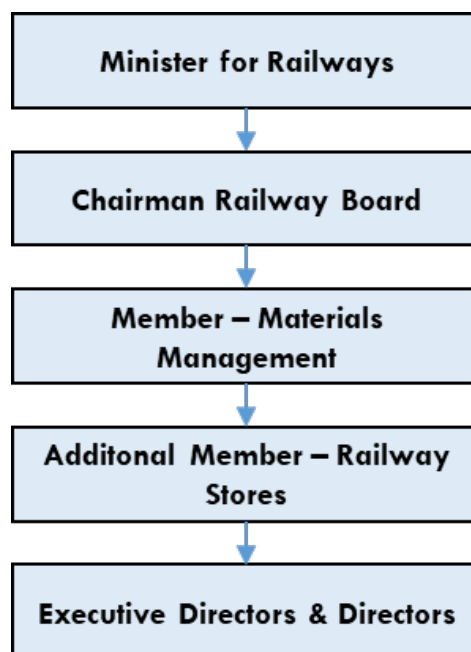
The Union Cabinet approved the organisation restructuring of Indian Railways in December 2019. The Railway Board will be reorganised based on functional lines<sup>8</sup>. The Railway Board will be composed of a

- A Chairman, who will act as the Chief Executive Officer.
- It will have four members responsible for (i) infrastructure, (ii) operations & business development, (iii) rolling stock, and (iv) finance, respectively.

On a Zonal Railway setup, a General Manager is assisted by Additional General managers and heads of different departments such as Chief Engineer, Chief Operating Superintendent, Chief Commercial Superintendent, Chief Mechanical Engineer, Controller of Stores, etc.

## Materials Management

In the Railway board, the Member-Materials Management deals with planning, organizing, communication, directing, and controlling of activities concerned with the flow of materials into IR and its further movement to various users and departments. An Additional Member (Railway Stores) is the head of Railway Stores Directorate. There are Executive Directors, Directors/Joint Directors and Deputy Directors in this Directorate. This is visualized in Figure 3.



*Figure 3: Railway board for Materials Management*

The functions of Railway Stores Directorate are summarized below

- Policy Formulation: Frame and issue of policy guidelines to all Zonal Railways and production units on stores and purchase
- Inventory Control: Policies for efficient inventory management

<sup>8</sup> Cabinet approves restructuring of Railway Board, merging cadres -accessed 4<sup>th</sup> June 2020  
<https://economictimes.indiatimes.com/news/economy/policy/cabinet-approves-restructuring-of-railway-board-merging-cadres/articleshow/72953393.cms?from=mdr>

- Centralized Purchase: High value purchase to ensure equitable distribution as per needs, where the purchase is beyond the approval limit of General Manager
- Liaison with other Ministries: Railways Liaison Officer designated for purchases coordinated through the Directorate General of Supplies and Disposals and other ministries
- Coordination for supply of steel: With steel plants in drawing Rolling programme and monitoring of supply of steel to various units.

### Materials Management in Zonal Level Railways

At the Zonal Railways, the Material Management/Stores Department is at three levels - Headquarters level, Divisional level and Extra Divisional or District level in the form of Stores Depots and Printing Presses.

At the zonal levels, head of the department is the Principal Chief Materials Manager (PCMM). The PCMM is assisted by Chief Materials Managers (C.M.M.s), Dy. Chief Materials Managers, who are further assisted by the Senior Materials Managers (S.M.M.) and Assistant Materials Managers. The Figure 4 represents the materials management organization at the zonal and depot level.

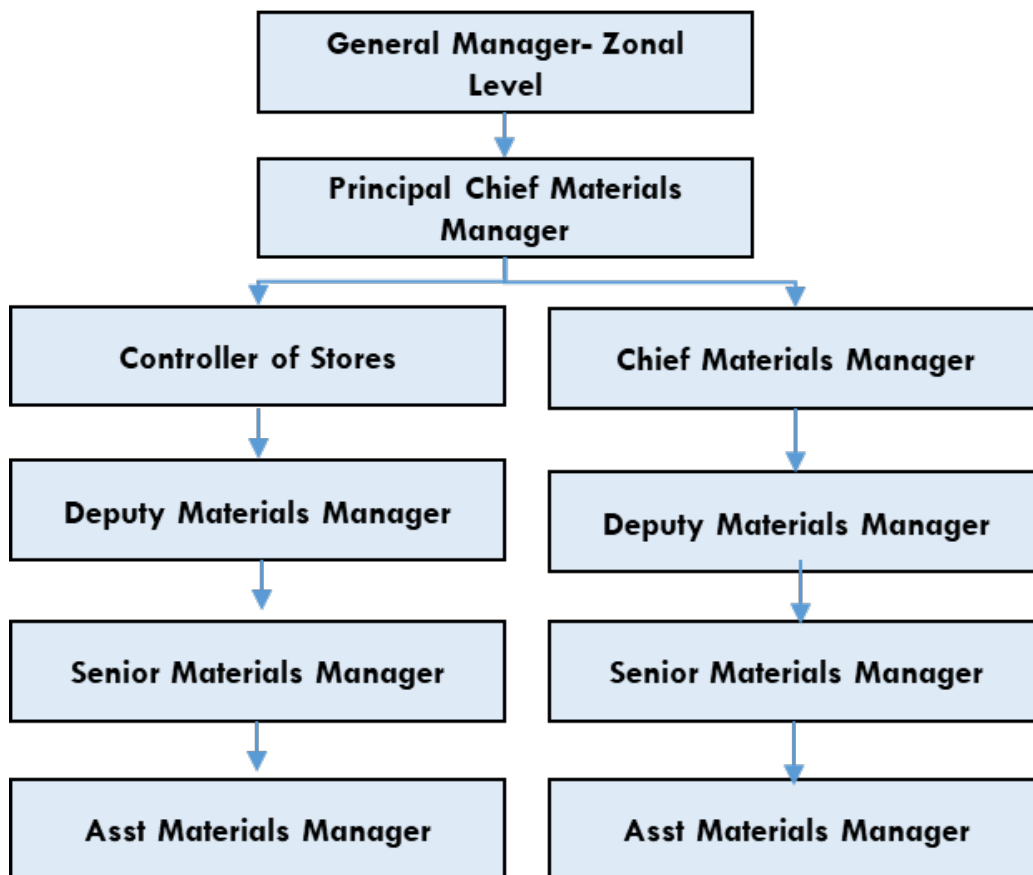


Figure 4: Materials Management Organization at the Zonal and Depot level

The entire activity of procurement, inspection, accounting, stocking, distribution of stores and disposal of surplus stores and scrap materials is looked after by the Stores Department. Items for the stores are procured for the maintenance of rolling stock (locomotives, coaches, EMU

Coaches, and wagons) and infrastructure (track, signaling systems, building, etc.), operation of assets (lubricating oils, etc.) and repairs in workshops. Procurement of stores is done online through IREPS website: [www.ireps.gov.in](http://www.ireps.gov.in)

The Head of Stores Department is the Controller of Stores who functions at the same level as other Heads of departments. The Stores department manages about 262 stock depots<sup>9</sup> that feed into the repair workshops and maintenance sheds. A Depot Officer heads these depots.

The stocking depots form the basic unit of the materials management organization. Stock depots store items that are regularly required for repair, maintenance, operation and manufacturing activities and that need to be replenished at regular intervals

The stocking depots are responsible for inspection, receipt, storage and issue of the stock materials to the consuming departments. The procurement of the stock items is not carried out by the stocking depots. Instead, the stocking depots annually raise indents based on the rate of consumption and inventory position estimated to Controller of Stores, through online Material Management Information System (MMIS).

## Other Agencies

All items for stores are purchased centrally, not through Zonal railways. Other agencies involved are listed below

- Directorate General of Supplies & Disposals (DGS&D): To get advantage of bulk quantity and standard rate contracts for common user goods the items which are used by all Government departments are generally purchased through DGS&D using the online Government e-marketplace. DGS&D is in a position of clubbing the requirements of all Government departments and therefore, purchase the items at much more economical prices.  
The DGS&D also maintains long-term contracts with KVIC and ACASH for the reserved items of recurrent procurement items and lays down terms and conditions therein. With KVIC, IR's procurements have increased from 716 crores in 2005-2006 to 1834 crores in 2011-2012. IR relies on KVIC for its textile requirements
- Indian Railways Stores Service (IRSS) manages the procurement, logistics and transportation of materials
- Railway Board: Items of imports involving large sums of foreign exchanges and some critical items are arranged through Railway Board. These items are not manufactured in adequate quantities in the country.
- Other Production Units: Some items are centrally procured by some Railways or production units such as components of diesel locomotives & ICF coaches are procured through Diesel Locomotive Works -Varanasi and ICF Madras respectively.
- Other Agencies: Sleeper Pool Committee for purchasing sleepers, Government Medical Store, Central Organization for Modernization of Workshops (COFMOW) for machinery and plant items required for workshops modernization.

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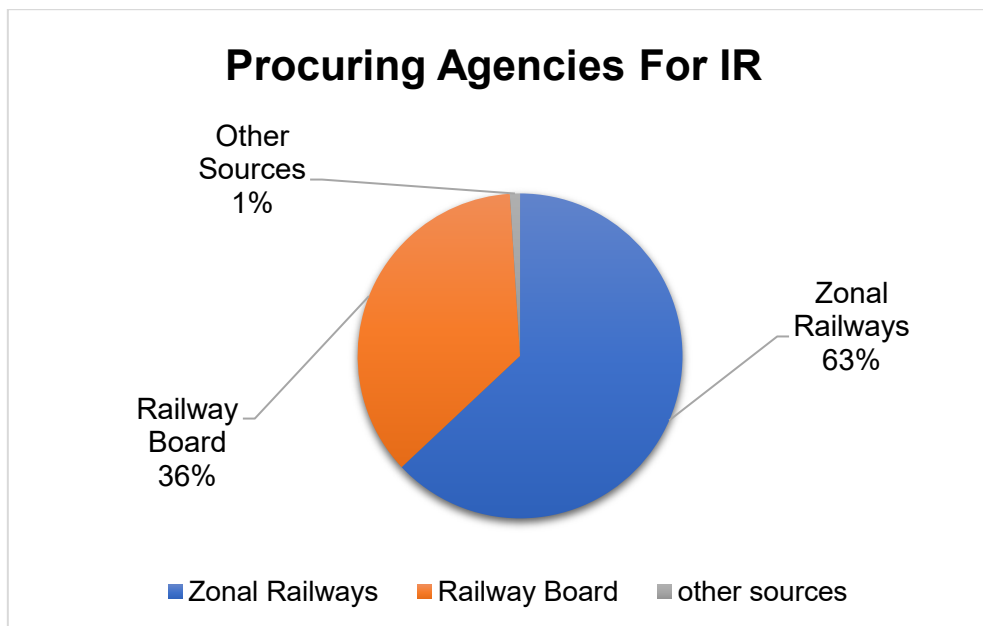
<sup>9</sup> Indian Railways Year Book 2018 – 19- Railway Board, Ministry of Railways, Government of India-  
[https://www.indianrailways.gov.in/railwayboard/uploads/directorate/stat\\_econ/Year\\_Book/Year%20Book%202018-19-English.pdf](https://www.indianrailways.gov.in/railwayboard/uploads/directorate/stat_econ/Year_Book/Year%20Book%202018-19-English.pdf)



- Research Design & Standards Organization (RDSO) engages in developing standards, technical investigations, testing and inspecting the items to be procured, and drafting the tender specifications. Currently, RDSO does not address environmental criteria.

## Agencies involved in Procurement

Zonal Railways and railway production units mostly procure materials required by them in a decentralised system. However purchase of items which are centralised for procurement at Railway Board's level are procured through the Government e-marketplace portal hosted by DGS&D where common user goods and services can be procured.



*Figure 5: Procuring agencies for IR*

Figure 5 denotes that out of INR 62,133.74 crore worth of stores procured in 2018-19, 63% was done by Zonal Railways and Production Units, 36% by Railway Board and the balance 1% through other sources.

Stores worth ~10% were bought from Small Scale Sector and Khadi and Village Industries in 2018-19. Public Sector Undertakings contributed 20% and other industries contributed 80% towards supplies.

## Existing Procurement System

The public procurement in Indian Railways is governed by the Indian Railway Financial Code (1998), Indian Railway Code for the Accounts Department (1997), the Indian Railway Code for the Stores Department (1990), and Indian Railways Rolling Stock Code (2008).

### General Financial Rules

Railway Board vide its letter No. 2017/ F(X)II/PW/R dated 9<sup>th</sup> February 2018 advised all concerned to refer the rules under the General Financial Rules, 2017 and use them as broad principles while making financial decisions. GFR 2017 are the guiding principle for Railways

for the purpose of categorizing various modes of tenders, such as, Works, Goods, and Consultancy.

Manual for Procurement of Goods and Services<sup>10</sup> and Manual for Procurement of Consultancy and Other Services<sup>11</sup> were revised after a decade and issued in 2017 by the Department of Expenditure, Ministry of Finance within a month of the release of GFR 2017, which was followed by issue of Manual for Procurement of Works<sup>12</sup> in 2019.

The Directorate General of Supplies and Disposals Manual on Procurement and the Central Vigilance Commission (CVC) Guidelines prescribe the procurement procedure to be followed by all central ministries.

### **Transparency & Digitization – Digital India**

Digital transformation of Materials Management on Indian Railways started with roll out of e-procurement system in FY:2011-12 with limited scope of e-tendering. This has now extended to encompass the complete Materials Management cycle which includes demand generation, tendering, purchase decision, contracting, inspection, material receipt and payment.

All types of tenders for Goods, Services, Works, Earning/Leasing and sale of scrap are issued on a single web-portal i.e. [www.ireps.gov.in](http://www.ireps.gov.in). An Android app "IREPS" has been launched which enables access to useful information related to Railways procurement and disposal<sup>13</sup>.

### **Indigenous Vendor Development – Make in India**

In 2017, the government issued the Public Procurement (Preference to Make in India) Order 2017, which grants purchase preference to local suppliers based on certain conditions to promote the manufacturing and production of goods and services in India.

Indian Railways has fully implemented Public Procurement (Preference to Make in India) Order. The value of Indigenous stores at INR 61,078.07 crore during 2018-19 constituted almost 98% of the total purchases by Indian Railways.

Indian Railway has to depend on imports for high technology components for its locomotives, coaches, signal and telecom equipment etc. which are not available in adequate quantity with required specifications within the country. Figure 6 provides the share of Indigenous purchase by IR.

