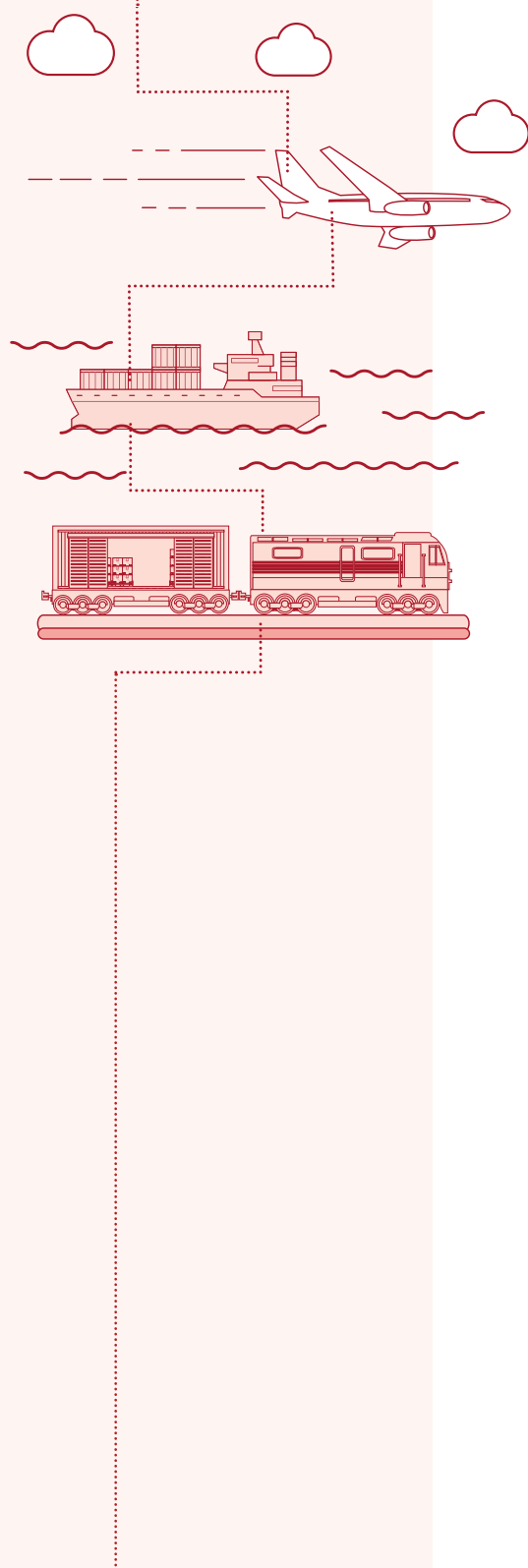


Innovative International Cooperation for Climate

Reconciling urgent action and transformational change



FREIGHT TRANSPORT

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INTRODUCTION

Transport emissions represent about 15% of total greenhouse gas (GHG) emissions, equivalent to 9 GtCO₂eq each year. Transport-related emissions have shown continuous growth since 1990 at an annual average of 2%, increasing faster than for any other end-use sector (IPCC, 2022b). Freight emissions account for about 40% of all transport GHG emissions (ITF, 2021a; SLOCAT, 2021a) and are increasing. This is mainly due to accelerating demand and global supply chains, which could lead to almost a tripling of tonne-kilometres by 2050 (ITF, 2021a), and due to a strong fossil fuel dependency.

Current medium-term objectives and strategies for freight as reported in Nationally Determined Contributions (NDCs) under the United Nations Framework Convention on Climate Change, are far from sufficient. Recent analyses highlight that freight transport measures are largely overlooked and very limited compared to passenger transport actions (ITF, 2021b; SLOCAT, 2021b), while reinforcing sectoral details and granularity should be a priority (Gunfaus & Waisman, 2021; Hermwille, Obergassel, & Fragkos, 2022). Most freight decarbonization measures focus on the development of new technologies, such as advanced biofuels, electric vehicles and new digital technologies, to improve energy efficiency and reduce emissions. They neglect, however, organizational changes and related actions including the development of infrastructure and incentives for rail and waterways, without mentioning specific actions to lower the transport demand, either by shortening supply chains or reducing the number of deliveries and tonnes transported inefficiently (SLOCAT, 2021b).

