

Environmental performance assessment of the transport sector in the European Union

Verão com Ciência

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Resumo

Reducing the European Union (EU) transport sector's pressure on the environment is critical to achieve long-term sustainability. This study evaluates the environmental performance of the transport sector in 28 EU countries, from 2015 to 2017, towards a more sustainable mobility by using composite indicators (CI). The assessment was made through the aggregation of 7 sub-indicators into a CI using a DEA approach. The results indicate that the EU countries had almost no variation on their transport environmental performance in these 3 years analyzed.

Objetivos

Measure and evaluate the environmental performance of the transport sector in the EU-28 countries, from 2015 until 2017, towards the policy agenda established in strategic documents. Identify relevant sub-indicators of transport sustainability. Show the usefulness of a DEA-based model, the Benefit of the Doubt (BoD) model, in assessing the relative environmental performance of the EU countries through the aggregation of sub-indicators data into a CI. Identify the sector areas that need more improvement.

Metodologia

The 7 sub-indicators used to evaluate the EU transport sustainability performance were based on literature review on related works and the interest to incorporate important targets related to the EU's White Paper (Roadmap) and the Sustainable Development Goals. The model used to determine the weights to aggregate the sub-indicators into the CI is variant of the BoD model with virtual proportional weights restrictions, as proposed by Färe et al. (FKHM).

Resultados

- The average CI result of the EU countries in the three years was of 0.591. It decreased 3% in 2016 and by 2017 was 1.17% below 2015 levels.
- The assessment identified 9 efficient units: Denmark (in 2017), Latvia (in 2015), Hungary (in 2015, 2016 and 2017), Netherlands (in 2015 and 2017), Romania (in 2015) and Sweden (in 2017).
- The highest improvements in the CI score during the years analyzed were observed in Spain, Greece and Sweden, which, in 2017, increased by 22%, 14% and 13% above 2015 levels, respectively.
- Estonia, Ireland, Cyprus and Malta were the most inefficient countries.

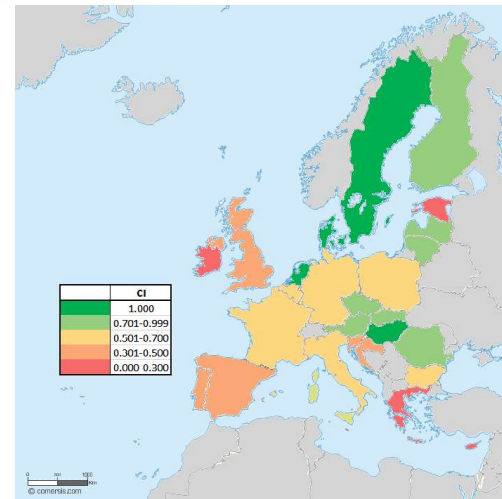


Fig.1 – Map of the countries CI result in 2017.

Figure 2 shows the results of using the efficient units performance on each sub-indicator as benchmark and comparing the results to the inefficient countries.

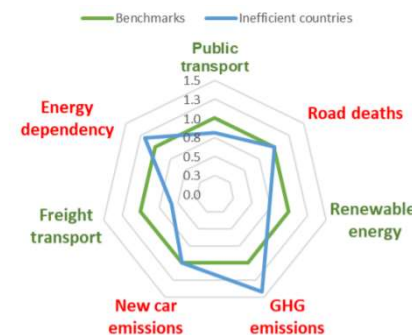


Fig.2 - Comparison between benchmarks and inefficient countries.

With this analyse it is possible to notice the areas where the inefficient countries need improvement by setting out policies and/or redefine output standards. Most of the work to improve transport sustainability should be done by drastically reducing the greenhouse gas emissions from fossil fuel, increasing the share of freight transport that uses rail and waterways and also the share of transport energy from renewable sources.

Conclusão

Based on the results achieved, it is possible to conclude that, in general, the EU countries had almost no variation on their transport environmental performance: by 2017 had a value 1.17% lower than 2015. This result points out that EU countries should make efforts to enable them to develop and strengthen their ability towards sustainability.

Bibliografia

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