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<sup>10</sup> Manual for Procurement of Goods (2017). Department of Expenditure, Ministry of Finance, Government of India. Retrieved from [https://doe.gov.in/sites/default/files/Manual%20for%20Procurement%20of%20Goods%202017\\_0\\_0.pdf](https://doe.gov.in/sites/default/files/Manual%20for%20Procurement%20of%20Goods%202017_0_0.pdf)

<sup>11</sup> Manual for Procurement of Consultancy & Other Services (2017). Department of Expenditure, Ministry of Finance, Government of India. Retrieved from [https://doe.gov.in/sites/default/files/Manual%20for%20Procurement%20of%20Consultancy%20and%20Other%20Services%202017\\_0.pdf](https://doe.gov.in/sites/default/files/Manual%20for%20Procurement%20of%20Consultancy%20and%20Other%20Services%202017_0.pdf)

<sup>12</sup> Manual for Procurement of Works (2019). Department of Expenditure, Ministry of Finance, Government of India. Retrieved from <https://doe.gov.in/sites/default/files/Manual%20for%20Procurement%20of%20works%202019.pdf>

<sup>13</sup> Indian Railways Year Book 2018 – 19- Railway Board, Ministry of Railways, Government of India- [https://www.indianrailways.gov.in/railwayboard/uploads/directorate/stat\\_econ/Year\\_Book/Year%20Book%202018-19-English.pdf](https://www.indianrailways.gov.in/railwayboard/uploads/directorate/stat_econ/Year_Book/Year%20Book%202018-19-English.pdf)

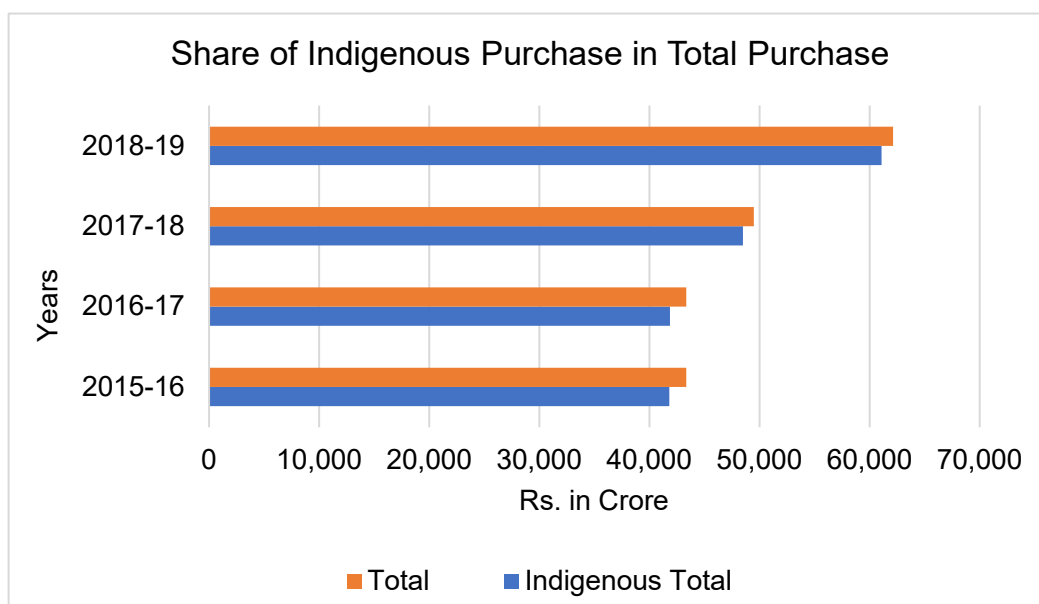


Figure 6: Share of Indigenous Purchase

In 2012, the Ministry of Micro, Small, and Medium Enterprises (MSME) passed an executive order stating that every central government ministry, department, and public sector unit (PSU) must procure a minimum of 20 percent of its goods and services from Micro and Small Enterprises (MSE). Although this order does not mandate GPP, it sets a precedent for preferential purchasing practices that could be similarly formulated to target environmentally preferable products.

### Khadi and Village Industries Commission

The Railway Board in January 2019 instructed the Zonal General Managers that Linen items (Two Bed Sheets, Pillow Cover and Face Towel) were to be procured by KVIC and Association of Corporations and Apex Societies of Handlooms (ACASH). Stores worth INR 6,269.56 crore were bought from Khadi and Village Industries in 2018-19.

Also, instructions to use locally-produced, environment-savvy terracotta products manufactured by the KVIC like *kulhads*, glasses and plates for serving catering items like snacks and tea to the passengers at the Varanasi and Raebareilly railway stations were issued.

### IRCTC

Indian Railway Catering and Tourism Corporation Limited (IRCTC), was incorporated in 1999 as an extended arm of the Indian Railways to upgrade, professionalize and manage the catering and hospitality services at stations, on trains and other locations and to promote domestic and international tourism. This is achieved through the development of budget hotels, special tour packages, information & commercial publicity and global reservation systems.

It may be thus observed that there are several agencies involved in IR's procurement with varying degrees of procurement, with GFR playing an important role.

### 3 THE SOURCING PROFILE

#### Classification of Stores

The items procured by the stores include the following:

- a. Raw material and equipment for Production, Operation, & maintenance of a large fleet of Rolling stock of all types.
- b. Rails, Track machines, and track fittings,
- c. Wheels, Axles. Rails, Track machines and track fittings,
- d. Steel, Cement
- e. Diesel, oil and lubricants, chemicals.
- f. Workshop plants, machines and tools.
- g. Rolling stock spares.
- h. Electrical, Signaling and Telecom equipments and spares.
- i. Staff welfare, healthcare and passenger amenity items.

Figure 7 provides a break-up of the expenditure on the procurement of different goods by Indian Railways. The spending on stores for the manufacture of rolling stock and purchase of complete units is the highest across the last five years.

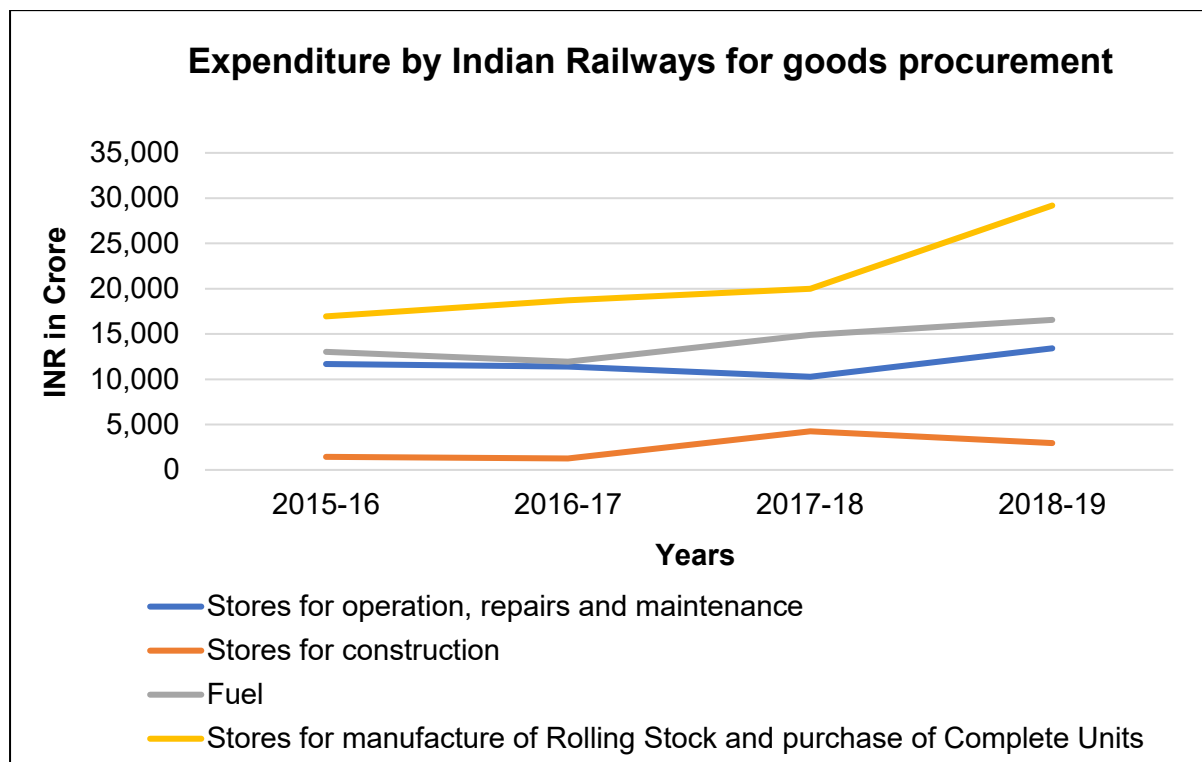


Figure 7: Expenditure by IN for goods procurement

## Procurement Procedure

Indian Railways procurement process various activities via the e-procurement system running [www.ireps.gov](http://www.ireps.gov). The multiple stages of the procurement process are represented in the Figure 8 and described in the subsections below.

### Raising of Indents & estimation of needs

All material procured is categorized as Stock and NonStock items.

- Stock items have a regular demand, consumption and recoument.
- Non-stock items are required occasionally and not regularly.

For stock items an annual procurement system is followed. Stores generate an indent for stock items based on the consumption patterns of the previous years. The Controller of Stores (COS) has full authority to scrutinize every demand, to question the quality of items, and modify the quantities.

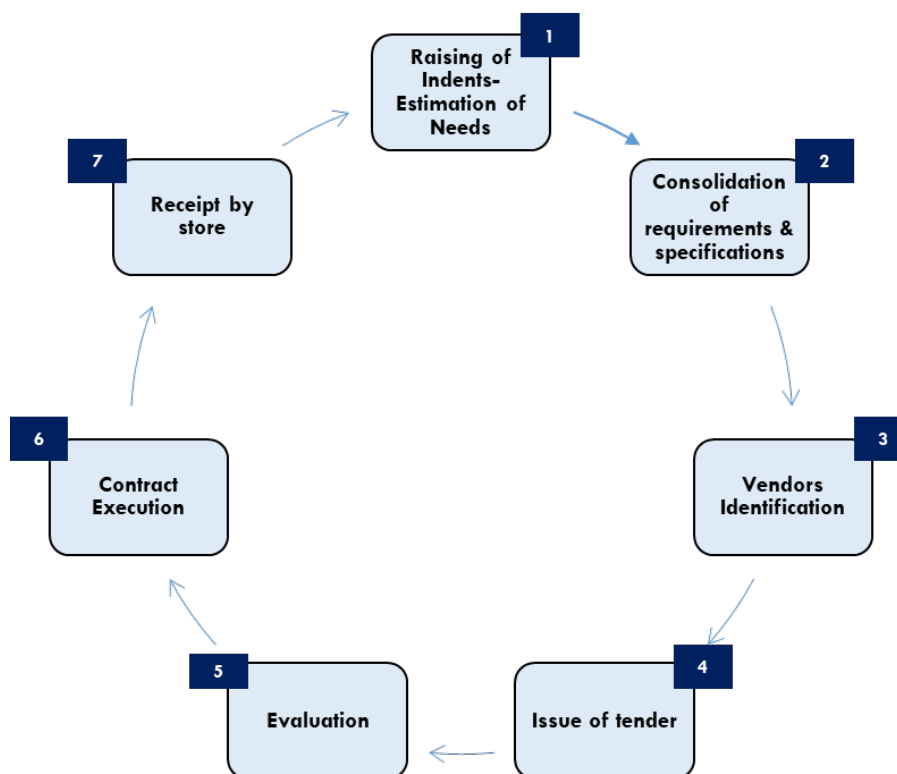


Figure 8: Procurement Procedure for Indian Railways

### Consolidation of requirements & specifications

Items not arranged by the Railway Board and which are not required to be purchased through the Central Purchase Organisations are procured directly through the Controller of Stores (COS). The indents generated across all stores and production units are consolidated in the controller of stores office.

The Railway Board procures indents with items of Rolling Stock, fuel, fish plates, cast iron sleepers, wheels, tyres, axles, imported steel, certain nominated critical items like composite brake blocks, etc.

### Vendor Identification

The significant share of procurement in railways is from approved vendors. Approval is performed by a centralized agency such as Research Design and Standard Organization (RDSO), Diesel Locomotive Works or Chittaranjan Loco Works etc.

While approving only technical and financial capability of the vendor is taken into considerations.

### Issue of Tender

The COS arranges purchase through the issue of the following tenders

- Global tenders involving Foreign Exchange.
- Advertised Tender or Open Tender (Generally for items valuing over INR 10 lakhs).
- Limited Tender/ Bulletin tender to approved / registered vendors for demands of value up to INR 10 lakhs.
- Special limited tenders: if the value is more than 10 lakhs and it is desirable to go for limited Tender due to vital or safety nature of item or urgency subject to finance concurrence and competent authority's sanction.
- Single Tender if there is only one source of supply (PAC - Proprietary Article Certificate) or if the item is of minimal value

### Evaluation

A tender committee consisting of 3 officers - one from Stores Department, one from the department requiring the item, and one from Accounts Department is formed. The Tender Committee is a recommending body; its recommendations may/may not be accepted by the COS.

The following points are considered while finalizing a tender

- The offer should be technically suitable, i.e., the material offered by the firm should be precisely as per the specification given in the tender enquiry.
- Out of all technically suitable offers, the lowest offer is examined for the feasibility of rates.
- If the rate of the lowest technically suitable offer is considered feasible, terms and location of delivery are verified.
- Background verification on the firm and its previous records is conducted.

Vendors selected are required to arrange an inspection of all consignments from 3rd party inspecting agencies like Rail India Technical and Economic Services Ltd or RDSO before dispatch of material.

### **Contract Execution**

A purchase order is issued to the awardee, and a contract is executed. The terms of the contract are as per the "Indian Railways standard (IRS) Conditions of Contract". The supplier will dispatch the material at the said time of delivery to the store, raising the indent directly.

### **Receipt by store**

The consignee stocking depot on receipt of the supplies will carry out inspection of material before acceptance and if everything is as per the prescribed specification will intimate the Controller of Stores (COS) office and accounts personnel designated to make payment. Details of date of supply, quantities received, rejected or accepted quantities will be sent to the COS.

Indian Railways Accounts department maintains oversight on procurement issues through financial scrutiny of all procurement proposals, participation in the tender process and payment

## 4 SPP POLICIES AT IR AND EXISTING GREEN INITIATIVES

A workshop on GPP was conducted at the Indian Railways Institute for Logistics and Materials Management (IRILMM) in 2010 to introduce the concept of GPP. Subsequently, a barrier analysis was conducted between 2010-2012 to understand the challenges that would be faced in implementation of GPP.