However, the latest IPCC Special Report on Global Warming of 1.5°C and the Sixth Assessment Report highlight that reaching carbon neutrality by the mid-century will require unprecedented, rapid, and far-reaching systemic transitions in energy systems but also in land, urban, infrastructural and industrial systems, and imply deep emission reductions in all sectors. To reverse the freight sector's current emission trend and

to achieve structural reductions, the IPCC states that technological innovations will not be sufficient and that complementary organizational transformations are required. Such organizational changes could enable a systemic shift that would bring about a reduction in tonnes transported and kilometres travelled, as well as a reduction in the role of road freight in logistics, while facilitating the expansion of alternative low-carbon vehicles and fuels.

The following section shows examples of organizational changes, provided by research members of the Deep Decarbonization Pathways network as they are - or could be - implemented in their countries and that could influence freight-related emissions. These evidences are based on national analyses of the net-zero transition and on work around long-term low-emission development scenarios (Gonçalves, D. N. S. et al., 2022; Briand et al., 2019; Gupta & Dhar, 2022; Emodi, N.V. et al., 2022; Ahjum F. et al., 2020).

EXAMPLES OF NATIONAL ACTIONS AIMING AT ORGANIZATIONAL CHANGES FOR FREIGHT DECARBONIZATION

BRAZIL THE USE OF FREE-FLOW ROAD TAXATION SYSTEMS AS A MECHANISM TO SUPPORT A MODAL SHIFT FOR LONG-DISTANCE TRANSPORT AND URBAN FREIGHT DECARBONIZATION

Law No. 14,157, approved in June 2021, outlines the conditions for the introduction of toll collections on highways and urban streets using free-flow systems.

Since then, several ongoing projects such as BR 101 and BR 470, connecting the states of Rio de Janeiro and São Paulo, as well as the inland areas of the state of Rio Grande do Sul, have been working towards implementing tolls in this new format. The National Land Transport Agency (ANTT) intends to adopt the technology in all new and renewed concessions, as this would reduce implementation costs (NSLT, 2022). Currently, many highways in Brazil are toll-free, but where tolls exist, payment collection systems are manual or electronic (both with physical barriers), causing long queues and increased delivery times (CNT, 2020). In an extensive implementation scenario applied to the 25,000km of Brazil's highways that experience the heaviest volumes of freight traffic (ANTT, 2023), the cost of road freight for long-distance transport would be increased. This would provide an incentive for cargo consolida-

tion, for the reduction of empty trips and potentially the increased use of rail freight, while at the same time decreasing congestion.

Moreover, the current outdated toll collection system would be impossible to implement at the city level, while a free-flow system could facilitate the development of city tolls. Brasília, the country's capital, is currently analysing the introduction of a free-flow system as one of the mitigation measures supporting the development of a low-emission zone in the current decade. The city aims to limit the use of individual motorized vehicles (particularly the more polluting cars) in specific congested areas, while also creating new loading and unloading zones in these areas, with a focus on energy-efficient freight vehicles. This example is expected to inspire other Brazilian cities to embrace green low-emission zones as a mitigation tool, an aspect that has been neglected in the current version of Brazil's NDC. The measure has the potential to change the use of urban space, while encouraging the adoption of more energy-efficient modes.

BRAZIL ARE TRAVEL DISTANCES BEING REDUCED? THE CURRENTLY UNKNOWN IMPACT OF TAX REFORMS ON BRAZILIAN LOGISTICS FLOW PATTERNS

According to our analysis, for some supply chains, shortening delivery distances between consumption and production could support Brazilian decarbonization. Such systemic change would require action on the taxation system, for example, by incentivizing industries to move their locations nearer to centres of consumption.

This resonates with an ongoing parliamentary discussion about Tax Reform (Bill No. 45/2019),

which outlines revisions to consumption taxes. Under the new law, five taxes (IPI, PIS, COFINS, ICMS, and ISS) have been merged into a dual system: a federal Goods and Services Contribution (CBS) and a Goods and Services Tax (IBS) for states and municipalities. One of the major amendments to the existing legislation is the shift of the tax base. While the tax is currently based on the product and levied in the state of origin,

it has been suggested that the tax could be levied in the destination state. This modification would directly affect the ability of states to use tax incentives for specific sectors to attract investments (Federal Audit Court, 2023). However, it is important to evaluate the equilibrium between employment generation and revenue collection in the affected states.

According to the proposal, exporting enterprises would be exempt from CBS payments, providing advantages to the Brazilian agricultural sector and some segments of the industrial sector. This situation could therefore strengthen the main agricultural producing states, reinforcing the existing logistical corridors, especially those designated for exports.

In addition, the impacts on national trends in the location of industries remain uncertain. Beyond export-oriented enterprises, one possibility is that more production facilities will be concentrated around areas of high industrialization and consumption, to the detriment of more remote regions. This would potentially shorten the journeys made to supply these centres, while lengthening journeys to supply more remote states. Evaluating the exact impact in terms of transport activity (tonne-kilometres) will depend on the concentration factor expected and the localization of these centres; additional simulations and analysis will be necessary.

FRANCE DECARBONIZING PRODUCTION AND FREIGHT REQUIRES THE DEVELOPMENT OF LOCAL AND CIRCULAR ECONOMIES, AND AN INCREASE IN FREIGHT ON NON-ROAD MODES.

France has recently established a General Secretary for Ecological Planning, which has been responsible for publishing a long-term plan for the decarbonization of all private and public sectors (SGPE, 2023), which confirmed some of the key structural changes that must be implemented for freight, as demonstrated in previous research (Briand et al., 2019). It is based on a four-pronged approach: virtuous logistics, lower demand, more non-road modes, cleaner road transportation.

A paradigm has shifted: freight transport emissions are now being tackled from the perspective of production and logistics, in a chapter called "better producing". Regarding production, consumption and supply chains, the plan includes the objectives to develop a circular economy to produce and transport less, to produce and transport less raw materials by improving the durability of products and the recycling and reuse of second-hand products, to produce and transport less waste, and therefore to change our production processes and consumption behaviours. It also highlights the need to develop local consumption and supply. Finally, regarding the

organization of logistics, the plan includes objectives to increase the share of rail transport from 11% in 2021 to 18% in 2030 (an 80% increase of rail freight traffic in 7 years), but also to improve logistics and energy efficiency, and to strongly encourage the development of battery electric HGVs and LCVs.

Unfortunately, several of these areas either lack clear corresponding policy instruments, or a credible assessment of such tools. To develop and implement additional policies, the role of industry is critical, in terms of producers, consumers, and transport service providers. The commitment of industry is directly aligned with the credibility of public policies, which in turn will have to contend with the macroeconomic impact of the ecological transition and its political fallout. It is interesting to note that the French Prime Minister has asked for a report on this specific issue (Pisani-Ferry, Mahfouz, 2023).

FRANCE INFORMING CONSUMERS ABOUT THE REPAIRABILITY AND LONGEVITY OF PRODUCTS TO REDUCE TONNES TRANSPORTED AND KILOMETRES TRAVELLED

In 2020, France adopted the anti-waste law for a circular economy (Law AGEC, 2020) which aims to accelerate the shift of the French production and consumption model to reduce waste, to limit the use of natural resources, and to lessen the impact of economies on biodiversity and climate. For example, this new law has introduced an obligation for producers and distributors to use a repairability index to inform consumers about how easily a product can be repaired. This index, which is mandatory for certain products, takes into account whether a product can be disassembled, whether producers provide advice related to its use, maintenance and repairability, and whether producers make spare parts available at acceptable prices. In 2024, this repairability index

will evolve to a durability index, which will include other dimensions such as product reliability and robustness, and will cover an additional range of products (Repairability Index, 2023).