IR set up the Environment Directorate in the Railway Board in January 2015 to coordinate all environment management initiatives across the Indian Railways. The Vision and Mission of this directorate is given in Box 1.

### **Vision**

To promote Green environment and clean energy while making the Indian Railways a global leader in sustainable mass transport solutions

### **Mission**

- To promote energy conservation measures.
- To maximize the use of alternate forms of clean energy, thereby minimizing the carbon footprint of Railways.
- To provide clean and hygienic environment to customers.
- To promote conservation of water and other natural resources.
- To march towards Zero waste discharge from the major Railway units.
- To promote Green built-up spaces and expand tree-cover.
- Building in house capacity to set up an effective Environment Management System.

### **Box 1: Indian Railways Environment Directorate - Vision & Mission**

Following the setting up of Vision and Mission, IR has taken steps to streamline its initiatives in Environmental management with interventions in Energy Efficiency, Renewable and Alternate sources of Energy, Water Conservation, Afforestation, Waste Management and Green Certifications.

Indian Railways established a new committee in 2017 to draft sustainable procurement guidelines for Indian Railways in view of the new Manual for Procurement of Goods, 2017, the committee is yet to come up with its draft guidelines.

Currently, there is no SPP policy at IR. However, there are some directions suggested by GFR 2017, which are followed by IR. Despite no direct mandate to procure sustainable products, IR has gone ahead and integrated environmental and social concerns in procurement decisions aligning with their mission. The following sections describe these initiatives.



## Energy

Indian Railways consumes over 20 billion kWh<sup>14</sup> of electricity annually, comprising around 2% of the country's total power consumption. IR has taken a series of measures to cut down its energy consumption and rationalize its energy procurement process by implementing several energy conservation measures, procurement of power under Open Access and harnessing Renewable Energy.

### Phasing out incandescent lamps by CFLs and 100% LED Lighting

Initially, phasing out of the incandescent lamps by Compact Fluorescent Lamps (CFLs) was undertaken in the interest of energy efficiency. Box 2 describes the phase out effort.

Indian Railways undertook a unique initiative in 2008 to reduce peak lighting loads in its residential quarters by replacing incandescent lamps with energy-efficient CFLs. The project team used life-cycle costing to demonstrate the potential benefits of using CFLs over incandescent bulbs. This project saw the replacement of 1.4 Million I.C.L.s with CFLs even though the up-front purchase price of a CFL in India at that time was approximately five or six times greater than that of an incandescent light.

#### *Box 2: Indian Railways CFL initiative*

Currently, all railway installations, including stations, offices, maintenance depots and other buildings have been fitted with 100% LED luminaries. 64% of residential quarters have been provided with LED as a one-time provision.

100% LED installations in Railway Stations will reduce about 10% of total energy being utilized, thus leading to savings of about 240 million kWh units of electricity<sup>15</sup> i.e. savings of Rs 180 Cr. per annum.

## Renewable Energy

IR has installed 82.42 MW Solar and 53 MW Wind power across Railway installations. IR has set a target to meet at least 10% of its energy requirement through renewable energy.

As a part of this initiative IR has planned to set up

- 1000 MW solar plants
- 200 MW of wind power plants

### Solar Panels on trains

- Solar Panels have been installed on 10 Exhibition Coaches of Swachchhata Express. The 4.5 kWp solar panel can produce 10 KWh per day for electric supply to lights and fans inside the coach
- Flexible solar panels retrofitted on 13 coaches of Sitapur-Rewari passenger.

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<sup>14</sup> Indian Railways, sustainable Mass Transportation System, Environmental Sustainability Annual Report 2018-19 [https://www.indianrailways.gov.in/railwayboard/uploads/directorate/Environment\\_Management/Circulars/Enrolment\\_Sustainability\\_2018\\_19\\_R.pdf](https://www.indianrailways.gov.in/railwayboard/uploads/directorate/Environment_Management/Circulars/Enrolment_Sustainability_2018_19_R.pdf)

<sup>15</sup> Ministry of Railways- Press Release on LED Lighting- 19th December 2017 <https://pib.gov.in/PressReleasePage.aspx?PRID=1513207>

However, whether the end of life of the solar panels has been factored needs to be ascertained.

### **Green Powered Stations**

- Asangaon Railway station of Central Railway under Mumbai Division has been declared 100% Green Powered Station in March 2018 as it is powered with windmill and solar panels.
- Guwahati Railway station in the Northeast Frontier Railway became the first Railway station in Northeast to run completely on solar power in May 2018.
- Moreover, 12 more stations have been declared Green Railway stations across IR, which are meeting their energy needs completely either through Solar or by Wind.
- Electricity supply between 10am to 5.30pm to three major railway stations in the western region, Erode, Coimbatore and Salem, is provided by solar power.
- The Nandyal-Yerraguntla section in Guntakal Division has been declared as the first solar section in the South-Central Railway. All stations in this particular section of South-Central Railway have been provided with solar panels to tap solar energy.

### **Alternative Fuels**

Indian Railways has started using High Speed Diesel oil blended with 5% bio-diesel (B5) mixture at two locations Itarsi/WCR and Sanathnagar/SCR.

Subsequently, 76 locations on all Zonal Railways have started using the blended oil. Bio-Diesel plants at Tondiarpet/ Chennai and Raipur are under construction. Use of bio-diesel will result in reduction of Greenhouse Gases emissions, earning of carbon credits & saving of foreign exchange. Bio-diesel is also expected to be 5-10 % cheaper than High Speed Diesel.

### **CNG/LNG based Dual Fuel Diesel Engines for DEMU Trains**

Natural Gas usage emits less GHG compared to liquid fuels. Indian Railways have the distinction of being the only railway in the world to be using CNG run locomotives for passenger transportation. IROAF is pioneering implementation of CNG based dual fuel fumigation technology on CNG DEMUs DPCs of 1400 hp to achieve up to 20% substitution of Diesel.

Twenty-five Diesel Power Cars of DEMUs have been converted into CNG based dual fuel engine.

### **Green Stations**

Indian Green Building Council – Confederation of Indian Industry (IGBC-CII), developed Green Railway Stations Rating system to assess and facilitate the transformation of existing railway stations into eco-friendly ones.

Secunderabad Railway Station and Jaipur Railway Station achieved Green Railway Station Silver rating during the year 2017-18. Both these stations, were upgraded to Platinum rating during 2018-19.

Another 7 stations were assessed and certified in 2018-19. Kachiguda Station and Vijayawada Station of South-Central Railway achieved Gold rating. New Delhi Station of Northern Railway

and Howrah Station of Eastern Railway achieved Silver rating. Varanasi Station of North Eastern Railway, Katra Station of Northern Railway and Chennai Station of Southern Railway were also certified.

## Bio-toilets

In 2010, Indian Railways collaborated with Defence Research and Development Organisation (DRDO) for developing bio-toilets to prevent open discharge of human waste on Railway Tracks from trains.

'Swachh Rail, Swachh Bharat' campaign has been led by Indian Railways successfully as installation of bio-toilets in 95% trains across the Indian Railways network was complete by September, 2019<sup>16</sup>. More than 195,900 bio-toilets have been installed in nearly 53,900 coaches till March 2019, including 69,166 bio toilets fitted in 19,137 coaches during 2018-19. Out of 70,000 train coaches across the Indian Railways, only 2,300 train coaches are left for installation of bio-toilets installed in them as of October, 2019.

## Cutlery in IRCTC

In 2018 IRCTC decided to introduce bagasse based bio-degradable cutlery on eight Shatabdi and Rajdhani trains. Provision to collect the used cutlery that will be processed for disposal through composting was also planned.

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<sup>16</sup> [www.financialexpress.com/infrastructure/railways/great-news-indian-railways-installs-bio-toilets-in-95-train-coaches-100-target-t-be-achieved-in-3-months/1725541/](http://www.financialexpress.com/infrastructure/railways/great-news-indian-railways-installs-bio-toilets-in-95-train-coaches-100-target-t-be-achieved-in-3-months/1725541/)

## 5 GAPS & CHALLENGES THAT NEEDS TO BE ADDRESSED

### Challenges

The barriers are described as external and internal. External barriers relate to the political state and the suppliers. These barriers include lack of political will, limited mandate, lack of information, no push from the judiciary or consumer market, lack of incentives and absence of certifications and national eco-labeling programs.

Internal barriers are very specific to the organization, organization structure and procurement procedure. The internal barriers are mostly lack of awareness, lack of technical knowledge on sustainability specifications and cross-departmental functioning.

A barrier analysis was conducted by Indian Railways in 2010 and 2011 to understand the challenges for green procurement in 2010 and 2011. The findings of the barrier analysis are highlighted below.<sup>17</sup> Remarks are also made where relevant how some of these barriers are addressed.

#### Barriers in the External Environment

- Since, Ministry of Environment and Forests was expected to drive, implement and promote green procurement related laws, Indian Railways will have a limited role. (This barrier is now addressed by Ministry of Finance (MoF) by setting a Task Force described earlier that has a representation of Indian Railways)
- The judiciary may have to play a role in accelerating implementation of green procurement to influence markets and vendors (This expectation is unrealistic as there is no legislation today in India on green procurement)
- Public Procurement Bill, 2012 introduced in the Parliament was rejected.
- Lack of information on green alternatives
- Vendors lack of incentive for research & development of green alternatives
- Verification of vendor's claim

(These have been some of the major challenges and they need to be addressed by re-introducing schemes like Eco Mark, setting up peering mechanism, taking on active promotion of green products and offering fiscal incentives)

#### Internal Organizational Barriers

- There is a perception that green products cost more or they have lower technical functionality compared to conventional products. (This barrier can be addressed through greater involvement of RDSO in environmental matters)
- Financing and budgeting practices still favor direct cost savings in initial investments in public procurement.

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<sup>17</sup> Guenther, E., Hueske, A. K., Kumar, S., & Parthasarathy, R. (2017, November). Sustainable management at Indian Railways: how a self-evaluation tool for barrier analysis facilitates green procurement. In *uwf UmweltWirtschaftsForum| Sustainability Management Forum* (Vol. 25, No. 3-4, pp. 235-246). Springer Berlin Heidelberg.

- Environmental and social benefits of green products and services are not monetized nor provided any weight in tender evaluation and decision making. Life cycle costs not considered while evaluating a product or service
- Lack of awareness among internal stakeholders on IR's sustainability initiatives. (This barrier is now addressed through training programs that will be launched at NAIR, Vadodara in environmental management and sustainability)
- Lack of knowledge and expertise in using tools such as Lifecycle Assessment (LCA).
- Procurement officials are not aware of SPP and its strategic advantage over long run. (This barrier can be addressed by offering training programs on SPP at NAIR as proposed in the present project)
- The institutional set up of IR, as observed in Chapter 2 is complex. The Environmental & Housekeeping Directorate steers green initiatives in IR. This directorate is formed separately under the Railway Board and the zonal offices.
- Procurement is handled by the Member - Materials Management under the Railways Board. There is a need therefore to ensure inter-departmental interactions so that there is a smooth implementation of the SPP process.

#### Individual level barriers

- There is a perception that SPP will lead to additional workload

There is an inertia to change the existing procurement procedures (Both these barriers could be addressed through training on procurement officers and through sharing of experiences).

## **Vendor Management and Modifications in the Existing Procurement System**

At present Indian Public Sector Undertaking Units and DGS&D recognised suppliers are the major vendors to IR. If IR seeks to implement SPP, then it is expected that these vendors will need to align with the new technical or green specifications.

The Materials Management Department at the Railway Board level should undertake market outreach with vendors with the proposed SPP process, at least for the initial list of green products. The Department of stores will have to assess the availability of options, quality/functionality and price competitiveness. RDSO will need to modify the vendor registration process in asking for sustainability related information on the products and credentials.

The COS will need to modify the stages in tendering process like pre-qualification, evaluation criteria, verification, compliance monitoring, keeping all the concerned departments involved and building the required documentation. Further COS will also assess the pros and cons of various bidding and evaluation options including possibility of introducing a green tender scheme.

## Gaps to be Addressed

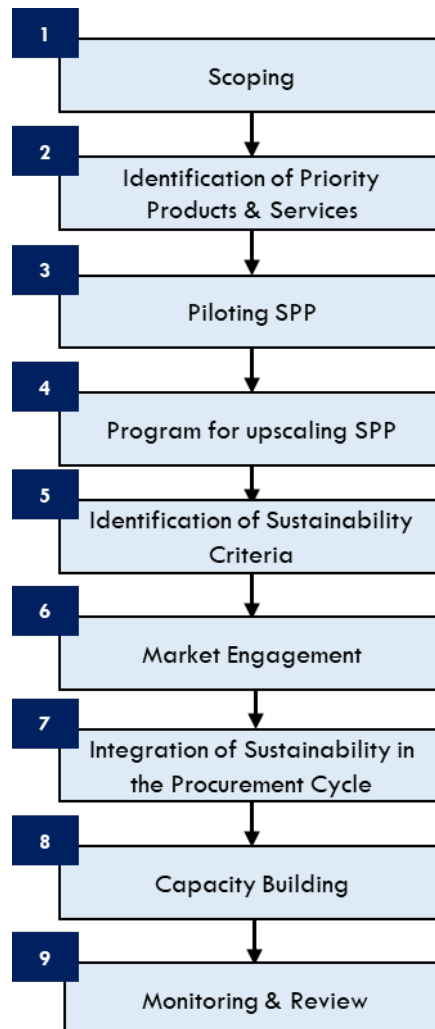
Based on the challenges described, some of the gaps that need to be addressed are presented in Box 3. Suggestions on how to address some of the gaps are also given

- **Absence of a SPP Policy and a Road Map** supported by Guidelines at Organizational level. (This Policy may take into account the Vision and Mission statements of the Environmental Directorate of IR and SPP experience of other international railway organizations as presented in Annexure A)
- **Absence of a priority list of products and services** with sustainability criteria and targets  
  
(IR may use the products recommended by the Task Force, use BEE star rating and existing certifications like CII's GreenPro) to create a product list with sustainable criteria. Key principles of circular economy may also be considered based on Annexure B of this report in identification of priority products and services)
- Although **several green initiatives** have been undertaken by Indian Railways, these **have not been leveraged under SPP**
- Market Readiness
  - Market study to identify sustainable alternatives fulfilling the functionality and being price competitive
- Vendor registration
  - Vendor registration to contain information on their sustainable practices/certifications if any
  - The success of SPP is dependent on the vendor's ability and capacity to supply sustainable goods and services
- Changes in the Bidding procedure to enable green procurement
  - Identification of entry points in the existing bidding process that can be modified or need for a separate bidding procedure
  - System for monitoring the progress made towards the targets and impact assessment
- Training and Capacity Building
  - Awareness on SPP at medium to top level and training of procurement officials and vendors on various aspects of SPP is currently absent

*Box 3: Gaps to be addressed for implementing SPP*

## 6 SUSTAINABLE PUBLIC PROCUREMENT OUTLINE ACTION PLAN

The Outline Action Plan for the implementation of Sustainable Public Procurement in the Indian Railways is depicted in Figure 9.