Combined with other policies of the AGEC law that support the development of local production-consumption ecosystems, this information policy could contribute to a structural change in the way we produce and consume. If product lifespans are extended, or if products can be fixed by buying spare parts, and if local consumption ecosystems emerge, this could lead to a reduction in the overall tonnes of products transported, as well as a shortening of the distances between production, consumption and repair sites.

INDIA POLICIES TO SHIFT FINANCING FROM ROAD INFRASTRUCTURE TO RAILWAYS

With the goal of achieving self-sufficiency in meeting economic demand and hence enhancing its export capacity, India is likely to witness rapid growth in freight transport. India has experienced a steady shift from rail to road over the last three decades, with road freight representing today about 70% of overall goods transport (Ministry of Railways, 2020).

However, according to our analysis, reducing emissions from freight transport along with removing the current inefficiencies in the logistics sector will require an urgent transformational shift to develop an efficient multimodal system, in which rail will have to play a more significant role.

To achieve this shift, a change in current planning and financing trends is required, trends that have driven huge growth in highway construction of more than 300%, compared to limited growth in rail construction of only 5%. These trends have also restricted the development of last mile connectivity for rail freight, which is necessary for the transition, and always prioritized passenger transport over freight. Policy interventions

are therefore necessary to bring about such a systemic change in freight transport.

There are two areas where the government can intervene to facilitate a modal shift towards rail. First, there are hardly any regulations around multimodal transport, such as uniform rules that apply from the origin of freight to its destination. Even though the national logistics policy (Prime Minister's Office, 2022) provides the initial direction, there is a gap around governance mechanisms for seamless connectivity across all modes, such as real time information on the movement of goods and last mile delivery facilities. Second, current financing trends place insufficient focus on the transport capacity of rail, particularly the cross subsidizing of passenger transport, thus leading to an overburdened and outdated rail network. Hence, there is a need to provide finance support through innovative investment mechanisms for developing rail technology and expanding rail capacity.

NIGERIA SETTING NEW GOVERNANCE AND INVESTMENT RULES TO DEVELOP RAIL FREIGHT AND LIMIT THE DEPENDENCY ON ROAD FREIGHT

Nigeria's freight transport is dominated by road transport, which represents 99% of goods traffic. This heavy reliance on road transport has led to issues such as traffic congestion, infrastructure degradation, and high emissions. In Nigeria, the rail network has historically been underutilized and underdeveloped, and according to our national analysis, this must change (Akujor C.E. et al., 2022; Emodi N.V. et al., 2022).

First, central government should take the lead in the planning process and prioritize network routes that maximize economies of scale for the country and enable regional connections with neighbouring countries. This could allow Nigeria to develop major production corridors and enhance its role in regional trade partnerships. Such centralized planning would prevent the emergence of a fragmented and inefficient network, which is likely to result if regional politics and decisions are the main drivers. However, regional and central government should join forces to reduce regional security threats, which have been a barrier to the development of an efficient national railway network and service, particularly in the northeast, and which constitute a potential risk for southern coastal lines.

Second, a new framework law for rail development should be developed with the best-in-class standards to attract investments, to ensure safety and efficient operations, as well as to support

national development. For example, the government could open railway investment opportunities to private and international investors through public private partnerships. This could attract new financing and encourage competition between Nigerian actors and the foreign private sector. However, to ensure rail projects contribute to inclusive and sustainable development, the rules governing investments should set some obligations for private investors to employ local workers and companies for construction, but also to train workers to develop long-term skills for operating and maintaining infrastructure. Furthermore, national companies should remain within the project structure to allow some level of technology transfer. In addition to the direct impacts of new rail investment, the revitalization of the rail system can bring benefits and jobs to upstream industries, and also to manufacturing and logistics industries.