*Figure 9: SPP Outline Action Plan for Indian Railways*

### Scoping of Products/Services

For the purposes of scoping, it is proposed that following categories of products & services may be excluded in the implementation of SPP.

- (i) Products manufactured by Indian railways
- (ii) Imported products of high value
- (iii) Products & services provided by PSUs or DGS&D.

## Identification of Priority Products & Services

Identification of priority products will play an important role in the implementation of SPP. Following criteria is proposed (See Figure 10).

- a) Overall share of the product in IR procurement
- b) Alignment with products suggested by the SPP task force at MoF
- c) Alignment with ongoing Green Initiatives of the Indian Railways
- d) Environmental, Social and Economic benefits- across the life cycle
- e) GHG emission reduction
- f) Products with eco labels or cradle to cradle certification to promote Circular Economy (CE)
- g) Preference to recycled products without compromising the quality and avoiding environmental and social risks (Examples highlighted in Annexure B could be considered)
- h) International experience
- i) Contributing to NDC targets
- j) Market readiness, ensuring equivalent or superior functionally, availability & pricing

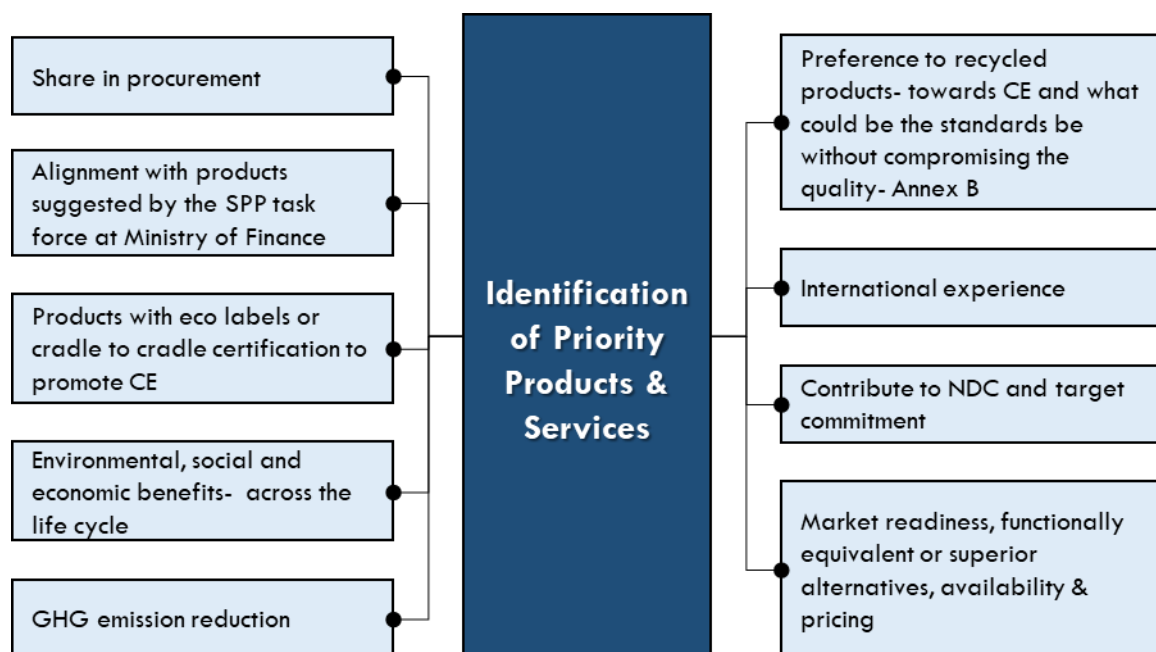


Figure 10: Identification of Priority Products & Services



## Piloting SPP

Considering the challenges, gaps identified and proposed framework, piloting of the SPP in IR may be undertaken as below. The experience from the pilot will build on and strengthen the implementation of SPP for a scale up.

Decision points needed on these steps have also been outlined. These points provide the basis for stakeholder consultation.

- Identify where the pilot will be established (Western Zone, Railway board or both)
- Decide on category of pilot to be established: Products/services or both
- Prepare long list and shortlist the products/services based on the proposed framework
- Develop technical specifications for the shortlisted products & services
- Identify existing procurement process followed and recommend change/strengthening
  - Vendor registration criteria
  - Use of 3<sup>rd</sup> party/ certification scheme
  - Products with eco labels or cradle to cradle certification to promote Circular Economy
  - Provisions in the MPG
  - Bidding process- identify pre-qualification criteria, evaluation criteria
- Conduct training and build capacity of the procurement officers and the environment department at NAIR
- Monitor and track after the award
- Identify challenges faced during implementation of the pilot
- Report on the learnings and benefits
- Prepare a plan for expanding/upscaling the pilot

Figure 10 presents the above steps

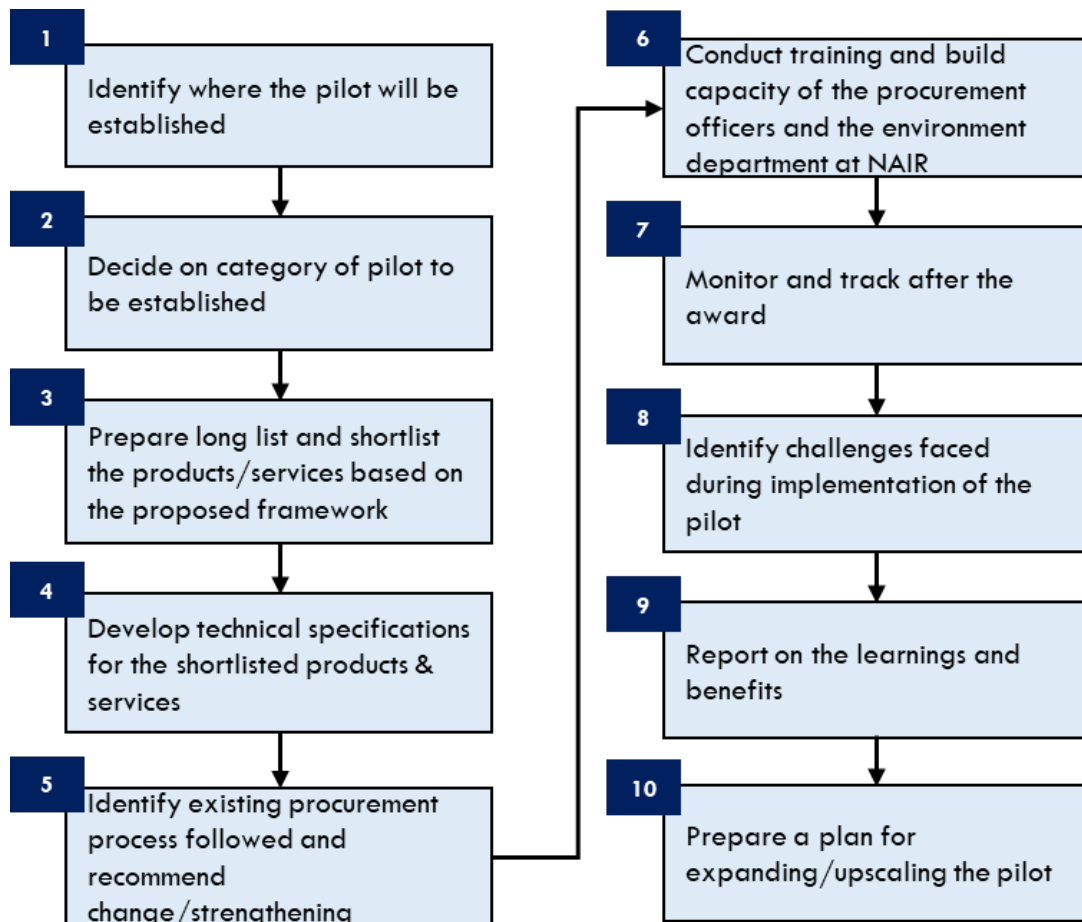


Figure 11: Flowchart for Piloting SPP

### Program for upscaling SPP

Based on the pilot experience, a program for upscaling SPP will be formulated. A steering committee for implementation with key officials from different departments will be formed. This committee will be responsible for implementation, oversight and monitoring performance.

The SPP program will include targets, priorities, timeframe, list of prioritized products/services, teams responsible for implementation and mechanism for monitoring performance. This program should be aligned with the existing initiatives of IR's Environment Directorate.

Once the program is set, an implementation plan is to be established outlining specific tasks with responsibilities. This program needs to be communicated to all divisions of the Railway Board and other agencies particularly to the officials most affected and to suppliers who have a role to play in implementing the program.

## Identification of Sustainability Criteria

A common sustainability criterion set enabling assessment of sustainability performance of products across their life cycle will be formulated. Criteria based on materials and production process specification can also be listed. For each criteria a verification method will also be determined in terms of manufacturer's certificate, supplier declaration, test certificates etc. Ecolabels and certifications satisfying the sustainability criteria will also be identified.

## Market Engagement

The market engagement process enables to identify potential vendors, build their capacity in the market to meet the sustainability requirements and inform the modification in the procurement and contract process. Engaging the market can help build trust and confidence with suppliers, create market conditions, showcase best examples and encourage innovations.

## Integration of Sustainability in the Procurement Cycle

A review of the existing procurement procedures for the products and services identified will be imperative. This study will enable IR officials to understand the stages at which sustainability aspects can be introduced and the method of integration in the procurement cycle.

The Figure 12 presents an illustration of how sustainability can be incorporated in the existing procurement process in IR.

In the Raising of Indents- Estimation of Needs stage a needs analysis for the goods/services in terms of correct volume and evaluating methods to reduce consumption is required. This is followed by a market research for availability of the goods/services as per the sustainability requirements. For the bidding, the title should communicate the intention of procurement under SPP which makes it easier for prospective vendors to promptly recognize requirement.

The second stage of Consolidation of requirements & specifications will involve defining Technical specifications on environmental and social requirements. These specifications also need to ensure that there is no compromise on product quality and functionality.

A prequalification criterion to identify and register a vendor will be based on sustainability performance. The vendors will be assessed based on their compliance with environmental legislation and adherence to national social regulations and standards.

A standard bidding document with inclusion of sustainability criteria in the technical specifications, evaluation methodology and contract will be formulated to guide issue of tenders.

A framework for evaluation of bids will be developed. This framework will have a scoring system to check the bids on SPP for vendor pre-qualification on sustainability criteria, evaluation of the goods/service for the sustainability criteria listed in the technical specifications and the life cycle costing.

To execute a contract for the supply of goods/service an agreement is signed between the supplier and IR. This contract stipulates clauses on warranties, performance parameters,

responsibilities of the supplier, maintenance schedules and end of life management. Sustainability requirement criteria for each of above clauses will be introduced to bind the supplier in delivering a sustainable product/service across its life cycle. A SPP guideline will be prepared for procurement officials in each stage to ensure smooth transition.

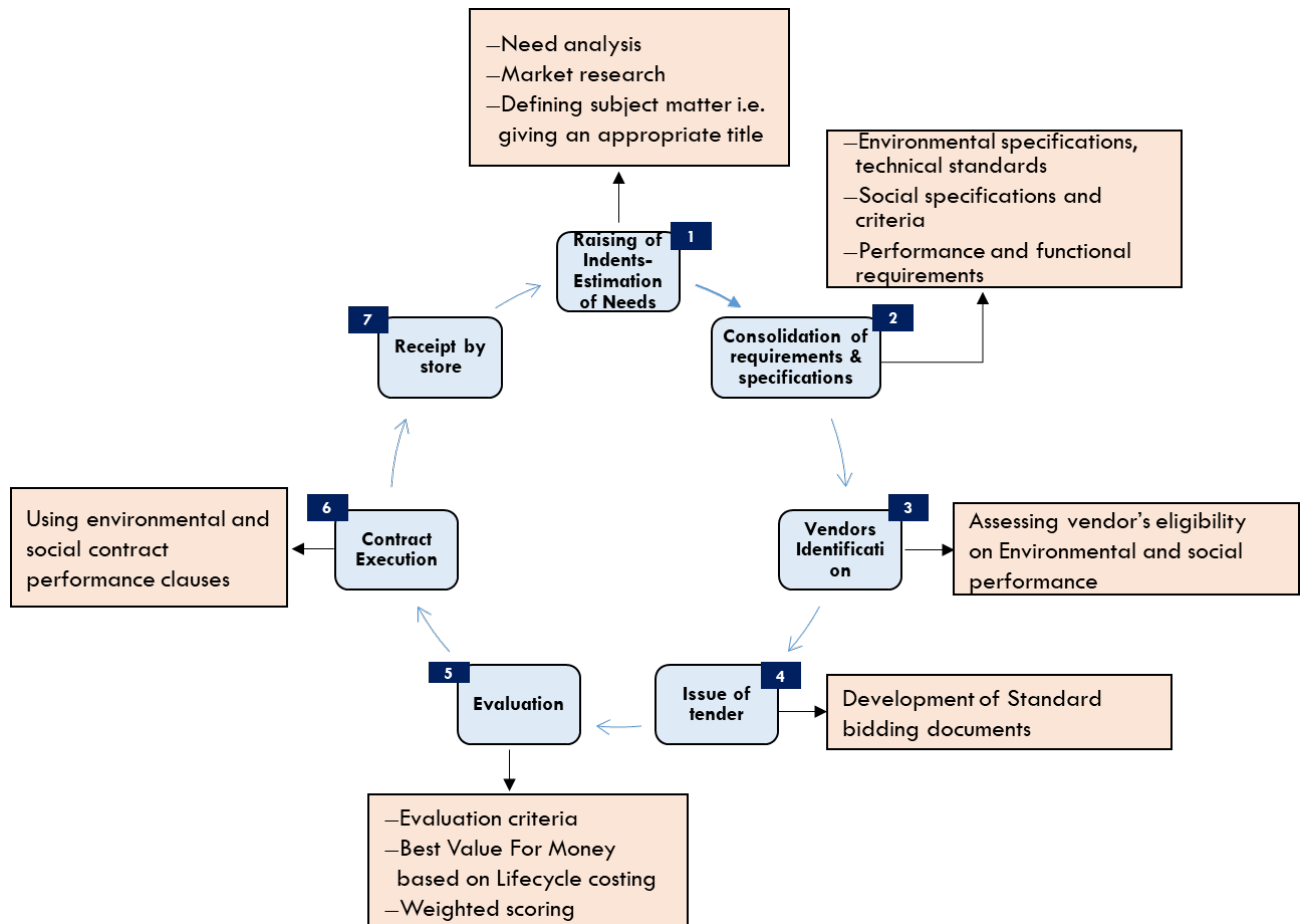


Figure 12: Incorporation of sustainability in the Procurement Process- an illustration

## Capacity Building

A capacity building program targeting procurement officials on the changes of the procurement activities will be required. Officials will need adequate training on sustainability integrated detailed functions such as preparation of technical specifications, tender documents, evaluation of prequalification and bidding documents, among others. SPP guidelines will be developed to be used by public procurers.