Finally, in terms of governance, a new framework law must define a key role for the central state in the planning process, as mentioned above, but should also offer opportunities for broader inclusive governance. For example, a new rule could establish a national obligation to reach a consensus regarding large-scale projects, to support the participation of Nigeria's indigenous peoples in national development and the deep decarbonization of the transport sector.

SOUTH AFRICA CHANGING THE GOVERNANCE OF RAIL INFRASTRUCTURE AND ASSETS IS A KEY PRIORITY TO ENABLE THE DEVELOPMENT OF RAIL FREIGHT

Shifting road freight to rail has the largest potential to decarbonize freight transport in South Africa in the short, medium and long terms. The much more challenging systemic transformation to achieve this shift relies on our capacity to implement existing official policies announced in 2022, namely the White Paper on National Rail Policy (Department of Transport of South Africa, 2022). The core policy is to open state-owned railway infrastructure to all train opera-

tors, state and privately owned. This is explicitly not a privatization of the industry but a concessioning out of severely underutilized track and rolling assets to operators that successfully bid to operate concessions (Trollip, 2022).

According to our analysis, opening the rail system to private train operators will be a major systemic transformation because there has been conflict within the tripartite ruling alliance, and hence in the ANC-led government for more than 30

years about the roles of state-owned enterprises and the private sector. This policy has become necessary because of the ongoing and deteriorating performance of the state-owned monopoly, Transnet, to the point of collapse, which has been confirmed by the National Planning Commission (NPC) after an in-depth investigation into Transnet (NPC, 2020).

A special department in the Presidency has been established to fast-track implementation but has encountered a challenging implementation environment. Indeed until very recently, allowing privately-owned trains onto the state-owned monopoly railway system was against the overarching policies of government and the ANC, which labelled any such move as privatization.

CONCLUSIONS

These country-specific examples highlight four different organizational shifts and related examples of enabling conditions that must be established to bring about deep reductions in freight transport emissions (see **Table 1**).

Table 1. Four organizational shifts and related examples of enabling conditions

Organizational shifts	Enabling conditions	Country examples
Producing and consuming sustainably	<ul style="list-style-type: none"> • New governance to allow cross-cutting measures between energy, transport, and industrial systems • Consumer information about reparability and product lifetimes • Involvement of large private industries to allow effective policies on logistics 	France
Producing goods closer to consumers	<ul style="list-style-type: none"> • Adapted production tax; 	Brazil
Developing more and better railway infrastructure, integrated into the logistics organizations	<ul style="list-style-type: none"> • Shifting road infrastructure finance to rail infrastructure • Multimodal logistics reforms to standardize transport regulations across national regions • Rail governance reforms centralizing infrastructure planning decisions and opening infrastructure finance to private and foreign investors • Involving large private industries to allow effective policies on logistics • Involving indigenous peoples to allow appropriation and adapted infrastructure development 	India Nigeria
Reinforcing the competitiveness of rail services in terms of costs, time and quality compared to road services	<ul style="list-style-type: none"> • Revised road taxation systems; • Rail governance reforms opening access to railway infrastructure to private rail freight service operators 	Brazil South Africa

HOW INTERNATIONAL COOPERATION COULD SUPPORT THE IMPLEMENTATION OF THESE ORGANIZATIONAL CHANGES

The effective implementation of the above-mentioned organizational changes identified as crucial for the decarbonization of freight transport largely depends on national actions and policies. However, international cooperation could play an important role in catalysing and accelerating these changes. Specific attention should be given to structured experience-sharing on best practice policy-making between countries, organizing technical assistance, directing international finance towards tangible industries and transport infrastructure, and modifying the contents of commercial and trade agreements (see **Table 2**).

In all these examples, the critical innovation lies in approaching cooperation in a way that directly supports national development and net-zero transformations, taking the diversity of country-specific sociocultural, economic and policy contexts into account.