## Monitoring & Review

To drive continuous improvement and effectively target the life-cycle environmental impact and costs of goods and services purchased, a monitoring system will be needed. This would involve working directly with suppliers and departments where the goods have been used. Data related to the performance of each SPP criteria will be collected and analyzed.

Best practices and learnings from all products/services implemented will be documented. The current set of activities will be reviewed for further strengthening.

Table 1 outlines the steps, activities and the implementation agencies.

*Table 1: Outline Action Plan*

#	Outline Steps	Implementation Agencies	Activities
1.	Scoping of Products & Services	Railway Board, Zonal COS, IRILMM	<ul style="list-style-type: none"> <li>Development of a master list of Products &amp; services within the scope of SPP</li> </ul>
2.	Identification of Priority Products/Services	Railway Board, Environment Directorate, Zonal COS, IRILMM	<ul style="list-style-type: none"> <li>Determination of criteria to prioritize products/services from the master list</li> <li>Evaluation of products /services based on the criteria</li> <li>List of priority products &amp; services</li> </ul>
3.	Piloting SPP	Railway Board, Zonal COS, NAIR, RDSO, IRILMM, MoF SPP Taskforce	<ul style="list-style-type: none"> <li>Identification of select priority products for the pilot phase</li> <li>Identification of zonal railways or Railway Board where the pilot will be established</li> <li>Technical specifications for the shortlisted products &amp; services</li> <li>Identification of interventions in the existing procurement process</li> <li>Training of procurement officials</li> <li>Monitoring and tracking performance</li> <li>Document Experiences &amp; challenges</li> </ul>
4.	Program for upscaling SPP	Railway Board, Zonal COS, NAIR, RDSO, IRILMM, MoF SPP Taskforce	<ul style="list-style-type: none"> <li>Development of a SPP steering committee</li> <li>Development of a program for expanding/upscaling the pilot</li> <li>Formulation of an implementation plan</li> </ul>
5.	Identification of Sustainability Criteria	Railway Board, Zonal COS, NAIR, RDSO, IRILMM, BIS, Professional Certification bodies, Research & Academic Institution	<ul style="list-style-type: none"> <li>Development of a common core and product specific sustainability criteria</li> <li>Identification of eco-labels &amp; certifications relevant for the shortlisted products/services</li> </ul>
6.	Market Engagement	Railway Board, Zonal COS, NAIR, RDSO, IRILMM	<ul style="list-style-type: none"> <li>Identification of potential vendors</li> <li>Consultation workshops with vendors</li> </ul>

<b>7. Integration of Sustainability Initiatives</b>	Railway Board, Zonal COS, NAIR, RDSO, IRILMM, Rail India Technical and Economic Services Ltd	<ul style="list-style-type: none"> <li>• Identification of interventions at each stage of the procurement cycle</li> <li>• Create supporting documentation for above</li> <li>• Development of a SPP guideline for procurement officials</li> </ul>
<b>8. Capacity Building</b>	Railway Board, Zonal COS, NAIR	<ul style="list-style-type: none"> <li>• Development of training materials on SPP</li> <li>• Organization of trainings for procurement officers at NAIR</li> </ul>
<b>9. Monitoring &amp; Review</b>	Railway Board, Zonal COS, RDSO, Rail India Technical and Economic Services Ltd	<ul style="list-style-type: none"> <li>• Development of indicators to track performance</li> <li>• Conduct of periodic review for feedback and adaptations</li> </ul>

## 7 PROPOSED STAKEHOLDER CONSULTATION AND TOPICS FOR DISCUSSION

In order to obtain a feedback on the scoping report, proposed framework and steps for implementing the pilot, a stakeholder consultation meeting is proposed. Sections below present topics that need to be discussed and stakeholders who could be invited.

### Topics for Discussions

The proposed topics for discussion are described in Box 4

<p>a) Improvement of SPP framework condition:</p> <ul style="list-style-type: none"> <li>• Process for Formation of Draft SPP Policy (Guiding and Operational Principles)</li> <li>• Would the Entry points for SPP be             <ul style="list-style-type: none"> <li>○ Centralized or Decentralized?</li> <li>○ If decentralized, in which zone should it be implemented?</li> </ul> </li> <li>• Comments on framework to identify Priority Products &amp; Services</li> </ul> <p>b) Details of the Pilot Project:</p> <ul style="list-style-type: none"> <li>• Suggestions on the Products/Services that may be considered for the Pilot</li> <li>• Opinion on market readiness &amp; alternatives</li> <li>• Identification of team at IR that will oversee the pilot implementation</li> <li>• Timelines for implementation of pilot</li> <li>• Training of procurement officers and environment department on SPP</li> <li>• Workshop on modification of existing procurement process for implementation of the pilot</li> </ul>
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*Box 4: Proposed key topics for discussion*

### Stakeholders to be invited for the consultation workshop

A list of stakeholders (not limited to) to be invited for the consultation workshop is given in Table 2.

*Table 2: List of stakeholders to be invited for the consultation workshop*

<p><b>Indian Railways:</b></p> <ul style="list-style-type: none"> <li>• Ministry of Railways- Railway Board</li> <li>• Environment Directorate</li> <li>• PCMM- of different zones, especially Western zone</li> <li>• IRCTC</li> <li>• RDSO</li> </ul>	<p><b>Apex Environmental Bodies:</b></p> <ul style="list-style-type: none"> <li>• MoEFCCC- Resource Efficiency Cell Director, Joint Secretary</li> <li>• CPCB- Member Secretary, Director of Eco Mark</li> </ul>
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<ul style="list-style-type: none"> <li>• NAIR</li> </ul>	
<p><b>Other Key Governmental Institutions:</b></p> <ul style="list-style-type: none"> <li>• Ministry of Finance</li> <li>• Members of the Task Force on SPP</li> <li>• Bureau of Indian Standards</li> <li>• Ministry of Consumer Affairs</li> </ul>	<p><b>Think-tanks and Associations:</b></p> <ul style="list-style-type: none"> <li>• CII</li> <li>• TERI</li> <li>• FICCI</li> <li>• Development Alternatives</li> </ul>
<p><b>Other Institutions</b></p> <ul style="list-style-type: none"> <li>• UNEP- PAGE</li> <li>• GIZ</li> </ul>	<p><b>PSUs:</b></p> <ul style="list-style-type: none"> <li>• BHEL</li> <li>• NTPC</li> <li>• DGS&amp;D</li> <li>• KVIC</li> <li>• ACASH</li> </ul>
<p><b>Private sector:</b></p> <ul style="list-style-type: none"> <li>• Bombardier</li> <li>• Alstom</li> </ul>	<p><b>Research and Academia</b></p> <ul style="list-style-type: none"> <li>• IITs</li> <li>• NEERI</li> </ul>



# ANNEXURES

## A. Desk research on norms, standards and status of SPP for selected organisations of the international railroad network sector

The assessed railway organisations include DB Germany, SNCF France, SBB Switzerland and ÖBB Austria. The amount of information publicly available varies per organisation, thus this chapter does not aim to compare the described railway organisations with each other but rather to give a general picture of the efforts and status quo of the selected railway organisations towards sustainable public procurement. In addition, the industry initiative Railsponsible is briefly described in the following, as Deutsche Bahn (DB) and SNCF are two of the founding members.

### Industry Initiative: Railsponsible

Railsponsible focusses on sustainable procurement in the railway industry. It was established in 2015 by the Chief Procurement Officers of six leading companies of the railway industry, with Deutsche Bahn (DB) and SNCF as two of the founding members. The initiative aims at improving the industry's supply chain and procurement strategies towards more sustainable and environmental practices, through capacity building and best practices sharing. Railsponsible is open to all companies and railway operators across the railway industry value chain.

Figure 13: Current members of Railsponsible Initiative (Source: <https://railsponsible.org/about-us/#members>)



## Norms, standards and status of SPP of four internationally operating railway organizations

Country: Germany	Organization: Deutsche Bahn AG (DB)
<p>Deutsche Bahn AG (DB) is a railway company owned by the German state. Procurement as a group function for DB AG is centrally organised and sustainable procurement is reflected through the group strategy and procurement guidelines. DB is a founding member of the Railsponsible Initiative, founded in 2015, and supports their claims and targets for sustainable procurement in the railroad sector.</p> <p>In 2019, 1.2 million orders with a procurement volume of €20 billion for DB Schenker &amp; DB Arriva were processed. DB maintained contracts with around 19,000 suppliers of which 575 suppliers realize 80% of the purchasing volume. More than 550 suppliers, accounting for 60% of the top purchasing volume, have already submitted an evaluation with regard to the management system and its activities and results in accordance with CSR criteria. (Eco-Vadis or similar). The Code of Conduct for Business Partners is based on UN Global Compact Principles.</p> <p>In 2019, a Supplier Management and Rating Tool (SMaRT) was introduced, which allows an efficient supplier management on a digital platform.</p>	
<h3>Status of SPP</h3>	
<p>Good practice examples in procurement</p>	<ul style="list-style-type: none"> <li>● Green Evaluation IT-Tool evaluates raw material and energy consumption of the respective product in the manufacturing process and shows CO<sub>2</sub> balance of the product</li> <li>● DB Marketplace platform for DB employees indicates office supplies with ecologic labels such as the Blue Angel, FSC and the EU Ecolabel</li> <li>● Coffee and tea products in on-board bistros certified with FairTrade Label</li> <li>● Square paved stones named RC40 made out of 40% recycling material used in train stations. By 2025, 75 train stations will be paved with RC40 stones: <ul style="list-style-type: none"> <li>● Environmental impact: the stones are made out of 40% recycling material and thus, saves raw materials. Production and delivery of stones is climate-neutral.</li> </ul> </li> </ul>
<h3>Norms &amp; standards</h3>	
<p>Environmental management system certification</p>	<ul style="list-style-type: none"> <li>● DIN ISO 14001 applied by Deutsche Bahn</li> <li>● No EMAS certification</li> </ul>
<p>CSR standards</p>	<p>DB applies the following standards and labels:</p> <ul style="list-style-type: none"> <li>● UN-Global-Compact-Index</li> <li>● Global Reporting Initiative Standards (“Core”)</li> <li>● World-Class Procurement Audit: Status Professional</li> </ul>

<p><b>Sources:</b></p> <ul style="list-style-type: none"> <li>• DB (2020). Integrierter Bericht 2019. Anhang zur Nachhaltigkeit - Umsetzung Strategie Starke Schiene. Available at: <a href="https://ibir.deutschebahn.com/2019/de/anhang-zur-nachhaltigkeit/einkauf/-beschaffung/umsetzung-strategie-starke-schiene">https://ibir.deutschebahn.com/2019/de/anhang-zur-nachhaltigkeit/einkauf/-beschaffung/umsetzung-strategie-starke-schiene</a></li> <li>• DB (). Innovationsmanagement bei der Beschaffung der Deutschen Bahn. Bahn aktuell 9/2019. Available at: <a href="https://www.system-bahn.net/wp-content/themes/systembahn/includes/readpdf.php?file=27188">https://www.system-bahn.net/wp-content/themes/systembahn/includes/readpdf.php?file=27188</a></li> <li>• DB (2020). Official Website: Compliance/ Geschäftspartner. Available at: <a href="https://www.deutschebahn.com/de/konzern/compliance/geschaeftpartner/verhaltenskodex-1191674">https://www.deutschebahn.com/de/konzern/compliance/geschaeftpartner/verhaltenskodex-1191674</a></li> <li>• Railsponsible (2018). Climate Change Position Paper. Available at: <a href="http://railsponsible.org/download/climate-change-position-paper/">http://railsponsible.org/download/climate-change-position-paper/</a></li> <li>• <a href="https://gruen.deutschebahn.com/de/massnahmen/bueromaterial">https://gruen.deutschebahn.com/de/massnahmen/bueromaterial</a></li> <li>• <a href="https://gruen.deutschebahn.com/de/massnahmen/pflastersteine">https://gruen.deutschebahn.com/de/massnahmen/pflastersteine</a></li> <li>• <a href="https://gruen.deutschebahn.com/de/massnahmen/oekobilanzierung">https://gruen.deutschebahn.com/de/massnahmen/oekobilanzierung</a></li> <li>• <a href="https://gruen.deutschebahn.com/de/massnahmen/faire-produkte">https://gruen.deutschebahn.com/de/massnahmen/faire-produkte</a></li> </ul>	
<p>Contact points: Hans-Christoph Schwaerzler, DB AG</p>	

<b>Country:</b> <b>France</b>	<b>Organization:</b> <b>Société nationale des chemins de fer français (SNCF Group)</b>
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The Société nationale des chemins de fer français (SNCF Group), owned by the French State, comprises the enterprises SNCF Réseau, SNCF Gares & Connexions, Fret SNCF and SNCF Voyageur. SNCF is a founding member of the Railsponsible Initiative in 2015 and supports their claims and targets for sustainable procurement in the railroad sector. The “Responsible Procurement” unit provides procurement services to the SNCF Group. Their Excellence 2020 initiative includes an “Excellence in Procurement programme”, which is designed to make suppliers and employees safer, raise the quality of their suppliers, apply digital technology and to forge close relationships with the suppliers.

The procurement volume in 2019 equalled €16.6 billion and around 31,000 suppliers, with a strong focus on purchases made in France. In 2017, 48% of contracts (by value) included a mandatory CSR criterion. Furthermore, 22% of suppliers were considered to have an advanced level of CSR maturity in 2017 (grade EcoVadis >65/100). The ethical procurement charter includes that the specifications and tender documents must aim at this promotion in accordance with the principles of corporate social responsibility (ISO 26000, GRI, and Global Compact Principles). The Code of Conduct for Business Partners is based on UN Global Compact Principles.

**Status of SPP**

<p>Good practice examples in procurement of product groups</p>	<ul style="list-style-type: none"> <li>• SNCF and their supplier Alstom develop modified hybrid trains for regional lines, these will begin running in 2021. The hybrid trains will replace TER diesel-powered trains and cut energy consumption by 20%. Furthermore, a 30-50% drop in maintenance costs is expected and 20% less greenhouse gas emissions produced</li> <li>• For ensuring better air quality in train stations SNCF is partnering with Tallano Technologie to develop tamic®, a device that captures fine particulates that are emitted by train brakes</li> </ul>
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	<ul style="list-style-type: none"> <li>• SNCF signed a 25-year-contract with energy supplier Voltalia to purchase solar power. The annual production of the three power plants will be 200 GW-hour and is one step to boost SNCF's use of renewable energies.</li> <li>• To replace fossil fuels in the short term, SNCF along with IFPEN (French institute for oil and new energies) conducts tests on B100 rapeseed biofuel in a Régiolis engine</li> <li>• SNCF has partnered with Mitsubishi Electric to develop a new transformer that is oil-cooled but also cooled through the natural passage of air on the roof. It saves 4% of energy compared with the conventional transformer and the sound emissions are reduced by 13 decibels. 70% less maintenance operations will be required and it may be applied to more kinds of SNCF rolling stock</li> </ul>
<b>Norms &amp; standards</b>	
Environmental management system certification	<ul style="list-style-type: none"> <li>• no EMAS certification</li> <li>• no companywide DIN ISO 14001</li> </ul>
CSR standards	<p>SNCF applies the following standards and labels:</p> <ul style="list-style-type: none"> <li>• Certification for Responsible Procurement and Supplier Relations (French label, backed by the standard ISO 20400:2017)</li> <li>• UN Global Compact Advanced</li> <li>• Corporate social engagement report backed by GRI standards and ISO 26000 guidelines</li> <li>• External audit scores: EcoVadis: 79/100 ; Vigeo Eiris 66/100</li> </ul>
Targets for sustainable procurement	<ul style="list-style-type: none"> <li>• SNCF aims to have around 60 percent of the procurement volume covered by an Ecovadis certificate by 2020</li> <li>• By 2020, 34% of suppliers are considered to have an advanced level of CSR maturity</li> <li>• Introduce a greenhouse gas (GHG) assessment clause into each transport and logistic contract</li> </ul>
<p>Sources:</p> <ul style="list-style-type: none"> <li>• <a href="https://www.sncf.com/en/group/suppliers/our-commitments">https://www.sncf.com/en/group/suppliers/our-commitments</a></li> <li>• <a href="https://www.sncf.com/en/group/suppliers/procurement-system">https://www.sncf.com/en/group/suppliers/procurement-system</a></li> <li>• <a href="http://railsponsible.org/download/climate-change-position-paper/">http://railsponsible.org/download/climate-change-position-paper/</a></li> <li>• <a href="https://www.sncf.com/en/commitments/sustainable-development/stakeholder-ecosystem">https://www.sncf.com/en/commitments/sustainable-development/stakeholder-ecosystem</a></li> <li>• <a href="https://www.sncf.com/en/commitments/cse-priorities/sncf-accelerates-hydrogen-trains">https://www.sncf.com/en/commitments/cse-priorities/sncf-accelerates-hydrogen-trains</a></li> <li>• <a href="https://www.sncf.com/en/innovation-development/innovation-research/cleaner-air-in-paris-region-stations">https://www.sncf.com/en/innovation-development/innovation-research/cleaner-air-in-paris-region-stations</a></li> <li>• <a href="https://tech.sncf.com/en/a-cool-concept-for-an-innovative-transformer/">https://tech.sncf.com/en/a-cool-concept-for-an-innovative-transformer/</a></li> <li>• <a href="https://medias.sncf.com/sncfcom/finances/Publications_Groupe/SNCF_Group_Financial_Report_2019.pdf">https://medias.sncf.com/sncfcom/finances/Publications_Groupe/SNCF_Group_Financial_Report_2019.pdf</a></li> </ul>	
Contact points: David Paris, SNCF	

<b>Country: Austria</b>	<b>Organization: Austrian Federal Railways (ÖBB)</b>
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Austrian Federal Railways (ÖBB) is the national railway operator and owned by the Republic of Austria. Purchasing is organised according to a lead buyer concept, the internal service provider ÖBB-Business Competence Centre GmbH (ÖBB-BCC) summarises all the group's purchasing agendas centrally. ÖBB joined the Railsponsible Initiative in 2018 and since then is supporting their targets for sustainable procurement in the railway sector.

In 2019, ÖBB maintained contracts with around 10,000 suppliers and their procurement volume equals €2 billion per year. Around 3,000 contracts are available in electronic catalogues with some 550,000 different order items in more than 500 product groups. The Austrian federal procurement law sets the rules for procurement decision. Environmental criteria are taken into consideration in the award criteria and in the specifications, such as resource consumption, environmentally harmful ingredients, emissions in the production process, degree of recyclability, and others.

#### Status of SPP

Good practice examples in procurement of product groups	<ul style="list-style-type: none"> <li>• ÖBB-uniforms are certified by the bluesign standard und BSCI code of conduct</li> <li>• All coffee types must be certified with the Fairtrade label</li> <li>• The invitations to tender specify that the electricity mix purchased by the suppliers must consist of renewable sources</li> <li>• Motor vehicle fleet management: <ul style="list-style-type: none"> <li>• Ecological Impact: CO<sub>2</sub> emissions have been reduced by considering ecological quality criteria in procurement process and by continuously renewing the fleet of motor vehicles. Currently, seven vehicles with Euro 4 engines, 752 with Euro 5 engines, 2,546 vehicles with Euro 6 engines and 47 electric vehicles are in operation. In order to further promote this positive development, special attention is being paid to the ecologization of the vehicle fleet in the procurement of motor vehicles. Criteria for emissions (both CO<sub>2</sub> and NOX) and fuel consumption were specified and evaluated.</li> </ul> </li> </ul>
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#### Norms & standards

Environmental management system certification	<ul style="list-style-type: none"> <li>• EMAS certification of the subsidiary ÖBB Technische Services GmbH</li> <li>• DIN ISO 14001 applicable to ÖBB Technische Services GmbH, ÖBB Produktion GmbH, ÖBB-Rail Cargo Austria AG</li> </ul>
CSR standards	<p>ÖBB applies following standards:</p> <ul style="list-style-type: none"> <li>• GRI-Standards (core)</li> <li>• UN-Global-Compact-Principles</li> </ul>

Targets for sustainable procurement	<ul style="list-style-type: none"> <li>• ÖBB aims to have around 60 percent of the procurement volume covered by an Ecovadis certificate</li> </ul>
Sources:	
<ul style="list-style-type: none"> <li>• ÖBB Infrastruktur (2010). Nachhaltige Beschaffung – Ein Wegweiser. Available at: <a href="http://www.nachhaltigebeschaffung.at/sites/default/files/OEBB_Nachhaltige_Beschaffung_Ein_Wegweiser_web_0.pdf">http://www.nachhaltigebeschaffung.at/sites/default/files/OEBB_Nachhaltige_Beschaffung_Ein_Wegweiser_web_0.pdf</a></li> <li>• ÖBB Holding AG (2018). Nachhaltigkeitsbericht 2017/2018. Available at: <a href="https://konzern.oebb.at/de/nachhaltigkeit/nachhaltigkeitsberichte">https://konzern.oebb.at/de/nachhaltigkeit/nachhaltigkeitsberichte</a></li> <li>• ÖBB Holding AG (2019). Wir sind Klimaschutz - ÖBB Klimaschutzstrategie 2030. Available at: <a href="https://bcc.oebb.at/de/unsere-leistungen/einkauf">https://bcc.oebb.at/de/unsere-leistungen/einkauf</a></li> <li>• ÖBB Holding AG (2017). Nachhaltigkeitsbericht 2016/2017. Available at: <a href="https://konzern.oebb.at/de/nachhaltigkeit/nachhaltigkeitsberichte">https://konzern.oebb.at/de/nachhaltigkeit/nachhaltigkeitsberichte</a></li> </ul>	
Contact point: n/a	

<b>Country:</b> Switzerland	<b>Organisation:</b> Swiss Federal Railways (SBB)
<p>Swiss Federal Railways (SBB) is a railway company owned wholly by the Swiss state. The group division “supply chain management” is responsible for the group-wide management of the entire value chain - from specification to procurement, production, distribution and disposal. SBB joined the Railsponsible Initiative in 2017 and supports their targets for sustainable procurement in the railroad sector.</p> <p>In 2019, SBB awarded contracts worth CHF 5.65 billion (€5.28 billion) to their 15,542 suppliers. EcoVadis have already certified 85 suppliers, accounting for 34% of the purchasing volume, with regard to the management system and its activities in accordance with CSR criteria; this is now to become standard for critical product groups. SBB suppliers must comply with ISO 140001 certification and SBB requires an amfori audit in certain tenders (in some as a suitability criterion). Ecologically specified criteria are developed directly in the tendering process.</p>	
<b>Status of SPP</b>	
Good practice examples in procurement of product groups	<ul style="list-style-type: none"> <li>• In the product group work wear / textiles, the share of products certified according to CSR criteria is particularly high compared to the other product groups. There are many ecological alternatives for textiles, which are increasingly being used. Furthermore, a large part of SBB clothing will be given a second life starting in 2020 by donating it to the Swiss Red Cross.</li> <li>• All materials supplied for fasteners must be wrapped in specific Polyethylene film, which can be easily recycled by further processing.</li> </ul>
<b>Norms &amp; standards</b>	
Environmental management system certification	<ul style="list-style-type: none"> <li>• No companywide EMAS certification</li> <li>• DIN ISO 14001 applicable to SBB Cargo AG, SBB GmbH Germany</li> </ul>

CSR standards	<p>SBB applies following standards:</p> <ul style="list-style-type: none"> <li>● GRI-Standards (core)</li> <li>● UN-Global-Compact-Principles</li> </ul>
Targets for sustainable procurement	<ul style="list-style-type: none"> <li>● By 2020, SBB intends to incorporate environmental and social aspects specific to each product group into all commodity group strategies</li> <li>● SBB aims to have around 60 percent of the procurement volume covered by an Ecovadis certificate, thereby ensuring sustainability for SBB in critical product groups</li> <li>● SBB plans to assess top and risk suppliers according to ecological and social criteria by 2020 and to systematically train buyers on ecological and social issues</li> </ul>
<p>Sources:</p> <ul style="list-style-type: none"> <li>● SBB (2019). Geschäfts- und Nachhaltigkeitsbericht 2018. Bern.</li> <li>● <a href="https://www.sbbcargo.com/de/unternehmen/qualitaet-sicherheit-umwelt/zertifikate.html">https://www.sbbcargo.com/de/unternehmen/qualitaet-sicherheit-umwelt/zertifikate.html</a></li> <li>● <a href="http://railsponsible.org/download/climate-change-position-paper/">http://railsponsible.org/download/climate-change-position-paper/</a></li> <li>● SBB (2020). Nachhaltigkeitsbericht 2019. Available at: <a href="https://company.sbb.ch/de/medien/publikationen/geschaefts-nachhaltigkeitsbericht/nachhaltigkeitsberichterstattung-2019.html">https://company.sbb.ch/de/medien/publikationen/geschaefts-nachhaltigkeitsbericht/nachhaltigkeitsberichterstattung-2019.html</a></li> </ul>	
<p>Contact point: Mia Peric, SBB</p>	

## B. International Examples of Good Practices in the Waste Sector and Circular Economy Considerations

SNCF Circular Economy Policy	
Country: France	Organization: Société nationale des chemins de fer Français (SNCF Réseau)
The SNCF Group implements a circular economy policy with actualized priority subjects every year. Core approaches at the subsidiary SNCF Réseau to implement the policy are rolling stock dismantlement and infrastructure components recovery.	
Implementation timeframe	<ul style="list-style-type: none"> <li>• Circular economy (CE) policies implemented since 2013</li> <li>• First circular economy strategy for a 5-year period was launched in 2013</li> <li>• Strategy was updated in 2017 (period: 2017-2020)</li> </ul>
Responsible organizational unit	<ul style="list-style-type: none"> <li>• Circular economy policies are adopted at SNCF Group Level (parent company)</li> <li>• Subsidiary SNCF Réseau (manages, maintains and develops the French rail network) is responsible for the implementation</li> </ul>
Actions taken	<ol style="list-style-type: none"> <li><b>1. Dismantling and recycling of rolling stock</b> <ul style="list-style-type: none"> <li>• 90% of each TGV train is recycled (recyclable materials such as (stainless) steel, copper and electric motors make up large parts of the rolling stock) <ul style="list-style-type: none"> <li>○ SNCF sets up special breakup facilities and pools the generated waste</li> </ul> </li> <li>• In 2016, 5-year contract was awarded to break up 250 electric multiple units (EMUs)</li> <li>• 250 of wagons laid end to end are set to be dismantled by 2028</li> </ul> </li> <li><b>2. Reclaiming/valorising track components</b> <ul style="list-style-type: none"> <li>• Objective: develop new ways to recycle valuables, ensure traceability of all materials that enter the yard and build an innovative, responsible business model</li> </ul> <ol style="list-style-type: none"> <li><b>2.1 Ballast</b> <ul style="list-style-type: none"> <li>• Reuse for railway purpose after screening or recomposition</li> <li>• Direct reuse on mobile sites of 30 to 50% of the ballast on the track</li> </ul> </li> <li><b>2.2 Rails</b> <ul style="list-style-type: none"> <li>• 97.3% of rails were recycled in 2019</li> <li>• Reuse of rails for railway purposes (if level of wear allows)</li> <li>• Reuse of high speed line rails on secondary service tracks</li> <li>• Recycling through local sectors: sale and redesign of steel</li> <li>• Recycling of ferrous metals in rails: <ul style="list-style-type: none"> <li>○ reused to manufacture iron and concrete</li> <li>○ transformation of deposits into chips, packages, briquettes and shots</li> </ul> </li> </ul> </li> <li><b>2.3 Wooden Sleepers</b></li> </ol> </li> </ol>