This requirement forces a revisiting of conventional approaches to the different building blocks of cooperation listed above:

- Knowledge sharing should be organized around specific challenges and opportunities of industrial organization as emerging from the countries' experiences and the process should allow entering into the details of possible solutions, as opposed to skimming at the surface.
- Technical assistance should be demand-driven, i.e. primarily organized around the specific gaps identified by countries for their organizational transformations, as opposed to a more conventional supply-side approach triggered by technical assistance offers.
- Finance discussions should focus less on the overall perspective of financing flows, and instead start from the consideration of national needs for infrastructure changes

Table 2. Four organizational shifts and related examples of cooperation tools

Organizational shifts	Experience sharing on policies	Technical assistance	Financing	Trade requirements
Producing and consuming sustainably	<ul style="list-style-type: none"> • producer responsibility for the longevity and reparability of products, • consumer information 	<ul style="list-style-type: none"> • planning and adaptation of sustainable production processes 	<ul style="list-style-type: none"> • more sustainable industrial manufacturing processes 	<ul style="list-style-type: none"> • reparability, longevity and recyclability of products
Producing goods closer to consumers	<ul style="list-style-type: none"> • local sourcing mandates, • tax incentives based on local content of products 	*	<ul style="list-style-type: none"> • industries enabling local supply of semi-finished goods and alternative raw materials 	<ul style="list-style-type: none"> • local content of production • social and economic conditions for workers to favour social development • taxes on production to avoid fiscal competition
Developing more and better railway infrastructure, integrated into the logistics organizations	<ul style="list-style-type: none"> • planning and public consensus 	*	<ul style="list-style-type: none"> • rail, multimodal and logistics infrastructures 	<ul style="list-style-type: none"> • regional rail interconnection and interoperability associated to regional trade
Reinforcing the competitiveness of rail services in terms of costs, time and quality compared to road services	<ul style="list-style-type: none"> • rail privatization and concessioning 	<ul style="list-style-type: none"> • rail operations and system optimization 	*	<ul style="list-style-type: none"> • technology transfer of innovative technologies reducing operation time and costs

*Blank squares are not an indication that relevant tools do not exist, just that no example has been provided.

in the industrial and transport sectors that are consistent with organizational transformations. This would help secure adequate finance flows towards such infrastructure and encourage the discussion to focus on the country-specific and infrastructure-specific financing barriers and solutions.

- Trade and industrial cooperation should explicitly consider the impact on freight transport emissions to support trade agreements compatible with the development of regional, continental and sustainable industrial value chains and associated logistics, a dimension largely overlooked in conventional trade agreements.