	<ul style="list-style-type: none"> <li>• Energy recovery for the production of industrial steam (paper etc.) or cement plants</li> <li>• Improving traceability of removal process of sleepers</li> </ul> <p><b>2.4 Concrete Sleepers</b></p> <ul style="list-style-type: none"> <li>• Crushing of old sleepers: heavy pieces can be reused as road sub-layer or for construction of sewage systems</li> <li>• R&amp;D on future potential for reuse as gutters, walls, gabions or street furniture</li> </ul> <p><b>2.5 Non-Ferrous Metals (included in catenary cables etc.)</b></p> <ul style="list-style-type: none"> <li>• Material recovery rate of non-ferrous metals: 98% as supply for steel mills, refineries and foundries</li> </ul>
<b>Benefits</b>	
Economic	<ul style="list-style-type: none"> <li>• 45 million of SNCF Réseau's 2018 revenue came from sales of end-of life materials</li> <li>• Between 2017 and 2018, revenue from reclaiming discarded materials rose by 20%</li> <li>• Reduction of the realms of land for the supply and de-supply of building sites through reuse of ballast</li> </ul>
Environmental	<ul style="list-style-type: none"> <li>• Reduced pressure on natural resources and the impacts associated with the extraction of virgin aggregate</li> <li>• Reduced energy consumption and emissions related to the transportation of materials</li> </ul>
Social	n/a
<p>Sources:</p> <ul style="list-style-type: none"> <li>• SNCF (2017): Corporate Social Engagement Report 2017: SNCF – Delivering Useful, Open Mobility. Available at: <a href="http://medias.sncf.com/sncfcom/rse/bilanrse/CSR_Annual_Report_EN.pdf">http://medias.sncf.com/sncfcom/rse/bilanrse/CSR_Annual_Report_EN.pdf</a>.</li> <li>• SNCF Réseau (2028): Agorize Circular Economy Challenge: Material Sheets. Available at: <a href="https://www.agorize.com/de/challenges/sncf-economie-circulaire/pages/ressources?lang=en">https://www.agorize.com/de/challenges/sncf-economie-circulaire/pages/ressources?lang=en</a> (Material Sheets direct download available at: <a href="https://cdn.fs.agorize.com/DWfsNv69QYm72OezDiq2">https://cdn.fs.agorize.com/DWfsNv69QYm72OezDiq2</a>)</li> <li>• <a href="https://www.bipiz.org/en/csr-best-practices/sncf-contribution-to-a-more-circular-economy.html">https://www.bipiz.org/en/csr-best-practices/sncf-contribution-to-a-more-circular-economy.html</a></li> <li>• <a href="https://www.sncf.com/de/konzern/profil-und-kennzahlen/unternehmensportrait/wer-wir-sind">https://www.sncf.com/de/konzern/profil-und-kennzahlen/unternehmensportrait/wer-wir-sind</a></li> <li>• <a href="https://www.sncf.com/en/commitments/sustainable-development/leading-the-charge-for-the-planet">https://www.sncf.com/en/commitments/sustainable-development/leading-the-charge-for-the-planet</a></li> </ul>	

### FRIVEP initiative - recycling work wear into functional fabrics

Country: France	Organization: Société nationale des chemins de fer Français (SNCF)
<p>In 2016, SNCF initiated a cooperation with environmental NGO Orée. Together with industry partners and the support of several French ministries, they launched the recycling initiative FRIVEP in 2018. In January 2019, FRIVEP inaugurated the first sorting and recycling centre for work wear.</p>	
Implementation timeframe	Since 2016 (ongoing)
Responsible organizational unit	<ul style="list-style-type: none"> <li>• Initiated by the environment referents at SNCF (precisely: responsible supervisor and contact person is the circular economy</li> </ul>

	and waste referent in the sustainable development department of SNC)
Actions taken	<ul style="list-style-type: none"> <li>Objective: to recycle discarded work wear clothing into renewable functional fabrics, which are 100% recycled, recyclable and PFC-free functional</li> <li>After an experimental phase from 2018 to December 2019, FRIVEP inaugurated the first sorting and recycling centre for work wear in January 2019</li> </ul>
<b>Benefits</b>	
Economic	<ul style="list-style-type: none"> <li>Expected utilisation of discarded textiles of up to 150 tonnes in 2020</li> </ul>
Environmental	<ul style="list-style-type: none"> <li>Reduction of 21,500 kg of textile waste in pilot phase as a result of upcycling discarded work wear clothing</li> </ul>
Social	n/a
Sources:	
<ul style="list-style-type: none"> <li>SNCF (2017): Corporate Social Engagement Report 2017: SNCF – Delivering Useful, Open Mobility. Available at: <a href="http://medias.sncf.com/sncfcom/rse/bilanrse/CSR_Annual_Report_EN.pdf">http://medias.sncf.com/sncfcom/rse/bilanrse/CSR_Annual_Report_EN.pdf</a>.</li> <li><a href="http://www.circulary.eu/project/sympatex/">http://www.circulary.eu/project/sympatex/</a></li> <li><a href="https://www.ecologique-solidaire.gouv.fr/vetements-et-uniformes-professionnels-naissance-dune-filiere-recyclage">https://www.ecologique-solidaire.gouv.fr/vetements-et-uniformes-professionnels-naissance-dune-filiere-recyclage</a></li> <li><a href="http://www.oree.org/frivep.html">http://www.oree.org/frivep.html</a></li> </ul>	

### La Boutique Éco Platform – sharing and reusing non-needed business equipment

Country: <b>France</b>	Organization: <b>Société nationale des chemins de fer Français (SNCF Réseau)</b>
SNCF Réseau installed an internal Web-based platform on which SNCF Group employees can share, donate and exchange non-needed or very infrequently used business equipment instead of purchasing new materials. Intrapreneurs (from SNCF's own "intrapreneurial programme") designed the platform.	
Implementation timeframe	<ul style="list-style-type: none"> <li>Platform launched in June 2018</li> </ul>
Responsible organizational unit	<ul style="list-style-type: none"> <li>Procurers on every level of the SNCF Group</li> </ul>
Actions taken	<ul style="list-style-type: none"> <li>La boutique éco platform allows members to upload and search for non-needed business items across all SNCF Group member organizations, e.g. personal protective clothing and equipment, station furniture, office furniture, IT equipment, office supplies, tools and communication materials.</li> </ul>
<b>Benefits</b>	
Economic	<ul style="list-style-type: none"> <li>€ 473 204 of purchasing costs have been saved since the launch of the platform</li> </ul>
Environmental	<ul style="list-style-type: none"> <li>Reduced material consumption through the (further) use of existing equipment</li> </ul>

Social	<ul style="list-style-type: none"> <li>Employee empowerment to contribute to CE and enhanced communication between employees and different subsidiaries of SNCF Group</li> </ul>
Sources:	
<ul style="list-style-type: none"> <li><a href="http://garepartagee.sncf.com/lintrapreneuriat-chez-sncf/">http://garepartagee.sncf.com/lintrapreneuriat-chez-sncf/</a></li> <li><a href="https://laboutiqueeco.sncf.fr/comment-ca-marche/">https://laboutiqueeco.sncf.fr/comment-ca-marche/</a></li> </ul>	

## Resource protection through recycling and extended service life

Country: <b>Germany</b>	Organization: <b>Deutsche Bahn AG (DB)</b>
<p>DB's goal is to use raw materials as well and as sparingly as possible in order to protect natural resources. To achieve this goal the organisation pursues three main approaches: a high recycling rate, increased use of recycled materials and a longer service life of materials. The corporation also applies intelligent disposal management systems.</p>	
Implementation timeframe	<ul style="list-style-type: none"> <li>First DB sustainability report published in 2007 (measures were adopted at different starting points since then)</li> </ul>
Responsible organizational unit	<ul style="list-style-type: none"> <li>Different measures concern different business units of the DB Group <ul style="list-style-type: none"> <li>Reusing concrete ties: DB Bahnbau</li> <li>Fleet maintenance and revision: DB Fahrzeuginstandhaltung</li> <li>Other measures, such as usage of recycled paper, apply to all units</li> </ul> </li> </ul>
Actions taken	<p>Approach: Recycling and extending service life of products as long as possible</p> <ul style="list-style-type: none"> <li>Objective: reaching a recycling quota of 95% of all raw materials used by the end of 2020</li> <li>The target has already been achieved and even surpassed with a recycling rate of 98% in 2019</li> </ul> <ol style="list-style-type: none"> <li><b>Reusing concrete ties and ballast</b> <ul style="list-style-type: none"> <li>Re-integration and re-conditioning of wooden, concrete or bridge sleepers, complete track yokes, small irons or ballast within the DB track network if possible (every year around 200.000 sleepers are being reused or recycled this way)</li> <li>Recycling and usage as valuable construction materials elsewhere, e.g. as chippings in road construction</li> </ul> </li> <li><b>Expanding the service life of the fleet</b> <ul style="list-style-type: none"> <li>Successive modernization, redesign and technological revision of DB's ICE and IC fleet instead of new purchases</li> <li>Targeted production of individual spare parts via 3D printing to reduce consumption of raw materials</li> </ul> </li> <li><b>Use of recycled paper</b> <ul style="list-style-type: none"> <li>Since 2014, DB exclusively uses recycled printing and copy paper in its offices; reports are printed on 100% recycled paper certified with the Blue Angel certification</li> </ul> </li> <li><b>Disposal Management</b></li> </ol>

	<ul style="list-style-type: none"> <li>DB uses an IT tool to save and reuse as much waste as possible by documenting, managing and optimizing waste and recycling flows</li> </ul>
<b>Benefits</b>	
Economic	<ul style="list-style-type: none"> <li>DB saves up to 80% of material cost through modernization of trains instead of purchasing new fleets</li> <li>Using recycled paper saves resources, cutting electricity by up to 70% and water up to 60% and using almost no wood</li> </ul>
Environmental	<ul style="list-style-type: none"> <li>Reduced material consumption through modernization and recycling approaches</li> <li>Shorter transport distances through reuse of construction materials within the DB track system</li> </ul>
Social	n/a
Sources:	
<ul style="list-style-type: none"> <li>DB (2020). Sustainability Reports. Available at: <a href="https://www.deutschebahn.com/de/nachhaltigkeit/ueberblick/service_download/berichte_neu/">https://www.deutschebahn.com/de/nachhaltigkeit/ueberblick/service_download/berichte_neu/</a></li> <li><a href="https://www.deutschebahn.com/en/Ressource_efficiency-1212814">https://www.deutschebahn.com/en/Ressource_efficiency-1212814</a></li> <li><a href="https://www.bahnbaugruppe.de/bahnbaugruppe-de/spezialgewerke/recycling-424166">https://www.bahnbaugruppe.de/bahnbaugruppe-de/spezialgewerke/recycling-424166</a></li> <li><a href="https://gruen.deutschebahn.com/de/strategie">https://gruen.deutschebahn.com/de/strategie</a></li> <li><a href="https://gruen.deutschebahn.com/de/strategie/strategie-ressourcenschutz">https://gruen.deutschebahn.com/de/strategie/strategie-ressourcenschutz</a></li> <li><a href="https://www.deutschebahn.com/en/group/business_units?qli=true&amp;pageNum=0">https://www.deutschebahn.com/en/group/business_units?qli=true&amp;pageNum=0</a></li> </ul>	

### Sustainable gastronomy on trains

<b>Country:</b> Germany	<b>Organization:</b> Deutsche Bahn AG (DB)
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Through usage of sustainable products and measures for the reduction of food waste in staff and customer restaurants and bistros, DB aims to reduce food and resource waste within its service offers. DB cooperates with a waste disposal company to provide biogas plants with food leftovers from staff restaurants.

Implementation timeframe	<ul style="list-style-type: none"> <li>First DB sustainability report published in 2007 (measures were adopted at different starting points since then)</li> </ul>
Responsible organizational unit	<ul style="list-style-type: none"> <li>Subsidiary company of DB: DB Gastronomie GmbH</li> </ul>
Actions taken	<ol style="list-style-type: none"> <li><b>1. Production of biogas from food waste</b> <ul style="list-style-type: none"> <li>Food waste from DB-owned staff restaurants is collected and transferred for plants to produce biogas (cooperation with LOGEX) – biogas is utilized in combined heat and power plants where heat is generated that is used for heating or fed into the power grid</li> <li>Remaining product at the end of the fermentation process is used as organic fertiliser in agriculture</li> </ul> </li> <li><b>2. Sustainable practices and products in DB service provision</b> <ul style="list-style-type: none"> <li>Usage of reusable tableware in the staff restaurants</li> </ul> </li> </ol>

	<ul style="list-style-type: none"> <li>• “DB reusable cup” as an alternative to disposable cups for customers</li> <li>• Fair Trade products such as coffee/ tea are offered in the on-board bistros</li> <li>• Durable products are donated instead of thrown away when no longer needed, e.g. after a change in the range</li> </ul>
<b>Benefits</b>	
Economic	n/a
Environmental	<ul style="list-style-type: none"> <li>• Reduced food and plastic/ paper waste</li> <li>• Sustainable production of energy and organic fertiliser for agriculture out of food waste</li> </ul>
Social	n/a
Sources:	
<ul style="list-style-type: none"> <li>• <a href="https://gruen.deutschebahn.com/de/massnahmen/biogas">https://gruen.deutschebahn.com/de/massnahmen/biogas</a></li> <li>• <a href="https://gruen.deutschebahn.com/de/strategie/strategie-ressourcenschutz">https://gruen.deutschebahn.com/de/strategie/strategie-ressourcenschutz</a></li> <li>• <a href="https://www.deutschebahn.com/de/nachhaltigkeit/ueberblick/service_download/berichte_neu/">https://www.deutschebahn.com/de/nachhaltigkeit/ueberblick/service_download/berichte_neu/</a></li> <li>• <a href="https://www.deutschebahn.com/en/group/business_units?qli=true&amp;pageNum=0">https://www.deutschebahn.com/en/group/business_units?qli=true&amp;pageNum=0</a></li> <li>• <a href="https://www.deutschebahn.com/de/konzern/konzernprofil/Konzernunternehmen/dbgastronomie-1191960">https://www.deutschebahn.com/de/konzern/konzernprofil/Konzernunternehmen/dbgastronomie-1191960</a></li> </ul>	

<b>Modern raw materials management</b>	
<b>Country:</b> Austria	<b>Organization:</b> ÖBB Infrastructure AG (ÖBB)
<p>ÖBB reduced its consumption of raw materials by reusing and recycling building materials from about 300 to 400 active construction sites each year, enforcing a strict waste processing, and management system.</p>	
Implementation timeframe	<p>Different projects are implemented within different timeframes:</p> <ul style="list-style-type: none"> <li>• “Koralm” tunnel construction: 2009-2026</li> <li>• First sustainability report was published in 2006 (ongoing implementation of measures since then)</li> </ul>
Responsible organizational unit	<p>Different measures concern different business units of the ÖBB Infrastructure AG:</p> <ul style="list-style-type: none"> <li>• Recycling of building materials: Rail Equipment GmbH</li> <li>• Trainings: carried out by ÖBB Line Management and Asset Development Division of ÖBB Infrastructure AG</li> </ul>
Actions taken	<p><b>1. Reusing and recycling building materials and wastes</b></p> <ul style="list-style-type: none"> <li>• About 1,5 tonnes of building wastes (such as building rubble, wooden and concrete railway sleepers etc.) used to produce cement in 2017</li> <li>• Before assigning waste to a specific collector or treater, ÖBB carries out various chemical analyses comprising 60 parameters</li> <li>• Best practice example: Construction of the “Koralm” tunnel, which produced about 8.6 million tons of excavation material: 1.5 million tons were used immediately for the production of aggregates that then went into concrete production; 2.9 million tons were reused as backfill</li> </ul>

	<p>material for the new line (awarded with the 2nd place of the Austrian waste management prize "Phoenix 2016")</p> <ul style="list-style-type: none"> <li>• ÖBB transports non-reusable waste via train to a local waste incineration plant, where the waste is transformed into energy</li> </ul> <p><b>2. Training of staff members on waste management possibilities and regulations</b></p> <ul style="list-style-type: none"> <li>• ÖBB Line Management and Asset Development Division provided information on legal implications and implementation possibilities in waste disposal in over 250 training courses</li> </ul>
<b>Benefits</b>	
Economic	<ul style="list-style-type: none"> <li>• "Koralm" tunnel: approximately 1.2 million tons of tunnel excavation material are used directly on the construction site for concrete production (saves material procurement costs)</li> </ul>
Environmental	<ul style="list-style-type: none"> <li>• Usage of ÖBB waste in the waste incineration plant produces up to 74,200 MWh of electricity, which corresponds to the supply of around 21,000 households and saves 28 million litres of heating oil</li> </ul>
Social	n/a
<p>Sources:</p> <ul style="list-style-type: none"> <li>• ÖBB Nachhaltigkeitsbericht/ Sustainability Report 2017/18: <a href="https://konzern.oebb.at/de/nachhaltigkeit/nachhaltigkeitsberichte">https://konzern.oebb.at/de/nachhaltigkeit/nachhaltigkeitsberichte</a></li> <li>• <a href="https://konzern.oebb.at/de/nachhaltigkeit/ressourceneffizienz">https://konzern.oebb.at/de/nachhaltigkeit/ressourceneffizienz</a></li> <li>• <a href="https://konzern.oebb.at/de/nachhaltigkeit/ressourceneffizienz/weg-damit-das-zweite-leben-des-abfalls">https://konzern.oebb.at/de/nachhaltigkeit/ressourceneffizienz/weg-damit-das-zweite-leben-des-abfalls</a></li> <li>• <a href="https://konzern.oebb.at/de/nachhaltigkeit/nachhaltigkeitsberichte">https://konzern.oebb.at/de/nachhaltigkeit/nachhaltigkeitsberichte</a></li> </ul>	

<b>Ensuring a responsible and efficient value chain</b>	
<b>Country:</b> Switzerland	<b>Organization:</b> Swiss Federal Railways (SBB)
<p>To ensure a responsible and efficient value chain within the company, SBB implements various measures in the three areas of sustainable procurement, waste and recyclables management and life cycle assessment.</p>	
Implementation timeframe	<ul style="list-style-type: none"> <li>• 2018-2020 (objectives and implementation timeframe of current sustainability report)</li> </ul>
Responsible organizational unit	<p>Different measures concern different business units of the SBB:</p> <ul style="list-style-type: none"> <li>• Uniform waste management (Group-wide): Competence Center Waste Management (KPZ)</li> <li>• Procurement: <ul style="list-style-type: none"> <li>○ Technical driver for sustainability in procurement is the Group's Sustainability Department</li> <li>○ Strategies and measures are decided by highest body in SBB Purchasing</li> <li>○ Purchasing organizations of the Group and the divisions are responsible for implementation</li> <li>○ 2019: creation of additional coordination office in central purchasing</li> </ul> </li> <li>• Life Cycle Management: SBB Finance</li> </ul>

	<p>The Group's Sustainability Team and the Sustainability Departments of the divisions are strategically responsible for ensuring that a holistic life cycle approach is anchored at SBB</p> <ul style="list-style-type: none"> <li>○ Specialist departments are responsible for implementation</li> <li>○ 2018: creation of a specialist management team by SBB Finance to apply life cycle costing (LCC) in all divisions</li> </ul>
Actions taken	<p><b>1. Waste and recyclable materials management</b></p> <ul style="list-style-type: none"> <li>● All material movements are recorded centrally by the employees on site (this increases transparency and traceability in the cycle of specific product groups and facilitates their pooling, separation and sale of recyclable materials)</li> <li>● Project "Reusable Materials and Recycling": SBB offered certain recyclable materials on the market via an auction platform</li> <li>● resale@sbb: online shop for used railway products, e.g. SBB vehicles and sleepers can be purchased and reused on secondary or industrial tracks or for external usage</li> <li>● Consumption of plastic by end consumers: collection of PET bottles separately from other waste, in addition to paper and aluminium at larger stations</li> <li>● Renewed invitation to tender for Group-wide waste disposal from 2019 onwards: only a maximum of 25 transport kilometres can be billed per collection of the recyclables</li> </ul> <p><b>2. Sustainable Procurement</b></p> <ul style="list-style-type: none"> <li>● 44 SBB suppliers have completed a sustainability questionnaire from the EcoVadis initiative by 2018: evaluates, among other things, the suppliers' resource management and waste management - results are made available to buyers</li> </ul> <p><b>3. Life Cycle Analysis</b></p> <ul style="list-style-type: none"> <li>● Keeping valuable resources in circulation to minimise consumption and thus the amount of waste</li> <li>● Best Practice Example: Platforms with recycled asphalt at stations in Hauptwil and Kradolf (pilots for testing how high the recycled content in the asphalt can be in order to meet requirements in quality and service life, and whether the asphalt thickness of platforms can be reduced)</li> </ul>
<b>Benefits</b>	
Economic	<ul style="list-style-type: none"> <li>● SBB recycling centre has increased its additional revenue in 2018 due to good raw material prices, the sale of recyclable materials via online auctions, the consistent separation of quality levels and the pooling of larger quantities</li> <li>● Auctions of recyclable material achieved significantly higher prices (i.e. by about 15 percent) and increased transparency in the entire sales process</li> <li>● Renewed tender for waste disposal: disposal companies concerned sought regional transport partners: tender specification (max. 25 transport km) will reduce costs by 30 to 40 percent</li> </ul>

Environmental	<ul style="list-style-type: none"> <li>• Reduced CO<sub>2</sub> emissions through shortened transport distances of waste disposal</li> <li>• Recycled asphalt: conserves the natural resources of gravel and sand as the starting materials for asphalt and reduces the environmental impact of the production and transport of fresh asphalt: use of recycled asphalt can thus reduce environmental footprint over the entire life cycle by up to 25 percent</li> </ul>
Social	n/a
Sources:	
<ul style="list-style-type: none"> <li>• SBB Geschäfts- und Nachhaltigkeitsbericht 2018: <a href="https://company.sbb.ch/de/ueber-die-sbb/verantwortung/nachhaltigkeit-bei-der-sbb.html">https://company.sbb.ch/de/ueber-die-sbb/verantwortung/nachhaltigkeit-bei-der-sbb.html</a></li> <li>• <a href="https://sbbresale.ch/kreislaufwirtschaft-dient-der-ganzen-bahnbranche/">https://sbbresale.ch/kreislaufwirtschaft-dient-der-ganzen-bahnbranche/</a></li> </ul>	

### Sustainable sleepers produced from recycled and end-of life materials

Country: Italy	Organization: Greenrail
Greenrail produces sleepers covered with a blend of End-of-Life Tyres (ELTS) and recycled plastic. The use of innovative, circular economy materials makes the sleepers more durable and reduces each sleeper's resource consumption.	
Implementation timeframe	<ul style="list-style-type: none"> <li>• Production since November 2012</li> </ul>
Responsible organizational unit	n/a
Actions taken	<ul style="list-style-type: none"> <li>• Sustainable sleepers: outer cover made of a blend of ELTs and recycled plastic, inner core of pre-stressed, reinforced concrete, to replace outdated concrete railway sleepers</li> </ul>
<b>Benefits</b>	
Economic	<ul style="list-style-type: none"> <li>• Reduction of the maintenance cost through less pulverization of the ballast und the sleepers and longer lifespan of the sleepers</li> <li>• Traceability of each sleeper due to RFID technology enables documentation and provenance of materials</li> </ul>
Environmental	<ul style="list-style-type: none"> <li>• Recovery and reuse of tonnes of plastic and ELTS: 1670 Greenrail sleepers (equal to 1 km of rail line) contribute to the recovery of up to 35 tonnes of ELTs and plastic from urban waste</li> <li>• Reduction of vibration and noise levels deriving from railway traffic</li> </ul>
Social	n/a
Sources:	
<ul style="list-style-type: none"> <li>• <a href="https://circulareconomy.europa.eu/platform/en/good-practices/greenrail-innovative-eco-sustainable-railway-sleepers">https://circulareconomy.europa.eu/platform/en/good-practices/greenrail-innovative-eco-sustainable-railway-sleepers</a></li> <li>• <a href="http://www.greenrailgroup.com/en/sustainability/">http://www.greenrailgroup.com/en/sustainability/</a></li> </ul>	



## Railway sleepers made from recycled plastic

Country: <b>Australia</b>	Organization: <b>Integrated Recycling</b>
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The railway sleepers made from recycled plastic sourced in Australia, including vineyard covers and cotton bale wraps. They are the result of nearly four years of research and product development led by Integrated Recycling and Monash Institute of Railway Technology.

Implementation timeframe	<ul style="list-style-type: none"> <li>June 2019</li> </ul>
Responsible organizational unit	n/a
Actions taken	<ul style="list-style-type: none"> <li>Sustainable sleepers: 190 railway sleepers that are 85 % made from recycled plastic are installed at Richmond station in Melbourne for 18-month trial.</li> </ul>

### Benefits

Economic	<ul style="list-style-type: none"> <li>Lifespan of up to 50 years, which is three times longer than traditional timber sleepers</li> <li>Manufactured at half the cost of traditional timber sleepers and require less maintenance</li> </ul>
Environmental	<ul style="list-style-type: none"> <li>Reduction of the need for timber resources and of concrete production (the second-largest carbon emitter in the world)</li> <li>The sleepers require less energy and resources to manufacture, hence producing significantly less greenhouse gases</li> <li>For every kilometre of track installed with the sleepers, 64 tonnes of plastic have been recycled</li> </ul>
Social	n/a

#### Sources:

- <https://www.sustainability.vic.gov.au/About-us/Latest-news/2019/06/25/03/36/Recycled-plastic-railway-sleepers-installed-at-Richmond-Train-Station#:~:text=In%20a%20first%20for%20Victoria's,sleepers%20made%20from%20recycled%20plastic.&text=The%20sleepers%20require%20far%20less,longer%20than%20traditional%20timber%20sleepers>
- <https://wastemanagementreview.com.au/recycled-sleepers-richmond/>
- <https://www.railway-technology.com/news/railway-sleepers-recycled-plastic-richmond-station/>
- <https://www.createdigital.org.au/one-company-recycling-plastic-waste-railway-sleepers/>
- <http://www.integratedrecycling.com.au/railway-sleepers/>

## High speed line in the UK

Country: <b>United Kingdom</b>	Organization: <b>High Speed Two (HS2) Ltd (high speed railway line)</b>
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H2S is a low carbon high-speed line in the UK, providing rail capacity across the kingdom to cope with increasing passenger numbers. It is considered to be Europe's largest infrastructure project. The project's goal is to deliver value and follow the principle of retaining and recapturing value in a circular economy. In order to deliver this goal, HS2 follows its own circular economy principles, which will be monitored throughout the project (see actions taken).

Implementation timeframe	<ul style="list-style-type: none"> <li>● Launch: 2012</li> <li>● Currently under construction (Phase 1: 2029 – 2035)</li> </ul>
Responsible organizational unit	n/a
Actions taken	<p>HS2 Circular Economy Principles:</p> <ul style="list-style-type: none"> <li>● Keep resources in use for as long as possible</li> <li>● Recover and regenerate resources at the end of use</li> <li>● Keep resources at their highest quality and value at all times.</li> </ul> <p>Concrete actions:</p> <ul style="list-style-type: none"> <li>● Reuse of 90% of the 128m tonnes of excavated material along the route</li> <li>● Recovering material resources (e.g. structural steel or felled timber), during demolition and site clearance</li> <li>● Embedding of CE principles with HS2 suppliers</li> </ul>
<b>Benefits</b>	
Socio-economic	<ul style="list-style-type: none"> <li>● Creation of over 7,000 jobs (04/2019)</li> <li>● HS2 is expected to generate around £92 billion in benefits to the UK economy (04/2019)</li> <li>● Funding of local community projects</li> </ul>
Environmental	<ul style="list-style-type: none"> <li>● Carbon dioxide emissions: <ul style="list-style-type: none"> <li>○ Per passenger-kilometer: Estimated to be 8 grams for high-speed rail, in contrast to 22 grams for conventional intercity rail</li> <li>○ Low carbon for long distance travel: emitting 17 times less carbon than the equivalent domestic flight and 7 times less carbon than the equivalent car journey</li> </ul> </li> </ul>
<p>Sources:</p> <ul style="list-style-type: none"> <li>● <a href="https://medium.com/circulatenews/applying-the-circular-economy-to-high-speed-railway-8914da6745aa">https://medium.com/circulatenews/applying-the-circular-economy-to-high-speed-railway-8914da6745aa</a></li> <li>● <a href="https://www.hs2.org.uk/what-is-hs2/">https://www.hs2.org.uk/what-is-hs2/</a></li> <li>● <a href="https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/657833/hs2_circular_economy_principles.pdf">https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/657833/hs2_circular_economy_principles.pdf</a></li> <li>● <a href="https://assets.hs2.org.uk/wp-content/uploads/2019/08/14094931/our-story-and-key-facts.pdf">https://assets.hs2.org.uk/wp-content/uploads/2019/08/14094931/our-story-and-key-facts.pdf</a></li> <li>● <a href="https://www.gov.uk/government/organisations/high-speed-two-limited">https://www.gov.uk/government/organisations/high-speed-two-limited</a></li> </ul>	