BIBLIOGRAPHY

- Ahjum, F. et al. (2020). A low carbon transport future for South Africa: Technical, economic and policy considerations. Policy Paper, Climate Transparency.
- Akujor, C. E., Uzowuru, E. E., Abubakar, S. S., & Amakom, C. M. (2022). Decarbonisation of the Transport Sector in Nigeria. *Environmental Health Insights*, 16, 11786302221125039.
- ANTT . (2023). National Land Transport Agency (2023). https://portal.antt.gov.br/resultado/-/asset_publisher/m2By5inRuGGs/content/id/811867
- Briand et al. (2019). Deep decarbonization pathways of freight transport in France, Descriptive Report, IDDRI.
- Chen, Y. (2018). China's Role in Nigerian Railway Development and Implications for Security and Development. United States Institute of Peace.
- CNT. (2020). CNT – National Confederation of Transport (2020). Transport in motion. New toll payment technologies. [Online] Available at <https://cdn.cnt.org.br>. Accessed on 21 October 2023.
- Department of Transport of South Africa. (2022). White Paper on National Rail Policy. March 2022.
- Emodi, N. V., Okereke, C., Abam, F. I., Diemuodeke, O. E., Owebor, K., & Nnamani, U. A. (2022). Transport sector decarbonisation in the Global South: A systematic literature review. *Energy Strategy Reviews*, 43, 100925.
- Federal Audit Court (2023). Results of the Working Group on Tax Reform. [Online] Available at <https://12.senado.leg.br>. Accessed on October 21, 2023.
- Gonçalves, D. N. S., Goes, G. V., D'Agosto, M. de A., & La Rovere, E. L. (2022). Development of Policy-Relevant Dialogues on Barriers and Enablers for the Transition to Low-Carbon Mobility in Brazil. *Sustainability (Switzerland)*, 14(24), 1–17. <https://doi.org/10.3390/su142416405>
- Gunfaus, M. T., & Waisman, H. (2021). Assessing the adequacy of the global response to the Paris Agreement: Toward a full appraisal of climate ambition and action. *Earth System Governance*, 8, 100102. <https://doi.org/10.1016/j.esg.2021.100102>
- Gupta, D., & Dhar, S. (2022). Exploring the freight transportation transitions for mitigation and development pathways of India. *Transport Policy*, 129, 156–175.
- Hermwille, L., Obergassel, W., & Fragkos, P. (2022). Ensuring an Effective Global Stocktake. *NDC Aspects Project*.
- IPCC. (2022b). Contribution of Working Group III to the Sixth Assessment Report of the Intergovernmental Panel on Climate Change, Summary for Policymakers. *Cambridge University Press*. <https://doi.org/10.1017/9781009157926.001>
- ITF. (2021a). *ITF Transport Outlook 2021*. OECD. <https://doi.org/10.1787/16826a30-en>
- ITF. (2021b). Transport CO₂ and the The Innovative Landscape Paris Climate Mobility Agreement : The Case of We Mobility as a Later ? Service Where Are Six Years A Summary. *OECD*. Retrieved from <https://www.itf-oecd.org/sites/default/files/docs/transport-co2-paris-agreement-six-years-later.pdf>
- Law AGE. (2020). <https://www.ecologie.gouv.fr/loi-anti-gaspillage-economie-circulaire>
- Ministry of Railways. (2020). National Rail Plan India Draft Final Report. Ministry of Railways, Government of India. Retrieved from. <https://indianrailways.gov.in/NRPDraftFinalReportwithannexures.pdf>
- NPC. (2020). POSITION PAPER: The Contribution of SOEs to Vision 2030: Case studies of Eskom, Transnet and PRASA. South African National Planning Commission (NPC).
- NSLT. (2022). Ministry of Infrastructure. National Secretariat of Land Transport (2022). AIR Report. [Online] Available at <https://gov.br>. Accessed on October 21, 2023.
- Pisani-Ferry J. and S. Mahfouz (2023). Les incidences économiques de l'action pour le climat, France Stratégie, mai 2023.
- Prime Minister's Office. (2022). PM launches National Logistics Policy. Retrieved from <https://pib.gov.in/Pressreleaseshare.aspx?PRID=1860192>
- Repairability Index. (2023). <https://www.ecologie.gouv.fr/indice-reparabilite>
- SGPE (2023). Mieux agir, la planification écologique – synthèse du plan. Secrétariat Général à la Planification Ecologique.
- SLOCAT. (2021a). SLOCAT Transport and Climate Change Global Status Report. Tracking Trends in a Time of Change: The Need for Radical Action Towards Sustainable Transport Decarbonisation About the SLOCAT Partnership, 365.
- SLOCAT. (2021b). Climate Strategies for Transport: An Analysis of Nationally Determined Contributions and Long-Term Strategies, (December). Retrieved from www.slocat.net/ndcs
- Trollip, H. (2022). Barriers and Enablers of Ambitious Decarbonization Action in the Freight Transport Sector at the National Level (Unpublished draft Dec 2022, 37pp).



The Deep Decarbonization Pathways initiative helps global and national decision-makers take actions towards a deeply decarbonized world with drastically reduced inequalities. It is an international collaboration of experts, who share common scientific methods to elaborate robust analyses and engage with stakeholders. The DDP is an initiative of IDDRI.

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